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1 Purpose

Industrial expansion in the Emirate of Dubai has driven widespread adoption of forklifts and other powered industrial trucks throughout manufacturing, logistics, construction and warehousing operations. While this mechanization has significantly improved efficiency, it has also introduced new challenges.

Operating forklifts on busy production lines and along pedestrian routes increases the risk of collisions, tip-overs and falling loads. Industrial facilities are largely facing such accidents due to high traffic, congested spaces, limited visibility and pedestrians working nearby forklift operations. This technical guideline focusses on providing control measures from traffic management plan, introducing vehicle technology, recommended working practices for safe handling, operator training to prevent pedestrians and operators from forklift related accidents. The guideline shall be implemented by all personnel involved in site operations and traffic activities within the premises.

Dubai Municipality is committed to managing health and safety aiming to keep people safe, reduce risk and prevent injuries in the workplace. Local Order No 61 of 1991 emphasizes the role of employers to take every precaution necessary for the protection of their workers and ensure their safety from any occupational illnesses or potential work accidents.

2 Scope

This technical guideline applies to all warehouses, factories and distribution centers, covering traffic involving forklifts and their interactions with pedestrians, contractors and visitors across operational areas within company premises including, but not limited to loading/unloading bays, production lines, storage, aisles, pedestrian walkways, external yards, workshops, charging stations and cold room areas.



3 Definitions

Definition	Meaning
Forklift (Counterbalanced)	A powered industrial truck fitted with fork arms on which the load (either palletized or not) is carried in a cantilever position relative to the front wheels and balanced by the mass of the truck. Forklifts may be powered by electric batteries, LPG, diesel/petrol engines, hybrid and are used for lifting, transporting and handling loads within warehouses, factories and yards.
Hazard	Source or a situation with a potential for harm in terms of human injury or ill health, damage to property, damage to the environment or combination of these.
Pallet	Rigid horizontal platform designed to be lifted by forklifts and used as the base for assembling, storing, stacking or moving goods. Pallets are made from wood, plastic, metal or composite and come in 2-way or 4-way entry with open or closed decks and rated load capacities.
Mechanical Handling Equipment	Mechanical or electro-mechanical equipment used to transport, lift, pick and deposit unit loads.
SWL	Safe Working Load
Competent person	A person who by means of a combination of training, experience and education has the knowledge to carry out the task safely and effectively.
Operator	Person trained and responsible for the safe use of mechanical handling equipments.
EIAC	Emirates International Accreditation Centre

4 Guidelines

4.1 Risk Management and hazard control for forklift operations

4.1.1 Identify Potential Hazards:

- Technical considerations include identification of specific areas where forklifts and pedestrians are in proximity to assess the work site layout for poor visibility, traffic design, driving surfaces, blind spots.

- Assess driving surfaces for hazardous steep slopes or uneven terrain, areas with floor openings, ramps, and loading docks. Identify areas where maneuverability is restricted due to tight space.
- Forklift Factors: Identify forklift, vehicle conditions including visiting ones, excessive noise, vibration or fumes and safe working load conditions.
- Human factors such as worker/driver fatigue, distractions like mobile usage, driver training, competence, supervision, medical fitness, license.
- Environmental Conditions such as heat, humidity, ventilation, low light areas.

4.1.2 Risk Assessment:

Following identification, each hazard must be assessed to determine the severity and likelihood of harm.

- Identify all individuals who could be affected by the hazard, including direct employees, contractors and visitors.
- Determine the potential severity of harm, from minor/ major injury or fatality.
- Measure the likelihood of an incident occurring, considering how frequently people are exposed to the hazard and under what conditions.
- Consider any potential for long-term health effects, such as exposure to vehicle emissions or chronic noise.

4.1.3 Control the Risk:

Risks with the potential for the most severe consequences, or those most likely to occur, must be prioritized for immediate control. Having completed the risk assessment and having taken account of existing controls, the establishment should be able to determine whether existing controls are adequate if new controls are required. Hierarchy of control measures such as elimination, substitution, isolation, engineering/ administrative controls, Personal Protective Equipment can be followed.

Examples:

- Elimination: Remove the need for pedestrians and forklifts to share the same space. *Example:* Installing overhead walkways
- Substitution: Replace the activity or equipment with something less hazardous. *Example:* Conveyor systems.
- Isolation. Physically separate pedestrians and forklifts where elimination is not possible. Example: high impact barriers, gated crossings, bollards.
- Engineering Controls: Examples: 360-degree camera, sensors, install blue/red visual warning lights etc.

- Administrative Controls: Example: Traffic Management Plan, Standard operating procedures, floor markings, warning signage, training, supervision, restricted access during forklift operation, preventive maintenance etc.
- PPE (Personnel Protective Equipment) – High visibility vests, safety shoes etc.

A combination of control measures may be necessary if a single control is insufficient and controls must be checked to ensure they do not introduce new risks. A review is essential when there is a significant change to the workplace layout, work processes or the types of vehicles in use, following any incident or near miss etc. All hazards, risk ratings, and control measures must be documented and maintained

4.2 Traffic Management Plan:

- Prepare a Traffic Management Plan specific to the site activities covering all internal roads, yards, loading bays, docks, aisles and pedestrian routes within the establishment.
- Conduct a comprehensive, documented risk assessment that specifically analyzes forklift and pedestrian interaction points, focusing on high-risk activities such as forklift reversing, operations in blind spots and load handling.
- Preparation of a site map illustrating all permanent and temporary traffic routes, lane widths, designated pedestrian pathways, loading bays and parking areas, speed limits, crossings and location of barriers.
- Clearly mark and segregate zones using color coded to define shared areas, pedestrian-only walkways, and vehicle-only routes, ensuring the map is updated to reflect any temporary changes in the site layout.
- Define procedures for speed limits, short period work, deliveries and mobile operations that affect normal traffic patterns.
- Identification of all types of site traffic including forklifts, delivery vehicles, workers and visitors.
- Define the roles and responsibilities of all personnel who work in or near forklifts. Workers shall be provided with training on how to apply the traffic management plan as part of their overall work site induction.
- Establish clear rules for when and how drivers are to give way or stop for pedestrians or other vehicles, safe operation of forklifts including parking, reversing, loading and unloading.
- Define specific procedures for controlling traffic and evacuating areas in the event of an incident, fire or other emergency.
- Traffic management plan to be reviewed at least annually and after any incident or change in site layout to ensure continued accuracy and compliance.

4.3 Pedestrian–Vehicle separation & Site Traffic Controls

- Pedestrian and vehicle movements shall be physically segregated. Where full segregation is not practicable, the employer shall establish pedestrian-only corridors and clearly marked vehicle exclusion zones.



- Provide engineered controls based on the level of impact risk, for example, use high-impact barriers or bollards in areas with frequent vehicle movement or high pedestrian exposure.
- Pedestrian entrances shall be located away from vehicle gates. Where a shared path is unavoidable, shortcutting through vehicle openings shall be prevented.
- Provide distinct entry/exit points and one-way routes; include turning bays so vehicles do not reverse into work or pedestrian areas.
- Traffic routes shall be kept clear of fixed hazards such as racking structures, battery/LPG charging stations, low door frames, cablings etc. Where proximity cannot be avoided, impact-rated guarding shall be installed to protect assets and structures.
- Do not route site traffic through public parking or pedestrian areas.
- For temporary or changing routes, apply the same standards using cones/temporary barriers and review frequently as site conditions evolve.
- Crossings shall be marked with high visibility lines and signage and approaches kept clear of stacked goods or parked vehicles to maintain sight lines. All barriers, floor markings, and signage shall be inspected frequently for damage or fading and maintained in good condition. Inspection records shall be maintained.
- Use symbols and wording that drivers already recognize. Refer Technical Guidelines for Safety Signs at Work (DM-HSD-GU99-SSW2) for more information.
- Standardize colors across the site: Red = Prohibition/Danger, Amber/Yellow = Warning, Blue = Mandatory, Green = Exits.
- Post site traffic rules at every entrance: speed limits, pedestrian priority and required PPE.
- Define activity zones (loading/unloading, forklift operating areas, pedestrian corridors) with consistent markings.
- Design out blind corners. Where they can't be eliminated, install convex mirrors.
- Provide adequate lighting at all points such as doorways, junctions, crossings, lay-down areas, loading docks and yard entries.

4.4 Technology Assisted Safety Controls:

Where hazards cannot be removed or fully engineered out, selected technologies can cut residual risk and help operators avoid incidents. Use them to supplement, not replace, physical separation, guarding, and safe systems of work.

4.4.1 360 Degree Cameras

- Install surround camera system (4 wide-angle cameras) to achieve a 360° bird's eye view.
- Cameras should be securely mounted on the front, rear and both sides of the forklift to cover all blind spots. Where the load/mast can block forward view with a raised load, fit an additional mast camera to provide a clear view ahead/above the load. Reversing is permitted only when unavoidable and only if the path is clear, rear visibility is ensured using rear camera/mirrors under the direction of trained banksman in areas pedestrians may be present.
- All components, including cameras and wiring, must be industrial grade with appropriate IP ratings (e.g., IP67 or higher) to withstand vibration, dust, moisture and antiglare typical in forklift operating environments.
- The camera display monitor must be mounted securely inside the operator's cab.
- It must be positioned within the operator's line of sight, typically on a corner post of the overhead guard, to allow for glances without requiring the operator to turn their head away from the direction of travel.
- Configure auto-view switching tied to direction/controls so the most relevant view is surfaced without excessive operator input
- If combined with proximity sensors or AI pedestrian detection, ensure alerts are prioritized. All forklift operators shall receive training and certification on the use of technology-assisted safety systems (such as AI), including interpretation of alerts and limitations of automated features. Training records shall be maintained.
- The monitor and its mount must not obstruct the view through the front, rear, or side windows in any way.
- A full system calibration must be performed immediately after the initial installation by the installer. System calibration and function tests shall be performed frequently by a competent technician to verify camera alignment, sensor accuracy, and display clarity. Inspection and calibration records shall be maintained.

4.4.2 Visual Warning Systems: Blue / Red Safety Lights

- Apply blue forward/rear "spot" lights on forklifts where pedestrian interaction is possible; tune projection distance to the space and speed rather than using a fixed value.

- Set shorter projections in narrow aisles (≈1–2 m) to avoid reflections and set longer projections in wide aisles/open areas (≈3–6 m) so pedestrians can detect and react early. Where both narrow and wide aisles exist, set the projection to the narrow-aisle distance by default (≈1–2 m). In brighter zones or areas with skylights, the visibility of the projection should be verified during commissioning.
- Increase projection distance with higher travel speeds and when approaching blind corners, dock doors, or busy junctions.
- Mount lights securely on the overhead guard; adjust vertical aim so the spot lands at the intended distance.
- During commissioning, measure the beam landing point with a tape, run walk-through trials with spotters, and fine-tune distance to local factors (floor reflectance, ambient lighting, aisle width, congestion).
- Where pedestrian exposure is present, combine the blue spot with red halo lights to define a lateral do not access area around the truck especially at aisle ends, turns.
- Aim the arc so the projected line falls 0.5–1.0 m from the outermost point of the truck (counterweight/guard/attachment) around both sides; increase toward 1.2–1.5 m in high-speed open areas or where pedestrians habitually walk close.
- Where feasible, continue the arc to ~180° around the counterweight; in very tight aisles a ~120–150° arc is acceptable if it preserves usable walkway width.

4.4.3 Proximity Sensors

- Fit proximity warning sensors to forklifts operating in shared pedestrian zones, blind corners, transfer points, dock approaches and high rack. Treat sensors as a complementary control layered onto physical separation, speed limits, and operator training.
- Systems such as laser scanners/ ultrasonic/ radar to detect people/obstacles within a defined area and issue clear visual and/or audible alerts to the operator.
- Establish detection zones matched to site speeds and stopping distances.
- Train operators and pedestrians on system intent, alert meanings and limitations.
- Conduct trials on forklifts considering to include work shifts; record zone maps, detection tests with dummy targets/persons, ambient lighting conditions. Detection zones and sensor response shall be verified monthly through functional testing to ensure accuracy under normal operating conditions. Inspection records shall be retained.

4.5 Safe Forklift Operations:

- Ensure that proper procedures are in place and forklifts are only used by authorized operators. Copy of operator vehicle license shall be available on site at all times.

- Ensure forklifts and their attachments shall be inspected and certified by EIAC-accredited inspection bodies annually with certificates retained on-site.
- Ensure third party certified and refresher trainings for all forklift operators, including direct employees and those engaged through temporary or outsourced services.
- Ensure mandatory, site-specific induction for every new worker and visitor covering entry/exit rules, posted speed limits, the site layout (vehicle/pedestrian routes, parking, delivery areas). All site workers, forklift operators, contractors, and frequent visitors shall receive refresher training on pedestrian–vehicle safety (frequently). Training and attendance records must be maintained.
- Maintain a logbook or system for key issuance to prevent unauthorized use, ensuring only authorized and competent operators have access.
- Ensure forklifts are maintained regularly and carry out pre-operation checks before each shift as per manufacturer's recommendations. Include technology-assisted safety controls: clean camera lenses, verify all sensors, and test beacons/alarms so alerts are working. in-house inspections shall be conducted and logged by the maintenance team/safety officer
- A documented pre-operational inspection shall be completed and logged before each shift. Forklifts with defects must be immediately taken out of service, tagged and reported for repair. Repairs shall be documented and the forklift shall not be returned to service until verified and signed off by a qualified maintenance technician and Safety Officer
- Operators must be seated in the designated position to start or operate the forklift and accessing controls from outside the cabin is prohibited.
- Operators must always wear seat belts during operation.
- Travel speed must be managed to ensure a safe stopping distance at all times considering floor conditions, visibility, pedestrian traffic and must not exceed posted site limits.
- Reduce speed at junctions, blind corners, doorways and when merging into main aisles
- Maintain a safe following distance from other vehicles and pedestrians.
- Keep the forks low while travelling, just high enough to clear the floor surface, and tilt the mast slightly back for stability.
- Operating internal combustion engine forklifts in poorly ventilated areas poses the risk of hazardous fume exposure and should be avoided. Where ventilation is inadequate, electrically powered forklifts are the safer alternative. Indoor Air quality and CO levels in enclosed areas shall be monitored periodically.
- Be constantly aware of blind spots created by the mast and load.
- The operator must always face the direction of travel.
- Ensure truck and working platform combination has adequate stability under all circumstances in which it is intended to be used.

- Guards shall be fitted to prevent contact with hazardous moving parts or controls on the forklift.
- Forklift trucks shall be left with the fork arms tilted forward and lowered to rest on the ground and shall be parked in allocated areas. When parking, besides lowering forks, ensure the parking brake is engaged, controls are in neutral, and the power is shut off.
- Do not park a forklift near a source of ignition (e.g., doorways, pits) or obstructing main traffic routes and emergency exits.
- Chock the wheels if parked on an incline or if there is any risk of unintended movement.
- Forklift keys shall be secured in controlled storage and managed through a Key Control System, issued solely to authorized, certified operators and returned upon completion of work.
- Fuel isolating valves for LPG forklifts must be turned off to prevent build up of harmful gases.
- Refueling of internal combustion engine forklift shall be carried out in a well-ventilated area and shall follow the requirements of Dubai Civil Defense.
- Lifting or transporting personnel using pallets, forks, or any other unauthorized means on a forklift is strictly prohibited.
- Any form of reckless behavior or stunt driving while operating a forklift is strictly forbidden. All forklift-related incidents and near misses shall be reported immediately and investigated
- All forklift operators, as well as any personnel working in areas where forklifts operate, shall always wear appropriate Personal Protective Equipment (PPE).

4.5.1 Loading/ Unloading by Forklifts:

- Before any loading/unloading, the operator shall inspect the area to ensure the surface is level, free of oil, debris, and obstacles, and loading docks are structurally sound.
- Ensure to read and understand load capacity diagram (load chart), it informs the operator how much weight can be lifted safely, depending on the lifting height and the load's center of gravity, thus helping to prevent accidents and damage
- Keep the mast of the forklift in upright position before inserting the forks into a pallet.
- Ensure load height does not exceed the height of the load backrest to prevent items from falling onto the operator.
- Operators shall, under no circumstances exceed the rated capacity of the forklift as clearly indicated on the machine's data plate.
- Do not put any part of the body into the mast structure or between the mast and the truck.
- Level the fork and insert it all the way under the load. Adjust the fork as wide as possible to fit the load and to distribute weight equally.
- Do not exceed the recommended load limit which is displayed in the equipment.

- The loads must be positioned correctly and secured on the forks so that they do not tip forward or sideways. In case of load drop, product spillage, or equipment damage, operators shall stop work immediately, secure the area, and report to the Safety Officer. A written incident report shall be completed.
- Position the load according to the recommended load center. Keep heavy loads close to the front wheels to keep lift truck stable.
- Do not raise or lower the fork unless the forklift is stopped and brakes are applied.
- For a load that is unbalanced in shape, place heavier end closer to the front wheels and tilt the mast back.
- The operator should always face the direction of travel.
- Vehicle movements on site should be managed. Banksman may be used to ensure vehicle movement in the vicinity of pedestrians are carried out safely. Access to loading/unloading areas shall be restricted to authorized personnel only, controlled through barriers, gates, and warning signage.
- Ensure trailers/ trucks are immobilized and secured (e.g., with wheel chocks) during loading/unloading to prevent inadvertent movement.

4.5.2 Battery Charging:

- Designate a well-ventilated area to avoid building up of hydrogen gas during battery charging and away from direct sunlight.
- A safe system of work should be in place and instructions posted on site as well in a language understood by the operator.
- Charging stations should be operated by a trained operator and shall be used only for battery charging and changing.
- If batteries are removed, use a battery hoist. Ensure reinstalled batteries are properly secured.
- Smoking is prohibited in the charging area. Take precautions to prevent open flames, sparks or electric arcs in battery charging area.
- Arrangements for flushing and neutralizing electrolytes in case of spill shall be provided as part of emergency procedures. Emergency Response Plan shall be in place for chemical spills, fires, or gas buildup, including spill kits, neutralizing agents, and designated trained responders. Records of spill drills shall be maintained.
- An eye wash shall be provided and for larger installations with an emergency shower.
- Provide and enforce PPE at the charging bay: chemical-splash goggles/ face shield, acid-resistant gloves (nitrile/neoprene), acid-resistant apron/long sleeves, and safety footwear; keep PPE available at the bay and regularly inspected.
- Battery charging log shall be maintained recording the date, time, operator name, start/end voltage, and any observed irregularities during charging.

6 References

- Dubai Municipality Technical Guideline for Personal Protective Equipments
- Dubai Municipality Technical Guideline on Safety Signs at Work
- EIAC-RQ-IB-002 - Accreditation Requirements for Inspection Bodies working in the field of Lifting Equipment & Lifting Accessories
- Local Order No. (11) of 2003 – Concerning Public Health and Safety in the Emirate of Dubai
- OSHA Standard 29 CFR 1910.178 – Powered Industrial Trucks

5 Suggestions, Comments & Complaints

For (suggestions, comments, and complaints)	For further information
▪ Unified interactive platform that connects Dubai Government and its customers: The 04 Platform https://04.gov.ae/ Dubai Municipality - Call Center (24/7): 800900	▪ Safety@dm.gov.ae Dubai Municipality - Call Center (24/7): 800900