RAS AL KHAIMAH
ECONOMIC ZONE

RAKEZ HS&E REGULATIONS

FIRST EDITION - 2022

FOREWORD

The health, safety, and environment rules and regulations provide broad standards for all stakeholders and business activities operating within the jurisdictions of Ras Al Khaimah Economic Zone to adhere. The purpose is to ensure a high level of health and safety for people and property, equipment, and the environment against risk and hazards associated with the operations as per the employer's licensed activities.

These regulations are effective from the date of issuance of their current edition and have the force of law, and all stakeholders are obligated to comply with them strictly. This document shall be read in conjunction with other RAKEZ regulatory documents and other applicable local and federal HS&E requirements, laws, standards, regulations, and guidelines.

The employer is also responsible under UAE Federal and Local laws, for the protection and safety of their employees from all risks/hazards that exist at work and injuries, disease, and fire, etc. may result. The employer shall take the appropriate precautions and control measures to the satisfaction of RAKEZ.

All stakeholders are required to adopt and operate clean, modern technologies, efficient use of energy and materials, and minimise waste generation by implementing recycle, reuse, and recovery (RRR) options, and the safe and responsible disposal of any residual wastes. An effective balance has to be achieved between the industry and environment to provide the necessary protection measure to the environment and ensure industrial growth and sustainable development.

The HS&E rules and regulations are available through RAKEZ's official website: https://www.rakez.com.

The regulations are also periodically reviewed, updated, and made available to the stakeholders as part of the RAKEZ HS&E Department's responsibility. The stakeholder shall familiarise themselves with this document to ensure RAKEZ HS&E Rules and Regulations are complied with.

Contents

1. Scope

a. These regulations apply to all the companies and organisations operating within the jurisdictional areas of Ras Al Khaimah Economic Zone (RAKEZ).

b. These regulations provide minimum mandatory health, safety and environment requirements/prescriptive criteria to be complied with by all stakeholders of facilities, projects, and all forms of businesses and activities operating within RAKEZ jurisdictional areas. Also, all requirements placed in these regulations shall be fully complied with, wherever applicable, and the ones contained in appendices to these regulations are mandatory concerning the principal matter to which they stand as requirements. These regulations are based almost on functional requirements and contain detailed dimensional and technical specifications as specified in relevant local/federal laws.

c. These regulations contain the list of offences in which appropriate financial penalties shall be imposed. Neither non-possession nor ignorance of these regulations will be considered a reason for the non-imposition of a penalty for violation of these regulations.

d. Enforcement of these regulations shall be the responsibility of the RAKEZ HS&E Department. The RAKEZ HS&E Department is authorised to visit all facilities/operations to ensure that the standards, regulations, and guidelines are being complied with. In case of unsatisfactory circumstances that may be found during these visits, the RAKEZ HS&E Department will take necessary actions to ensure a safe, healthy and clean environment.

e. The stakeholder shall comply with certain requirements and recommendations [that may not be covered in these regulations/adopted references] that are necessarily recommended by the RAKEZ HS&E Department on a case-by-case basis.

f. Nothing in these regulations shall be interpreted as overriding or contradicting the laws of the UAE, local/federal authorities' regulations, and the provisions of international, national, or regional regulations as amended and as applicable.

g. Nothing contained in these regulations shall be interpreted as relieving the employer and/or employees of any organisation from their responsibility for the safety of the operations/activity of the licence(s) issued by RAKEZ.

h. The stakeholders are required to have their lands and premises insured against fire, explosion, and peril.

i. RAKEZ reserves the right to revise at any time, change, amend or remove any or all of the provisions contained in these regulations with or without prior notice.

j. Where the situation and the context warrants, the stakeholders, shall be obligated to gather the explicit interpretation of the words of any provisions of these regulations from the RAKEZ HS&E Department.

k. Shall any of the provision(s) herein contain conflicts with superseding or with regulations and codes which are broader in scope, the text of the applicable codes, standards, and publication shall be enforced

l. The provisions of these regulations shall be read in conjunction with other RAKEZ regulations and standards.

2. Roles and Responsibilities

2.1. Employer Responsibilities

a. The employer is accountable and shall implement activities and operations adhering to RAKEZ's HS&E Rules and Regulations. The employer shall also adopt all regulations, guidelines, work instructions, etc. issued by RAKEZ from time to time.

b. The employer shall comply with all applicable NOC/permits/certificates from relevant government authorities. (Please refer to Appendix F).

c. The employer shall provide adequate preventive and protective measures/equipment/conditions to protect employees against the risk of injury or occupational disease that may occur during work activities, and also against fire hazards and other hazards that may result from the use of machinery and other equipment, handling of chemicals/toxic substances or performing any other task at the workplace, as well as indoor air quality monitoring, noise monitoring, employee medical evaluations, etc. Before engaging them in work activities, employees shall be informed of their roles, responsibilities, risk of the activities they will perform, and how to overcome these occupational risks. In the same regard, all facilities, machinery/equipment installation, material storage, and/or operations shall need to be approved by the relevant Authorities before operating therein.

d. Without prejudice to the provisions of the regulations and orders issued by the relevant authorities, the employer shall ensure adequate safety, cleanliness, and ventilation in each workplace and shall provide each workplace with adequate lighting, drinking water, employee amenities, and sanitation/toilets.

e. Notification of communicable diseases: An employer shall arrange for, medical institutions approved by the Ministry of Health & Prevention (MOHAP) to carry out pre-employment and subsequently, periodic detailed medical examinations as per Ministerial order 37/2 of 1982 at intervals defined by MOHAP on those of his employees who are exposed to the danger of contracting any of the infectious/occupational diseases. Any abnormal results of the periodic medical examinations shall be reported to the Preventive Medicine Department at the MOHAP or the equivalent in other health authorities as per the requirement of Federal Law No. (14) of 2014 Concerning the Prevention of Communicable Diseases. This case shall be brought to the notice of the HS&E Department immediately. A periodic examination shall be required by a registered medical service supplier for any employee who is exposed to occupational disease to be re-examined at suitable intervals, depending on the employee's condition. The employer shall take suitable preventive and/or corrective actions concerning the employees' well-being as per the stated or prescribed by a registered medical service supplier.

f. The employer or his representative shall inform each employee at the time of his recruitment of the dangers associated with his occupation and the protective measures he shall take based on risk assessment of the occupational hazards conducted by HS&E officer or specialist and shall post detailed written instructions in this regard at the workplaces. The employer shall also ensure that all possible/required training/licensing requirements are met before permitting employees to work on any equipment/area. All employers have the following responsibilities under the duty of care:

- To protect the safety, health and welfare of employees, members of the public and others from their work activities.
- To ensure that others are not exposed to unnecessary risk by their acts or omissions.
- To stop unsafe working practices or report unsafe working practices to their manager.

g. The employer shall display detailed instructions and safety signages in a prominent location at the workplace indicating the measures to be taken to prevent any potential risk and protect the employees against hazards to which they may be exposed while performing their work. All safety signages used within RAKEZ jurisdiction must comply with ANSI Z535 and or ISO 7010 with mandatory use of "Graphic Symbol" and all messages/text in English/Arabic and another language understood by the employee.

h. The employer shall provide his employees with medical care facilities corresponding to the standards laid down by the UAE and the Emirate of Ras Al Khaimah.

i. The employer shall provide first-aid box(s) containing bandages, antiseptics, and such other first-aid material as may be required depending on the nature of work. The box shall be located in a conspicuous place and within easy reach of the employees. The use of the box shall be entrusted to a person specialised in giving first aid in accordance with Federal Labor Law no. 8 of 1980 and Ministerial Decision no. (37/2) of 1982, Ministerial Order no. 32 of 1982. (Refer to Appendix B: First Aid Arrangements)

j. Every employee shall comply with the instructions and orders respecting industrial and personal safety precautions, use the necessary protective devices, and treat any such devices in his possession with due care. It shall be unlawful for an employee to commit any act leading to non-compliance with such instructions, misuse the equipment provided for protecting the health and safety of the employees, or damage to such equipment. The employer can impose penalties on employees for noncompliance to RAKEZ HS&E Rules and Regulations. However, it remains the responsibility of the employer to ensure that all employees are fully aware of HS&E requirements at their workplace through suitable documented training, awareness drives, etc. The employer shall record and maintain records for the training of employees.

k. The employer shall be responsible for the health and safety of all visitors/contractors/3rd party employees that operate within his/her premises.

l. RAKEZ and relevant authorities are authorised to prescribe the general and/or specific HS&E precautions and health protection measures applicable to all employers under RAKEZ jurisdictional areas from time to time and it remains the responsibility of the employer to remain aware of relevant HS&E requirements to ensure that all such precautions are taken.

m. The employer shall, at any time allow RAKEZ officials and other relevant government authorities to:

- Enter its place of business;
- Examine records;
- Make copies of the records;
- Inspect, document, record the status of the facilities as required;
- Take samples of materials or substances as required.

n. An operation fitness certificate (OFC) applies to all licences operating from any facility within RAKEZ jurisdictional areas and shall be obtained to ensure HS&E compliance. It shall be obtained upon receipt of a building completion certificate from the Technical Support Services Department of RAKEZ. The OFC also applies to any facility at a plot of land or upon receipt modification completion certificate for modified leased built-up facilities. Applications shall be made by the employer as per the guidance to obtain OFC in the first instance to the HS&E Department and it covers (but not limits) all employers operating in RAKEZ, that have a lease and/or a licence issued by RAKEZ and carry out either service/trading/manufacturing activities. The requirement of this certificate is mandatory for all employers operating in a plot of land, warehouses, or retail shops before commencing any commercial/industrial operations. OFC shall be issued with a validity of a maximum of 12 months which will eventually be in line with the employer's license expiry date, thereafter it shall be renewed annually before expiry. For further information on employer OFC request, refer the Guidance to obtain Operation Fitness Certificate (OFC) (HSE-GU01).

o. Wherever an existing employer modifies/adds to its facilities/activities, the existing OFC shall be requested 10 days prior to starting operations. This is also applicable to sub-leases.

p. Any facility within the employer's premises damaged either partially or fully due to fire incident and/or structural collapse, shall not be commercially operated until the following steps are fulfilled:

- The employer must obtain the "To Whom It May Concern" Certificate supplied by RAK Police to RAKEZ;
- The employer shall obtain TSS Department approval for the structural and MEP integrity;
- If the power is disconnected by any local or federal entity the employer shall approach Etihad WE for their inspection and power re-energizing;
- The employer shall submit an operation fitness certificate (OFC) request to HS&E to confirm compliance.

q. The employer shall be solely subject to the laws of the UAE for losses or damages in terms of life and property stemming from design errors, implementation errors, deficiencies of inspections, failure to comply with the required standards and rules of professional ethics, failure to use knowledge and experience to the contractor, and similar reasons; and successively (severally) liable with the contractors where the consultants have undertaken design control and inspection services on works. The consultants shall be caused to complete and compensate for any such losses or damages according to the laws of the UAE.

r. RAKEZ and its directors, officers, and other concerned personnel shall not be held responsible or liable for any such losses or damages, errors, deficiencies, and failures on the part of the employer.

s. Sanctions & Penalties: There are three broad types of unsatisfactory circumstances that have been identified:

- Minor: There could be other circumstances that detract from the appearance and proper functioning of the works with potential for HS&E impacts that are reported or observed by the HS&E Department. In these circumstances, notification shall be provided either orally or by letter to the employer. Where

the works/licensees are persistent offenders or ignore the notification, a warning notice will be sent, setting out a schedule of correction.

- **Major:** Where there is a major fault with potential danger to the health or safety of employees/public, but where it is considered that time can be given for correction; a correction notice will be issued setting out a schedule for correction.
- **Critical:** Where there is a serious non-conformity and/or imminent danger to the health or safety of the employees or other persons of the general public, a prohibition notice will be issued requiring immediate closure of the offending unit until the fault is corrected.

t. The employer is responsible for ensuring compliance to the above clauses and failure to comply with the clauses may result in sanctions (administrative/legal/operational) as determined by the HS&E Department and/or penalties as stated in the RAKEZ violation code, which can be reviewed at www.rakez.ae.

u. Employee Responsibilities: An employee is responsible for the following, but not limited to:

- Not endanger themselves or others;
- Follow precautionary control measures to ensure work activities are performed safely and without risk to health;
- Cooperate with the employer and receive safety information, instruction, supervision, and training;
- Report any activity or defect which they know is likely to endanger the safety of themselves or that of any other person;
- Report to the employer any cases of occupational disease;
- Use the correct tools and equipment for the work activities, use them safely without danger to health;
- Use work equipment as intended by the manufacturer;
- Where required or instructed by the employer, use personal protective equipment, and ensure it is maintained in good condition;
- Follow correct manual material handling practices;
- Follow instructions and signs posted for the protection of employees from occupational hazards;
- Must not be intoxicated with alcoholic drinks or drugs in the workplace.

2.2. RAKEZ HS&E Department

The HS&E Department is responsible for the following, but not limited to:

a. Enforcement and implementation of these rules & regulations to protect the health and safety of employees at all sites/locations as well as the environment under RAKEZ jurisdictional areas;

b. The Inspection of facilities shall be, either:

- During business hours, OFC, and/or NOC shall be scheduled in coordination with the employer; or
- All other inspections such as compliance monitoring shall be made unannounced at anytime as per the discretion of RAKEZ.

c. Any employer who refuses RAKEZ HS&E Department enter into the premises to conduct an inspection or perform their role shall be subjected to appropriate sanctions (administrative/legal/operational) as determined by the HS&E Department and/or penalties provided in the existing RAKEZ violation code;

d. Issue/amend necessary regulations and guidelines for the safe conduct of work activities;

e. Inspect workplaces, take samples, photos, scans and issue directions to ensure compliance with HS&E requirements;

f. Issue warning/improvement/prohibition notices and/or penalties, where required;

g. Prepare and execute and/or recommend HS&E - related education/training/awareness programs;

h. Liaise with relevant government authorities to facilitate compliance with local regulations.

2.3. HS&E Representative

All industrial/commercial employers shall appoint at least one HS&E Representative for each workplace. The HS&E Representative shall be competent to address the health and safety requirements on behalf of the employer and comply with RAKEZ HS&E Rules and Regulations. The HS&E Representative shall have practical experience of working in a similar supervisory capacity for not less than three years, or experience not less than three years that has sufficient knowledge, training, and experience to ensure work activities are performed safely and without danger to health. Details of the appointed HSE Representative must be submitted to RAKEZ HS&E Department upon appointment or change of personnel.

2.4. Contractors

All employers shall be responsible to ensure that contractors and their employees operate within their premises only after obtaining required permits/NOCs from TSS Department. The health and safety of all visitors, persons of determination shall remain the responsibility of the employer. All contractors to the premises of an employer under RAKEZ jurisdictional areas shall abide by the rules and regulations as set out by RAKEZ as well as the conditions that may be issued by the employer.

2.5. Consultants

Consultants are the professionals who will provide unbiased expert advice to the employers and can also act as interim executives that can help in the decision-making of their employers. All consultants shall be solely subject to the laws of the UAE for losses or damages in terms of life and property stemming from design/reporting errors, supervision and/or implementation errors, deficiencies of inspections, failure to construct in compliance with the required standards, failure to comply with rules of professional ethics, failure to use knowledge and experience to the contractor, and similar reasons; and successively (severally) liable with the contractors where the consultants have undertaken control and inspection services on works. The consultants shall be liable to complete and compensate for any such losses or damages according to the laws of the UAE. RAKEZ and its departments, directors, officers, and other concerned personnel shall not be held responsible or liable for any such losses or damages, errors, deficiencies, and failures on the part of the consultants.

3. Communal Areas

This section addresses broadly the major health aspects of the population as a whole within or outside RAKEZ jurisdictional areas. The aim is to prolong and improve quality of life through organised efforts, and informed choices of society, organisations, public, private, communities, and individuals.

3.1. Cleanliness

It is the responsibility of the employer to maintain good indoor and outdoor housekeeping, including fences that shall be free from flying waste such as polybags, papers, etc. Littering is an offence and shall be penalised.

3.2. Advertisement & Goods Display

It is prohibited to fix any billboard, notice, placards, or any other paper or means of the advertisement upon any building, against any wall or places other than the places designated by RAKEZ. In the same context, it is prohibited for any employer to display, store or abandon goods, park containers or vehicles, or carry out any sort of activity outside of their premises and they have to ensure that the footway fronting them is clear, clean, and safe.

3.3. Public Nuisance

No activities shall be carried out by any employer that shall cause a potential hazard or nuisance to any neighbors and/or public, such as air pollution/emissions, noisy operations, improper storage, poor housekeeping, waste discharges, odorous releases, etc. All facility operators shall ensure that their operations are carried out safely and in an environmentally sustainable manner with due consideration to their neighbors and public health.

3.4. Waste Management

All wastes shall be managed in accordance with Federal Law No. 24 of 1999, Federal Law No. 12 of 2018, and subsequent executive orders/decrees.

3.4.1 Collection of Waste

a. All putrescent/rotten refuse shall be collected in plastic dust bins with inner bags and covering lids before being disposed of in the skip;

b. Light waste such as papers, polybags, or light packing materials that may move or fly easily by the wind shall not be disposed of untidily into skips or in any uncovered bins;

c. Permanent garbage skip placing area and garbage skip shall be provided (within the plot limit only) for the disposal of domestic refuse and it shall be cleaned regularly. Adequate access to garbage skips shall be ensured to enable the safe collection of wastes.

d. All non-hazardous waste shall be disposed of in the skips/bins provided by the RAK Waste Management Agency. It remains the responsibility of the employer to establish suitable contracts with the service provider and ensure that advance notice is given to enable the regular clearing of waste from skips.

e. Collection/interim storage and disposal requirements of hazardous/industrial wastes shall be in accordance with Federal Law No. 24 of 1999, and subsequent executive orders/decrees, and suitable segregated areas shall be provided for this purpose within the employer's premises.

f. Waste generators who require sell/recycle wastes/scrap materials shall dispose of/recycle as per the requirements of the waste management agency of PSD.

3.4.2 Prohibited Disposals

It is prohibited to throw down, place, abandon or discharge any waste and/or unwanted materials in any public/communal/private areas, e.g. roads, sewers, open lands, quay areas, roofs, other's skips/garbage bins, fence, etc. Such prohibitions include, but are not limited to:

a. Disposing of all kinds of unwanted materials such as domestic garbage, industrial waste, chemical/oil, and wastewater including overflowing manholes, septic tank/soak away, and A/C condensed water;

b. Throwing or disposing of solid waste, e.g. cloths, plastics, papers, cigarette tips, etc. and/or chemical/oil in the sewerage line, manholes, or drainage pipeline and its appurtenances;

c. Disposing of chemicals or other hazardous materials like a toxic waste; corrosive chemical waste or their empty cans into ordinary skips. Separate Special Waste Containers shall be used for the interim collection of such wastes before disposal/recycling. Prior approval shall be taken from the PSD before disposing of such waste. It remains the responsibility of the employer that generates the waste to ensure that approvals/permits are obtained from the PSD for the disposal of that waste;

d. Disposing of anything which may hinder the free passage of vehicles/pedestrians, adversely affect the environment within RAKEZ areas, causes contamination, or any other breach/threat to public health and safety;

e. Unauthorised disposal (without the approval/permit of the PSD).

3.5. Pet Animals

No pet animals, birds, or livestock are allowed to be kept or fed in the area/premises without prior permission from the relevant authorities.

3.6. Pest Controls

All pest control activities shall be carried out in accordance with the requirements of the Public Service Department. All pest control companies must have a suitable trade licence issued by RAK Authorities to conduct pest control activities within RAKEZ jurisdiction.

a. **Prevention of Rodents:** At points where pipe works/vents/services, etc. pass into buildings, maximum care shall be taken to ensure that rodents cannot gain access. It remains the responsibility of the employer to maintain regular contracts with the landscaping agency of PSD to prevent infestations;

b. **Termite Control:** Pre-construction termite treatment is strongly recommended for all buildings;

c. **Pest Infestations:** It is the responsibility of all employers to report to the landscaping agency of PSD in case of any pest infestation. The employer shall be responsible to take necessary preventive/corrective actions in this regard;

d. **Aerosol Agents:** The employer may not use any form of residual pesticide but may use aerosol/flushing agents, which are properly labelled. With the exceptions of domestic aerosol products, employers are not permitted to use any pesticides in the zone without a permit from RAK Municipality;

e. **Fumigation:** All private employers who conduct fumigations/pest control services shall have a relevant licence/permit/approval from RAK Municipality;

f. **Infections:** The employer shall report immediately inform RAKEZ and other concerned authorities in case of an outbreak of any infectious disease and food poisoning cases (Refer to Sub-section 2.1.e).

4. Occupational Health & Safety

All employers are expected to understand all the requirements of Federal Law No. 8, Ministerial Order No. 32 of 1980, and UAE Fire and Life Safety Code of Practice (latest version).

All employers must at a minimum ensure they have suitable arrangements in place, including:

a. Risk Management;

b. Operational Controls;

c. Incident Reporting and Investigation;

d. Training and Competency;

e. Emergency Preparedness and Response.

4.1. Risk management

The employer must implement a risk management plan, this is the process of putting a strategic plan for managing identified risks into action. Such a process may take many forms depending on the business culture of the entity, history of previous efforts, available resources, number of employees, and other factors.

4.2. Risk Assessment

Risk identification and assessment is a risk assessment. Risk assessments are undertaken for specific work activity, equipment, location, operation, etc., or a combination of all of these. A risk assessment is a method used to rank the risk of safety and health issues. The employer will ensure perform risk assessments on foreseeable safety and health issues and other identified hazards.

The risk assessment should contain the following information:

a. Identify the hazards;

b. Identify who/what may be harmed;

c. Evaluate the risk;

d. Determine the severity;

e. Determine the likelihood;

f. Define the level of risk.

4.3. Risk Reduction

Once the level of risk has been identified the unacceptable risks must be reduced to an acceptable level, this involves using the hierarchy of control to identify the most effective control measures. The hierarchy of control includes:

a. Elimination of the hazard;

b. Substitution of the hazard;

c. Engineering controls;

d. Segregation;

e. Administrative controls;

f. Personal Protective Equipment.

4.4. Residual Risk

Once the risks have been revised through the hierarchy of control the residual risk should now be determined.

4.5. Record and Communicate the Risk Assessment Findings

The significant findings of the risk assessment should then be communicated to the following:

a. Employees implementing the recommended control measures;

b. Employees who can assist with the implementation of the control measures;

c. Risk assessments must be recorded and maintained for all work activities.

4.6. Review of Risk Assessments

Periodic reviews of risk assessments must be conducted to ensure control measures are working as intended to reduce risks and ensure no new hazards have been introduced. Risk assessments must be reviewed when something changes in the workplace, including but not limited to:

a. Following an incident;

b. Changes to work patterns or personnel;

c. Changes to machinery or equipment;

d. Changes in the processes;

e. Changes in the location;

f. Changes of materials or substances;

g. An investigation by relevant authorities;

h. Updates to legislation and requirements.

4.7. Operational Controls

Employers shall establish and stipulate operating criteria where they are necessary for the prevention of injury or ill-health to employees and others. Operating criteria should be specific to the employer and its activities and operational requirements. Operational control shall relate to the identified hazards and risks, where any absence could lead to failure to comply with relevant Federal Laws.

Employers conducting industrial activities shall have an HS&E Plan for the management of HS&E within their workplace.

The information contained in the HS&E Plan should address the following, including but not limited to:

Description of the industrial facility/project, including key dates and timescales, and details of personnel involved;

- Risk assessments;
- Legal requirements and other requirements;
- HS&E objectives and targets;
- Roles and responsibilities of key project personnel;
- Training requirements to ensure the competency of personnel;
- Client considerations and management requirements to implement communication, participation and consultation processes;
- Occupational safety, health and welfare requirements;
- Waste management;
- Emergency preparedness and response;
- HS&E performance measurement and monitoring;
- Incident reporting and investigation;
- Non-conformance, corrective and preventative action;
- Audit.

The operational control section of the HS&E Plan should contain at a minimum the following information:

- Risk assessment;
- Method statements;
- Permit to work;
- Site rules;
- Temporary works;

- Personal protective equipment;
- Working at height, hot work, confined spaces, excavation, electrical safety;
- Safe selection and use of lifting equipment;
- Traffic management;
- Tools and equipment;
- Compressed air;
- Hazardous substances.

4.8. Incident Reporting and Investigation

The employer must have a system for the notification of incidents reportable to RAKEZ and other concerned authorities.

Table 4-A: Reportable Incidents and Notification Requirements

Type of Reportable Incidents	Notification Period to RAKEZ and other concerned Authorities
Fatality	Immediately
Injuries	Within 48 Hours (For incidents not covered in section 4.9.3)
Occupational Diseases	
Dangerous Occurrence	

4.9. Incidents at Workplace

4.9.1 General Requirements

Incident prevention measures are achieved by conducting regular risk assessments, safety audits, medical screening, etc. The employer shall not wait for a serious injury to occur before appropriate steps are taken to control a hazard. Action taken after a “Near Miss” can prevent future injuries and losses resulting from damage. However, any HS&E incident at the workplace needs to be addressed adequately by the employer.

4.9.2 Responsibility

The employer shall be responsible for ensuring the health and safety of his employees and any contract employees employed at their respective premises during their operations. The employer shall also be accountable for any incident that may occur within his respective premises. However, it remains the responsibility of the main contractor to follow the provisions of this document.

4.9.3 Duty to Notify

The employer will ensure that all dangerous occurrence and the following types of incidents are reported to the nearest RAKEZ Security checkpoint immediately by telephone as per emergency contact number (Refer to Incident Notification Form (HSE-RR01.F01) which is available 24 hours a day, 7 days a week. The types of incidents that require **immediate** notification are as follows:

a. Fatality;

b. Fire incident;

c. Structural collapse of buildings, cranes or equipment;

d. Any fracture;

e. Any amputation;

f. Dislocation of the shoulder, hip, knee, or spine;

g. Loss of sight (temporary or permanent);

h. A chemical or hot metal burn to the body;

i. Penetrating eye injury;

j. Any other injury that results in unconsciousness or requires resuscitation/hospital admittance;

k. Any injury resulting in the casualty being admitted to hospital for more than 24 hours;

l. Any minor injury resulting in an absence from work unable to undertake normal active duties for less than 3 days;

m. Any injury where an employee is absent from work for more than 3 days, not including the day of the incident;

n. Any major injury suffered as a result of an incident arising out of or in connection with any work carried out on the premises;

o. Any injury suffered by a person, not at work, e.g. a visitor, customer, passenger, by-stander as a result of an incident arising out of or in connection with work where that person is taken from the incident site to hospital for treatment;

p. Any chemical/Gas/waste leak/discharge with a potential for HS&E impacts;

q. Incidents include non-consensual physical acts of violence done to a person at work, suicide in/out of work;

r. Occupational/reportable/infectious diseases;

The above injury conditions shall be reported immediately to the RAKEZ security section at each zone and to hse@rakez.com within 24 hours of the incident, using Incident Notification Form (HSE-RR01.F01). Employers and employees are obliged under duty and law to disclose incident data to security and safety representatives and authorities.

4.9.4 Investigation of Incidents

All incidents shall be investigated to determine their cause and define the actions that shall be taken to prevent any similar incidents in the future. The formality and depth of the investigation shall be proportional to the severity or potential severity of the incident. The names of witnesses shall be recorded and any relevant photographs taken shall be identified, captioned, and dated. The investigation shall consider all the relevant

evidence. This may include the site where the incident occurs, plant, the type of materials being handled or substances being used, systems of work, responsibilities, and people involved, including their physical or mental condition, training, and competencies. It is important to investigate not only the direct cause of an incident but also to determine the underlying cause or causes, which are often the real cause of an incident. Following an incident, a copy of the detailed incident investigation report and supporting documents are required to be submitted to hse@rakez.com within 7 days of the incident.

4.9.5 Incident Records

The employer shall establish and maintain an incident record system at the workplace and shall make this record available to RAKEZ. This system shall contain the following information:

a. Nature of incident;

b. Description and cause;

c. Name/details of the employee affected;

d. Treatment given;

e. Days of absence;

f. Corrective action is taken.

The employer shall keep incident records for a minimum of three years.

4.9.6 Sanctions and Penalties

Contravention of any of the provisions above is an offence. Inability by the employer to ensure incident-free operations shall also invite sanctions/penalties from RAKEZ, especially where it is established that adequate safeguards were not taken to prevent the re-occurrence of incidents.

4.10. Personal Protective Equipment (PPE)

The employer shall ensure all possible engineering controls are put in place to eliminate or significantly reduce the risk of injury arising from work activities and site hazards. In the hierarchy of control measures; PPE is always to be used as a last resort and never relied on as the primary method of controlling the risk of injury. The employer shall ensure the following:

a. When purchasing and using PPE the employer shall comply with the requirements of the UAE or any International Standard e.g. British Standard (BS), European Standard (EN), or the American National Standards Institute (ANSI) are complied with;

b. All costs associated with supplying PPE to the employees are the sole responsibility of the employer. Under no circumstances can the issued PPE be charged financially to any employee;

c. That all employees are trained in the fitting, use, and maintenance of PPE. As part of the training, the employer will explain the nature of the risks that the PPE is designed to protect against. Regular reminders

in the form of toolbox talks will be given to the employees to prevent them from becoming complacent in the wearing of PPE.

4.11. Competency & Training

The employer or their representatives shall ensure that employee(s) are trained, licensed (where applicable) and competent in the nature of work, and brief their employees before starting work of the risks and dangers involved in the profession they are engaging in, such as but not limited to fire, risk out of machinery, the risk from a hazardous vapor or dust of toxic substances, the danger of falling and relevant occupational diseases, etc. Suitable training shall be given to all employees involved in any potentially dangerous/hazardous operation/activity and such training shall be regularly maintained.

4.12. Emergency Management

4.12.1 Emergency Plans

The employer will prepare an emergency plan to cover foreseeable emergencies, including procedures for managing the following:

a. Fire emergencies;

b. Medical and health emergencies;

c. Incidents;

d. Serious incidents – to be defined in the emergency plan;

e. Facility/project/area evacuation;

f. Night working emergency response.

The emergency plan prepared by the employer will identify the roles and responsibilities of key personnel involved in the emergency procedure. The employer will ensure that all those given responsibilities in an emergency plan are fully briefed on their roles and given the training where necessary to discharge their duties fully.

4.12.2 Assembly Points

The employer will ensure that there is an adequate number of assembly points identified and provided on the premises.

4.12.3 Training

The employer shall ensure all those operating/working on the facility/site are trained in and understand the emergency procedures. The emergency procedures shall initially be communicated to all personnel during the work/site induction but regular reminders shall be given in the form of weekly toolbox talks.

4.13. First Aid Medical Facility

a. All premises shall be provided with adequate first aid facilities for enabling first aid services to be rendered to the employees if they are injured or become ill at work.

b. The employer shall provide or ensure that there is an adequate and appropriate number of suitable persons for rendering first aid. A first aider is a person who has received training and holds a valid first aid certificate from an organisation or employer whose training and qualification for first aiders are approved by RAKEZ. Refer to **Appendix B**: First Aid Arrangements.

4.14. Process Audit

Employers that operate and handle large quantities of hazardous substances or equipment including those employers with critical health, safety, and environmental issues may be required to undergo a process audit, as recommended by RAKEZ.

A process audit can be instructed by RAKEZ to examine whether their operations and systems are in line with the existing regulations and standards and to be able to draw up a plan for corrective action whenever necessary.

Where required the employer will engage a competent process auditor to assess their compliance with RAKEZ rules and regulations (the cost of the appointed process auditor payable by the employer).

Upon completion of the process audit the employer must share the findings with RAKEZ.

Employers must engage only RAKEZ approved auditors to conduct auditing in RAKEZ jurisdiction.

5. Infrastructure & Development Requirements

This section addresses major environmental, health, and safety aspects that need to be adhered to and followed by developers/consultants/contractors/employers during the design and development of proposed and/or existing infrastructure falling under RAKEZ jurisdictional areas.

5.1. Preliminary Requirement

5.1.1 Concept Proposal Stage

The employers shall obtain the necessary licence/lease approval for the office/plot/warehouse/retail outlet allocation from RAKEZ and during the application process, the Development RAKEZ Division Department shall assess the requirements and advise to carry out relevant drawings or studies.

5.1.2 Planning and Commencement of Construction Works

All Developers/consultants/employers shall obtain a building permit from the TSS Department. The employer's facilities shall comply with the required all applicable health, safety, and environmental standards as defined by relevant authorities in the design stage of the project. any developer/employer who intends to construct/erect/modify/alter/add/expand a residential, industrial, commercial,

educational building/facility and carry out any civil/mechanical/electrical/plumbing/infrastructure works such as building factory, warehouse, shop fit-outs, internal roads, earthworks, plot levelling, fencing, pipelines, tanks, machinery layout, racking systems installation, etc. shall follow the required procedure and guidelines before applying for the Building Permit to be obtained from the TSS Department. Developers/consultants/contractors/employers shall ensure that design and development comply with the following rules and regulations requirement (but not limited to):

a. UAE Fire and Life Safety Code of Practice;
b. RAKEZ building regulations and design guidelines;
c. RAK Municipality building regulations and construction specifications;
d. RAK Municipality green building regulations - (Barjeel);
e. RAK Municipality's food guidelines;
f. Local/federal regulations and guidelines wherever applicable;
g. Environmental rules, requirements & guidelines of Environment Protection and Development Authority (EPDA);
h. Other applicable international rules and regulations.

5.1.3 Facility Completion Certificate

Upon completion of the construction of project/building/facility/modification/alteration/machine layout/fit-outs/racking works, the consultant (contractor for small modifications/fit-out works) shall apply to TSS Department for obtaining building completion certificate (BCC) for plot facility and modification completion letter for the pre-built facility.

5.1.4 Operation Commencement

After obtaining, a building completion certificate (BCC), the employer shall apply to the HS&E Department for obtaining an operation fitness certificate (OFC). The facility shall not be operated unless an operation fitness certificate (OFC) is obtained from the HS&E Department.

5.1.5 RAKEZ Power of Authority

At the discretion of RAKEZ, the Building Completion Certificate may be cancelled/suspended if:

a. Work was carried out in contravention of the conditions of the BCC or any regulations issued by RAKEZ;
b. It is subsequently revealed that the BCC was issued based on erroneous or inadequate information supplied by the developer or his agent;
c. BCC will not be withheld unreasonably, but RAKEZ shall have the discretionary power, to attach such special conditions thereto.

RAKEZ is empowered to change, amend, add, replace, and/or update the regulations without notice. It is the developer's/licensee's responsibility to obtain updated regulations and rules.

RAKEZ reserves the right to levy fines for breach of regulations and to suspend a consultant or a contractor for non-compliance with the regulations.

5.1.6 Responsibilities and Disputes

a. Neither the checking of the drawings/details nor inspection of the work during the progress of construction, installation shall be construed in any way to impose responsibility and/or liability on RAKEZ or their representatives. The employer, developer, and consultant/agents shall remain entirely responsible for all errors in the design and execution of the project and the stability and safety of construction during the progress of the works and after completion;

b. All complaints and disputes concerning the BCC and the approvals in this regard shall be referred to the RAKEZ senior management. In case of any difficulty or issue concerning RAK Civil Defence and EPDA, the matter shall be, in the first instance, directly reported to Chief Officer or his deputy. It shall be noted that RAKEZ will not arbitrate for financial/contractual disputes between employers/developers and their consultants or contractors. All such disputes shall be settled through the RAK Civil Courts.

5.1.7 Application of Green Building Regulations

In line with policies and directives of RAK Municipality, the implementation of sustainable development practices compliance with fundamental principles addressing environmental sustainability and economic integration, maintenance of biological diversity, and conservation of natural resources ensuring sustainable energy management, construction of the facility with green building – (Barjeel) development practices are mandatory. Therefore, green building regulations (Barjeel) shall be applicable for all new constructions.

5.2. Food Outlets Plan Review (General Guidelines for Design Installation and Construction)

a. All food outlets under RAKEZ jurisdictional areas shall have a valid NOC from the Food Control Department - RAK Municipality before starting any work/operation;

b. All food outlets shall comply with appropriate recognised standards for both design and construction;

c. Location - Food outlets shall be sited in an area away from:

- Environmental pollution and industrial activities which pose a serious threat of contaminated food;
- Pest infested areas;
- Where wastes, either solid or liquid, cannot be removed effectively.

d. Open preparation areas where there is no ceiling or top covering during food preparation shall be subjected to RAK Municipality review and approval depending on the type of food being prepared.

5.3. General Requirements for Health Facilities & Health-Related Employers

Health facilities are defined as companies that practice medical services (such as hospitals, clinics, dental facilities, etc.), and provide supplies/medicines (i.e. pharmacy, optical shops). Health-related employers are referred to as facilities that promote health, hygiene, and wellness assistance/services (i.e. massage and relaxation, spa, beauty center, salon, etc.). All health facilities and health-related employers under RAKEZ jurisdictional areas shall have a valid NOC from MOHAP as per the requirement of Federal Law No. (4) of 2015 before starting any work/operation. All these employers shall comply with appropriate recognised standards for both design and construction.

6. General Goods Storage & Handling

6.1. General Requirements

The employer shall ensure the following, but not limited to:

a. Storage arrangements shall consider how forklift trucks and other vehicles operate in and around the storage area;

b. Work activities shall be conducted in such a manner that property, electrical systems, or the fire and life safety system are not damaged or obstructed in any way;

c. Arrange storage areas to give good visibility for pedestrians and vehicles. It may be necessary to position mirrors around the area or provide extra mirrors on vehicles to reduce blind spots;

d. Pedestrians shall use designated walkways, segregated from vehicles where possible, and be excluded from active stacking areas. Stacking areas shall have adequate lighting;

e. A one-way traffic system and speed restrictions may add to site safety;

f. Roadways or aisles shall be clearly defined and strong enough to withstand the weight of loaded vehicles;

g. Ensure roads/aisles and floor surfaces are maintained;

h. Fit reversing alarms to vehicles with restricted rear vision;

i. Stack conditions shall be regularly monitored by competent employees that can identify stack faults.

6.2. Commodities Storage

A variety of systems are used for storing goods, from pallets to static racking. The method of storage depends on the shape and fragility of the materials. Long thin materials are generally stored in some form of horizontal racking and box-shaped articles or loose materials in sacks built into a stack, with suitable bonding to ensure stability.

Cylindrical objects can be stored on their sides or at an end. When such objects are stored on their sides, the floor-level tier should be properly secured to prevent movement. Subsequent tiers can rest on the preceding one or be laid on battens and wedged.

Where materials are handled by equipment or vehicles, they should be placed on battens or other suitable material, so that the forks can be inserted. Most materials can be palletised and stacked as complete pallet loads or stored on pallet racking.

6.3. Storage of Hazardous Substances

The storage of hazardous substances in substantial quantities may create serious risks, not only to employees working at the warehouse but also to the general public, property, and the environment.

The precautions needed by the employer to achieve a reasonable standard of control should consider the properties of the substances to be stored. Different hazardous substances create different risks and it is important that the standards adopted are based on an understanding of the physical and chemical properties of the substances concerned and the potential reactions between substances.

Other important factors are the overall quantities of the substances to be stored and the maximum size of individual packages.

The incidents that cause the greatest concern are generally those that involve fire and explosion. Such fires expose employees, the emergency services, and members of the public to the threat of heat, harmful smoke, and fumes, flying missiles, and explosion. Fires can also cause the substances to be spread over a wider area through smoke and water used to fight the fire, thereby being harmful to the surrounding community and the environment.

The employer responsible for storage areas where hazardous substances are to be stored, must before undertaking such storage, assess the risks created and the control measures required to control these risks

The employer should ensure that the risk assessment should be periodically reviewed and when the types of substance, total quantities, or storage conditions change.

The employer shall comply also with the requirements of Section 7 - Control of Hazardous Substances.

7. Control of Hazardous Substances

This section shall be complied with by all employers/employees/consultants/contractors to ensure the implementation of the necessary safety, health, and environmental protection measures for hazardous substances.

This section is also intended to supplement, not replace, any existing codes and regulations of both local and federal authorities, particularly Federal Law No. 24 of 1999 and its subsequent executive orders. Owners of hazardous substances shall comply with all other relevant legislation as and when applicable. Before commencing physical operations in the employer's facility and obtain certificates of approval in the form of an operations fitness certificate (OFC). NOC for import / storage of chemicals (HSE-GU02.F01) shall be obtained from RAKEZ HS&E Department, for guidance please refer the Guidance to obtain HSE NOC (HSE-GU02).

This section is presented for the benefit and consideration of the employers/users and not to limit how risk can be minimised or eliminated. This section is aimed to ensure the containment of all spills and accidental losses of a

hazardous substance or its wastes from storage systems are provided with the objectives of (i) environmental protection (air, surface, and groundwater); (ii) personnel protection; and, (iii) fire protection. In applying this section, consideration shall be given to the potential for releases to enter the natural environment, including sewer systems, concerning applicable sections of the RAKEZ regulations adopted as per the degree of risk, e.g., indoor tanks remote from exterior doors and sewer drains may not require the same degree of secondary containment as an outdoor tank.

7.1. Description

A hazardous substance is a material that has the potential to cause harm if they are inhaled, ingested, or comes into contact with, or is absorbed through the skin. Hazardous substances have many forms – solid, gas, liquid, fume, dust, vapor, mist, and smoke. These include individual chemical substances or preparations such as paints, cleaning materials, metals, pesticides, and insecticides. A substance hazardous to health means any substance which is:

a. A substance which is included in the UN classification of dangerous goods and for which the general indication of risk is specified a toxic, harmful, corrosive, irritant, sensitizing, carcinogenic, mutagenic, or toxic to reproduction;

b. A substance for which a maximum exposure limit is specified in Federal Law No. 24 of 1999, Federal Law No. 12 of 2018, and subsequent executive orders/decrees;

c. A micro-organism or biological agents such as pathogens or cell cultures which create a hazard to the health of any person;

d. Dust of any kind, when present at a substantial concentration in the air;

e. A substance not mentioned above, which creates a hazard to the health of any person which is comparable with the hazards created by the substances mentioned above.

Substances not hazardous to health may still be classified as a dangerous substance by nature of being flammable, explosive, or oxidising, etc.

7.1.1 UN Classifications

Each receptacle containing dangerous goods shall be marked with the correct technical name and identified with a distinctive label or stencil of the label to make clear the dangerous character. Each receptacle shall be labelled according to the classification of dangerous goods as per UN Classification – Globally Harmonised System of Classification and Labelling of Chemicals United Nations (GHS) (Refer to Table 7-A).

In all documents relating to dangerous goods, the correct technical name of the goods shall be used, and the correct description given in accordance with the UN goods classification.

In addition to the four-digit UN Number, a substance must be assigned to a class depending on that substance's characteristics and the type of hazard involved during its transportation, handling, and storage. The UN has devised a classification system that forms the basis for the hazard classes of all the

main transport codes. Where necessary, these classes are further subdivided into divisions to allow more specific classification.

Table 7-A: UN Classification of Dangerous Goods

Class 1: Explosives

An explosive substance (or mixture) is a solid or liquid substance that is in itself capable through a chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Explosive substances are assigned to one of the following six divisions depending on the type of hazard they present:

a. Class 1.1 Explosives: Substances, mixtures, and articles which have a mass explosion hazard that affects almost the entire quantity present virtually instantaneously, e.g. nitro-glycerine/dynamite, ammonium nitrate, trinitrotoluene;

b. Class 1.2 Explosives: Substances, mixtures, and articles which have a projection hazard but not a mass explosion hazard, e.g. detonating fuses, rocket motors, hand grenades);

c. Class 1.3 Explosives: Substances, mixtures, and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard, e.g. display fireworks, smoke grenades);

d. Class 1.4 Explosives: Substances, mixtures, and articles that present no significant hazard, but create only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected, e.g. blasting caps, consumer fireworks, proximate pyro);

e. Class 1.5 Blasting Agents: Substances and mixtures which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or transition from burning to detonation under normal conditions, e.g. Type E water emulsion blasting agents);

a. Class 1.6 Explosives: Extremely insensitive articles which do not have a mass explosion hazard and which demonstrate a negligible probability of accidental initiation or propagation.

 Class 1.1: Explosives	 Class 1.2: Explosives	 Class 1.3: Explosives
 Class 1.4: Explosives	 Class 1.5: Blasting Agents	 Class 1.6: Explosives

Class 2: Gases

Gases that are compressed, liquefied, or dissolved under pressure. Class 2 is sub-divided as follows:

a. Class 2.1 Flammable Gas: Gases that ignite on contact with an ignition source, e.g. acetylene, hydrogen, and propane);

b. Class 2.2 Non-Flammable Gases: Gases that are neither flammable nor poisonous. Includes the cryogenic gases/liquids (temperatures of below -100 °C) used for cryopreservation and rocket fuels, e.g. nitrogen, neon, and carbon dioxide);

c. Class 2.3 Poisonous Gases: Gases liable to cause death or serious injury to human health if inhaled, e.g. fluorine, chlorine, and hydrogen cyanide).

 Class 2.1: Flammable Gas	 Class 2.2: Non-Flammable Gas	 Class 2.3: Poisonous Gas
 Class 2.2: Oxygen (Alternate Placard)	 Class 2.3: Inhalation Hazard (Alternate Placard)	

Class 3: Flammable Liquids

Flammable Liquids are liquids having a flash point of not more than 93 °C. Class 3 is subdivided as follows:

a. Packing Group I, if they have an initial boiling point of 38°C or less at an absolute pressure of 101.3 kPa and any flash point, e.g. diethyl ether and carbon disulphide);

b. Packing Group II, if they have an initial boiling point greater than 38°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C, e.g. gasoline (petrol) and acetone);

c. Packing Group III, if the criteria for inclusion in Packing Group I or II are not met, and a having a flash point of not more than 93 °C, e.g. kerosene and diesel).

 Class 3: Flammable Liquids	 Class 3: Combustible (Alternate Placard)	 Class 3: Fuel Oil (Alternate Placard)
	 Class 3: Gasoline (Alternate Placard)	

Class 4: Flammable Solids

Flammable solids are any materials in the solid phase of matter that can readily undergo combustion in the presence of a source of ignition under standard circumstances. Class 4 is subdivided as follows:

a. Class 4.1 Flammable Solids: Solid substances that are easily ignited and readily combustible, e.g. nitrocellulose, magnesium, safety, or strike-anywhere matches);

b. Class 4.2 Spontaneously Combustible: Solid substances that ignite spontaneously, e.g. aluminium alkyls, white phosphorus);

c. Class 4.3 Dangerous When Wet: Solid substances that emit a flammable gas when wet or react violently with water, e.g. sodium, calcium, potassium, calcium carbide).

 Class 4.1: Flammable Solids	 Class 4.2: Spontaneously Combustible Solids	 Class 4.3: Dangerous When Wet

Class 5: Oxidising Substances (Agents) and Organic Peroxides

Oxidisers are substances that readily yield oxygen in reactions, thereby causing or enhancing combustion. Class 5 is subdivided as follows:

a. Class 5.1 Oxidising Agent: these are substances which although in themselves not necessarily combustible, may either be yielding oxygen or by similar processes, increase the risk and intensity of the fire in other materials with which they come into contact, e.g. calcium hypochlorite, ammonium nitrate, hydrogen peroxide, potassium permanganate);

b. Class 5.2 Organic Peroxides: Most substances in this class are combustible. They may act as oxidising substances and are liable to explosive decomposition. In either liquid or solid form, they may react dangerously with other substances. Most will burn rapidly and are sensitive to impact or friction, e.g. benzoyl peroxides, cumene hydroperoxide).

 Class 5.1: Oxidising Agent	 Class 5.2: Organic Peroxide Oxidising Agent	

Class 6: Toxic and Infectious Substances

Toxic and infectious substances are materials, other than a gas, known to be so toxic to humans that it presents a health hazard. Class 6 is subdivided as follows:

a. Class 6.1 Toxic substances: the substances in this class are liable to cause death or serious injury to human health if swallowed, inhaled, or by skin contact, e.g. potassium cyanide, mercuric chloride);

b. Class 6.2 Biohazard: these are substances containing disease-producing organisms, e.g. virus cultures, pathology specimens, used intravenous needles).

 Class 6.1: Poison	 Class 6.2: Biohazard	

Class 7: Radioactive Substances	Class 8: Corrosive substances	Class 9: Miscellaneous

Radioactive substances are materials that emit radiation, e.g. uranium, plutonium).	Corrosive substances are materials that can dissolve organic tissue or severely corrode certain metals, e.g. Acids: sulfuric acid, hydrochloric acid, and Alkalis: potassium hydroxide, sodium hydroxide).	Miscellaneous Dangerous Substances are materials that do not fall into the other categories (asbestos, air-bag inflators, self-inflating life rafts, dry ice).
 Class 7: Radioactive	 Class 8: Corrosive	 Class 9: Miscellaneous

7.2. Not Permitted Activities

Activities and materials in the below list shall not be permitted within RAKEZ premises:

a. Employers storing/manufacturing/processing any explosives (Class I) as per The U.S. Occupational Safety and Health Administration (OSHA) which are equivalent to Class 1 Explosives, 4 Flammable Solids, and 5.2 Organic Peroxide Oxidising Agent as per UN Classifications for Dangerous Goods (refer to Table 7-A);

b. Activities that include storing or processing chemicals classified as "banned materials" as per Integrated Hazardous Materials Management System (IHMMS) – Government of Abu Dhabi (Refer to https://www.hazmat.ae/);

c. Importing hazardous wastes defined in Basel Convention Protocol and as per Article 62 of Federal Law No. (24) Of 1999 for the protection and development of the environment.

7.2.1 Conditional Permission

The activities cannot be permitted and/or discouraged – prima facie – for being set up owing to their inherent and potentially unacceptable degree(s)/magnitudes of risks, hazards, and perennial problems that can pose threat to or can be detrimental to the proprietary business interests of RAKEZ. A special/temporary approval shall be obtained from the concerned authorities (MOI, EPDA, MOHAP, Civil Defence, etc.) before proceeding with the RAKEZ licence issuance process. Such risks, hazards, and problems have been identified in the terms as outlined below:

a. Activities utilising toxic, carcinogenic, or poisonous substances in their process, e.g. arsenic, aflatoxins, coal tar fumes, 2-naphthylamine, benzidine, 4-nitrodiphenyl, 4-aminodiphenyl, and vinyl chloride monomer;

b. Industries with potential for toxic gas release/occupational health diseases;

c. Activities that generate chemical odours, e.g. mercaptans, volatile organics, chlorine, hydrogen sulphide, and ammonia;

d. Activities with a large potential generation of waste (solid, liquid, airborne) and no established plan for recycle- reuse-recovery and treatment of the same;

e. Activities that need intensive manpower requirements;

f. Industries with visible emissions and/or housekeeping problems;

g. Industries with high noise and vibration.

7.3. Permitted Activities

a. Permitted activities as per location/lease are listed in Table 7-B;

Table 7-B: Permitted Activities as Per the Location/Lease

Grade 1 Permitted Activities Only in A Land-Plot	Grade 2 Permitted Activities in A Warehouse Equipped with FLS Sprinkler	Grade 3 Permitted Activities in A Warehouse Not Equipped with FLS Sprinkler
Activities classified as "High Severity" as per RAKEZ Risk Categorization of the Activities	Activities classified as "Medium Severity" as per the RAKEZ risk categorisation of the activities	Activities classified as "Low Severity" as per the RAKEZ risk categorisation of the activities
Activities that include storing or processing chemicals classified as "Restricted Materials" as per Integrated Hazardous Materials Management System (IHMMS) – Government of Abu Dhabi *	Activities that include storing or processing chemicals that are NOT classified as "Hazardous and Restricted Materials" as per Integrated Hazardous Materials Management System (IHMMS) – Government of Abu Dhabi *	Activities that include storing or processing chemicals that are NOT classified as "Hazardous and Restricted Materials" as per Integrated Hazardous Materials Management System (IHMMS) – Government of Abu Dhabi *
Activities that include storing or processing recyclable materials		

Note: (*) Refer to https://www.hazmat.ae /

b. Activities in Grade-2 and Grade-3 are permitted in Grade-1. Likewise, Grade-3 list are permitted in Grade-2;

c. The quantities of permitted chemicals shall not exceed 60% of the workplace area (any machinery installation shall be considered within this 60 %). In all cases, 40 % of the work area must be kept free from any materials/equipment to be used as passageways and escape routes in case of emergency. A minimum gap of 1.5 m shall be maintained clear between the tip of the stacked items and the lowest utility fixture in the roof;

d. The activities, so permitted, will be subject to strict compliances (including monitoring and control) with current Federal/UAE laws, local decrees, and the RAKEZ rules and regulations pertaining to health, safety, and environment so that the degrees and magnitudes of risks, hazards, and other related problems associated with them are maintained at an acceptable level(s) at all times.

7.4. General Requirements for Control of Hazardous Substances

The employer shall protect their employees and any other person, whether at work or not, who may be affected by the dangerous work carried on by the employer. Contractors, sub-contractors, and self-employed persons all have the duties of protection and so there shall be collaboration to make them aware of any substance on the premises which poses a danger or a risk to their health.

7.4.1 Duties & Liabilities

a. UAE Ministerial Decision No. 32 of 1982 entitled "The Determination of Preventive Methods and Measures for the Protection of Labour from Risks of Works", identifies the responsibilities of employers for protecting employees and the environment. These include assessment of risks, measurements of pollution, training, information to employees, health measures and records, provision of protective clothing and other service facilities, etc;

b. The employer shall not carry out any work which is liable to expose any employees to any substance hazardous to health unless he has made a suitable and sufficient assessment of the risks created by that work to the health of those employees and of the steps that need to be taken. Employees or their representatives at the place of work shall be informed of the results of the assessment;

c. The employer shall ensure that the exposure of the employees to substances hazardous to health is either prevented or is adequately controlled. The prevention or adequate control shall be secured normally by measures other than the provision of personal protective equipment. However, where such practicable measures are not adequate to give sufficient control of exposure, the employer shall provide, also, suitable personal protective equipment. In the case of any substance appearing in Federal Law No. 24 of 1999, Federal Law No. 12 of 2018, and subsequent executive orders/decrees, it shall only be treated as adequate if the exposure is reduced below the maximum exposure limit, for which the employer shall undertake a monitoring program;

d. The employer who provides any control measures, personal protective equipment, or another facility shall take all reasonable steps to ensure that they are provided, inspected, maintained in an efficient state and that they are being used properly by employees. Every employee shall make full and proper use of any control measure or personal protective equipment or facility;

e. The employer who provides any control measures shall also ensure that they are in efficient working order by carrying out examinations and tests and by keeping a record;

f. Where it is appropriate for the protection of the health of the employees who are, or liable to be, exposed to a substance hazardous to health, the employer shall ensure that such employees are under suitable health surveillance and that a medical record is maintained;

g. The employees who are, or liable to be, exposed to a substance hazardous to health shall be provided by the employer with such information, instruction, and training as is suitable and sufficient to know the risks to health created by such exposure and the precautions which shall be taken;

h. The manufacturing of banned and restricted chemicals requires an EPDA Permit and it has to be controlled and monitored by the concerned ministries/federal authorities;

i. It shall be noted that from time to time various UAE ministries/federal authorities issue controlled and prohibited chemicals. It remains the responsibility of the employer to ensure that approvals from the various UAE ministries/federal authorities are obtained to deal with such substances;

j. Importing banned and restricted chemicals to RAKEZ areas shall be permitted by HS&E Department, and this permit shall be issued after obtaining EPDA NOC for each shipment. EPDA NOC is required for importing banned and restricted chemicals from outside the UAE and it needs to have prior approval from concerned ministries/federal authorities as per Integrated Hazardous Materials Management System (IHMMS) – Government of Abu Dhabi (Refer to https://www.hazmat.ae/). EPDA NOC is required for buying, selling, and locally transporting any "banned or restricted chemical", also it is required to transport any chemicals from an emirate to another and from an employer to another to track the chemical by the concerned authorities. Importing radiation sources including radioactive materials is required as well to have a valid permit from FANR as per the requirement of FANR regulations. Upon obtaining EPDA's NOC the employer shall acquire the NOC from RAKEZ;

k. Occupational cancer is a special case of the general provisions mentioned above and it may arise from various causes not yet properly defined as a causal link between a particular chemical and cancer in humans. The principles of occupational health are no different for carcinogenic substances for those involving other health hazards. However, there are specific substances and processes with which a cancer hazard is associated and prevention of exposure must be the first object in view of the serious and often irreversible nature of the disease. Exposure shall be controlled to as low a level as is reasonably practicable, bearing in mind the high risk of death.

l. No chemicals and/or dangerous goods are permitted for storage/import without prior approval from RAKEZ. The storage area has to be approved and accordingly, the employer must obtain NOC for chemical storage/import from RAKEZ.

7.4.2 Engineering and Administrative Controls

a. Dangerous Chemicals of any type, fuel, oil, lubricants, grease, paints, thinner, perfumery products, and gases are not permitted for storing and handling in a pre-built warehouse or light industrial units. However, the same can be stored/handled/manufactured at the building/facility constructed at the plot of land;

b. There shall be no open storage of any type of chemical in the employer's premises and any such storage/placement shall be considered a serious violation of these rules and regulations;

c. Facilities are not permitted to be used for chemicals and/or dangerous goods storage without prior approval from HS&E Department along with the approvals from the relevant authorities (RAK Civil Defence and EPDA). Any drum, containers, or tanks that hold flammable liquids shall be stored undercover against direct sunlight, well ventilated, and equipped with firefighting services as approved by the RAK Civil Defence;

d. Perfumery products, alcohol, tires, and other highly flammable product storage/manufacturing such as cigarette lighters, etc. shall be stored at a controlled temperature;

e. Detailed engineering drawings for chemicals and/or dangerous goods storage tanks for all types of installations including underground, above ground, within or outside the building with storage tank capacity, location, piping, distribution, filling, gauzing and safe distances from the nearest building/property line and safety provisions, etc. shall be submitted to TSS Department to obtain prior approvals before the construction/installation;

f. The tank design and installation shall meet the requirement specified in NFPA 30, API, and ASME. The design verification report from a competent 3rd party consultant shall be submitted to TSS Department. Hydro test certification from the competent 3rd party for the tanks shall be submitted;

g. All storage facilities shall be designed, fabricated, installed, and provided with adequate protection in such a manner that the potential leak is eliminated/minimised. The degree to which measures are taken to ensure the integrity of a storage facility shall be dictated by the severity of the potential environmental, health, and safety effects of the loss of the product to be stored or possible subsequent fire/explosion;

h. For bulk chemical storage tanks, a risk assessment (RA) study has to be carried out by the employer through a RAKEZ-Registered RA consultant before the commencement of construction/operation. The same shall be checked/assessed by the HS&E Department during the operation fitness inspection of the facility;

i. Materials of construction of storage facilities shall be consistent with the safe long-term storage of the chemicals or industrial wastes under consideration;

j. Surface impoundments used to store hazardous materials shall be hard-surfaced and underlined with impervious lines and shall be designed with leakage monitoring and collection systems. Lining systems shall be liquid-tight, shall be compatible with the structure material and the substance stored in the structure, and shall generally comply with the criteria for construction and operation of surface impoundments. Surface impoundments shall not be used to store volatiles, ignitable or reactive materials;

k. All electrical, lighting fittings/fixtures, and wiring, etc. in hazardous chemical storage/handling/manufacturing warehouse/area shall be of dust and the explosion-proof type and shall meet the requirement of “NFPA 70: National Electrical Code”;

l. Changes in the chemicals or its process or part of operational wastes to be stored in a given facility shall not be permitted until approval from HS&E Department for such a change in the service is obtained;

m. Dangerous goods shall be separated from areas frequented by the public as per the following requirement in Appendix C;

n. The minimum safe distance (horizontal clearance) shall be maintained from the fence line to the walls of the covered warehouse/storage/factory building. For open warehouse/Dutch barn type building

minimum distance (horizontal clearance) shall be maintained. The flooring of the chemical storage warehouse shall be lined with chemical/acid resistant coating/lining. Minimum safe distances shall be maintained as per UAE Fire and Life Code of Practice;

o. Incompatible materials shall not be placed in common containment areas or the same containers. Refer to Sub-section 7.5.8 “Storage with Compatibility”;

p. Dangerous goods shall be segregated in the storage according to their dangerous classifications and requirements specified in Appendix C. Dangerous goods stored shall not share common bund areas unless the materials are of the same dangerous goods class;

q. Dangerous goods storage areas shall, where practicable, be external to the workplace. Where dangerous goods are stored within industrial premises, there shall be a minimum of 3 m separation to any production facilities for non-flammable materials and 10 m between flammable materials and any source of ignition;

r. Tanks shall be equipped with an alarm or warning device which will sound an audible warning or other suitable devices in the event the liquid level is exceeded;

s. The provision for fire runoff water/drainage collection system for chemical contaminated water for a minimum of 30 minutes of fire system operation shall be provided;

t. An adequate number of windsocks at prominent locations shall be provided;

u. The following measures for employees’ protection shall be considered at each chemical and waste storage facility:

    1. The storage area shall be operated in such a manner that the spreading of hazardous material within or outside the area is eliminated or minimised;

    2. The employer of the chemical and/or waste storage facility shall conduct a risk assessment, considering regulation respecting the control of exposure to biochemical or any chemical agents. The risk assessment shall include: details of engineering controls; work practices; hygiene facilities and practices; and personal protective equipment (PPE) required to be worn by the operator/carrier;

    3. Adequate measures shall be taken to prevent exposure of employees to toxic or harmful substances or agents, or oxygen-deficient or flammable atmospheres. Enclosed systems/tanks and confined space shall be labelled, safety procedures shall be developed, and the affected employees shall be provided familiarisation/training periodically. Any change in the enclosed systems/tanks and confined space safety procedure shall be communicated to the affected employees;

    4. All hazardous chemicals and substances shall be stored in a protected/secured place with limited access;

    5. Dangerous goods shall be stored safely with sufficient space for the safe movement of forklift vehicles or personnel;

6. Chemicals handling, storage, and instructions given in safety data sheets and product manuals, supplied by the manufacturer or supplier, shall be understood and followed strictly. It is the responsibility of the employer to obtain safety data sheets, share them with the concerned employees, and display them at prominent locations;

7. Safety and instruction sign for chemical handling is to be displayed at the chemical storage/handling area. Pictorial signage shall be used wherever practically possible;

8. Appropriate personal protective equipment (PPE) shall be provided to the workforce involved with chemical handling. PPE shall include the use of impervious gloves (type and material), coveralls, boots (rubber or safety), eye protection (safety glasses/chemical goggles), details of respiratory equipment (particulate respirator, half facepiece respirator, full-facepiece respirator, self-contained breathing apparatus or supply air respirator certified by NIOSH) whenever applicable;

9. The employer storing dangerous goods shall ensure that its employees are aware of the hazardous nature of such substances, and they shall be provided with training in procedures for handling spills and the proper use, care, and maintenance of any required PPE, including - whenever applicable- fit testing of respiratory equipment;

10. A de-contamination room with storage arrangement for PPE shall be provided for chemicals/dangerous goods manufacturing/storing/handling facilities;

11. All facilities for storing/handling/manufacturing chemicals/dangerous goods shall be provided with emergency eyewash with a quick drench shower;

12. Dangerous substances shall only be handled, stored, or stowed under the supervision of a responsible person at the supervisory level. Adequate information/briefing shall be given to employees concerned in the form of toolbox talk and recorded as special precautions to be observed. The briefing shall include actions to be taken in the event of a spillage or accidental escape from containment;

13. A container holding hazardous material shall always be closed during storage except when it is necessary to remove or add material;

14. All liquid hazardous chemicals store shall be provided with spill collection pits connected to appropriate HDPE-lined holding tanks;

15. If receptacles or containers of dangerous substances are broken or damaged to a dangerous extent, other than that necessary to eliminate danger, shall be stopped in the area concerned and the employees removed to a safe place until the danger has been eliminated;

16. Storage facilities shall be inspected regularly for leakage. The employer shall maintain at all times records of dangerous goods used/stored/traded and shall regularly update records of the HS&E Department on the same through OFC procedures.

7.4.3 Environmental Control

Specific environmental protection measures are required for all chemical facilities and their waste storage based on sound engineering principles taking into consideration the diverse risks, properties of the materials being stored, and the potential for releases to enter the natural environment that may cause health or safety hazards or nuisances.

a. Where possible, storage facilities shall not be located where, in the event of a spill, a waste product may enter a natural watercourse or a sewage or drainage system, or contaminate potable surface or groundwater supplies, or contribute to air contamination;

b. Reference to environmental regulations shall be made for strict compliance with the environmental requirements as mentioned therein and also as per EPDA standards including all applicable federal laws and regulations;

c. Storage sites shall be designed such that stormwater runoff from the rest of the site is diverted around storage areas. The runoff from the dike-enclosed storage areas shall be held for monitoring and treatment (if required) before discharge. The runoff water from storage areas shall meet the point source discharge criteria;

d. All dangerous goods shall be stored on impervious surfaces capable of containing spills. Some means of limiting the effects of leakage are:

    1. Facilities for collecting spilled liquid;
    2. Sand or suitable absorbing material for containment or absorption;
    3. Provision to seal leaking drums;
    4. A minimum of 2 mm thick HDPE liner shall be installed at the bottom of chemical/fuel/wastewater tanks to prevent leaks;
    5. Provision to rinse away spilled substance;
    6. Ventilation.

e. Areas for storage of hazardous material in any form (tanks, drums, solids, stockpiles, etc) shall have a containment system for collecting and holding spills and leaks. The entire area shall be impervious to the waste or its waterborne constituents. The volume of the containment/bund areas for the bulk storage tanks shall be 110% of the volume of the largest tank within the bunded area;

f. Where groundwater pollution potential exists, monitoring of the aquifers is required.

7.4.4 Emergency Preparedness Plan

Many chemicals and wastes can be hazardous to the environment if handled or stored improperly. To minimise environmental impacts, facilities shall have an emergency preparedness plan to deal with events such as chemical spillage, fires, explosions, vandalism, and other emergencies. The plan shall

address hazard identification; prevention measures, emergency planning, emergency response, and remedial actions. In developing an emergency preparedness plan consideration shall be given to:

a. Human health and safety shall take priority over environmental protection in cases of emergency;

b. Description of the location (including site plans, floor plans, etc.), type and amount of chemicals and/or wastes typically in storage, including reference to safety data sheets (SDS);

c. The chemical/waste storage area shall be established in a location accessible by fire fighting and other emergency response equipment;

d. Identification of environmental emergencies/hazards that can reasonably be expected to occur, the potential effects of an accidental release, and measures required to prevent or respond to the emergencies;

e. Description of the measures to be used to prevent an environmental emergency, including the location and type of firefighting and fire suppressions systems and spills containment measures, e.g. spill kits, secondary containment berms, double-walled storage tanks, etc.;

f. Maintenance and inspection requirements for preventive measures, e.g. containment system, emergency response, and personal protective equipment, and fire suppressions systems, including record-keeping requirements;

g. Contingency plans shall be established to deal with emergencies arising from the accidental discharge of hazardous materials. Adequate fire-fighting, safety, and spill control equipment shall be readily available. Personnel shall be trained to handle emergency procedures. Proper neutralising agents shall be made available to deal with any chemical discharge. The contingency plan shall also be developed in coordination with RAKEZ and other relevant authorities (EPDA, RAK Civil Defence, National Crisis & Emergency Management Authority, etc.);

h. Assignment of roles and responsibilities for activating, coordinating, and implementing the plan, including specific medical or rescue duties, fire/explosions response (including shutting down critical operations such as electricity, natural gas, etc.), evacuation and headcount procedures, spills response duties, requirements for personal protective equipment, reporting, recordkeeping, containment, clean-up, and disposal concerns;

i. Listing of emergency contact numbers for relevant facility employees or spill clean-up/response contractors; emergency responders and agency reporting requirements;

j. Community communication and notification requirements, including public education/information programs;

k. Training requirements for personnel activating, coordinating, and implementing the plan, including the provision of emergency response exercises (administrative, table-top drills, and operational exercises) and training on the use and maintenance of personal protective equipment;

l. Routine review and evaluation of the plan for effectiveness, including post-incident and post-drill review;

m. In an event of incidents involving spills, fires, and other releases or suspected leaks of gas, evacuate the facility or area. Activate the alarm and contact the RAK Civil Defence (999). Such incidents shall be immediately reported to the security section. Please refer Incident Notification Form (HSE-RR01.F01).

7.5. Storage & Handling

A variety of statutory regulations exists for the storage and handling of chemicals and dangerous goods. The precautions to be taken for different dangerous goods classes depending on their hazardous nature could be keeping the dangerous good separate from other goods classes, cool, in the dark, dry, in a fireproof place, under inert gas, in ventilation along the floor, or under inhibitors. The design and installation of such storage facilities shall be as per the UAE fire & life safety code. It may however be advisable to restrict the accessibility of certain chemicals and dangerous goods to those whose job it is specially to handle them, particularly if careless handling can have serious consequences.

7.5.1 Liquid Chemical Storage Tanks – Above Ground

a. Materials of construction of storage tank systems, foundations, dykes, and dyke accessories shall be consistent with safe long-term storage of the chemical or waste being stored;

b. Aboveground storage tank systems and foundations shall be protected from, or resistant to, all forms of internal and external wear, vibration, shock, corrosion, fire, heat, vacuum, and pressure which might cause the storage tank system or foundation to fail where failure could result in human loss and/or environmental damage;

c. Overhead piping is preferred over underground piping for filling tanks from the process or raw material sources such as tank cars or tank truck unloading stations. Shall underground piping be used, the piping shall be installed and protected in accordance with Guideline requirements for underground tank systems;

d. Overflow lines from tanks shall be extended to near the floor of the dike area;

e. Tank and piping connections of two different metals that create corrosion-inducing galvanic cells shall be avoided;

f. Consideration shall be given to reducing emission losses from fixed roof tanks by installing an internal floating roof and seals to minimise storage evaporative losses. For floating roof tanks, primary seals and secondary seals shall be provided and maintained in good repair to serve as a vapor conservation device by closing the annular space between the edge of the floating deck and the tank wall. Aboveground storage tanks and associated piping and equipment (storage tank system) shall be of sufficient structural strength to withstand normal handling and installed on foundation stable under all operating conditions;

g. The practice of placing gravel and spill absorbents around the base of the tank may increase the likelihood of bottom corrosion and shall be avoided. Bottoms of tanks that are in contact with soil and are subject to corrosion shall be protected from external corrosion by either corrosion-resistant materials or a cathodic protection system;

h. If the tank is lined or internally coated, the coatings shall be compatible with the substance stored, with coating specifications adhering to good engineering practice and relevant Standard requirements;

i. The exposed exterior surfaces of all aboveground tanks, piping, and ancillary equipment shall be protected from corrosion. Protection shall be provided by using one or a combination of corrosion-resistant materials, non-metallic cladding or coatings, cathodic protection, or paints. The design and installation of cathodic protection shall be in accordance with specified codes and standards;

j. Changes in the facility service shall not be permitted until approval from HS&E Department for such a change in the service is obtained;

k. Instrumentation shall be provided on all storage tanks and piping to and from the tanks to keep operating personnel informed as to the existing conditions. All remote or instrument-operated valves shall be set to fail in the safest position;

l. Alarms shall be provided to give warning of conditions, such as high pressures or liquid levels, which, if not corrected, may result in a spill;

m. For toxic and/or non-biodegradable materials a backup method of detecting high levels shall be provided;

n. Tanks shall be protected from over-pressurisation, excessive vacuums or thermal excursions that may be caused by operator error, filling, emptying, atmospheric temperature changes, reactions, pumping, refrigeration, heating, and fire exposure by one or a combination of:

- Open vents;
- Rupture discs;
- Pressure/vacuum relief devices gauges and controllers;
- Thermal alarms;
- Fail-safe vessel designs;
- Other means are determined by a qualified engineer.

o. Discharge from vents shall not terminate in, near, or underneath any building, if the discharge could pose a fire, health, or safety problem;

p. Locations of the various components of any chemical or waste storage system shall consider the safety of the operating personnel, public health and safety, and environmental protection;

q. Tanks, piping, and ancillary equipment shall be located in such a way as to protect them from physical damage that may result from moving vehicles;

r. All aboveground tanks shall be accessible by fire fighting and other emergency response equipment;

s. If an aboveground storage tank is not used for up to 180 days, the flow of the product into the piping shall be blocked or valves closed and locked to isolate the disused tank. The tank shall be gauged monthly for necessary/immediate action is required to maintain the safety of the tanks and their associated accessories;

t. When an aboveground storage tank is decommissioned permanently, the fluid content of the tank and all connected piping shall be emptied and the tank and connected piping made vapor-free followed by obtaining a gas-free certificate from RAKEZ approved 3rd party consultant;

u. Before reuse, a tank temporarily taken out of service shall be inspected to ensure it is in a safe condition;

v. Permanently closed tanks shall be decommissioned with measures implemented to remediate or manage any associated environmental contamination;

w. Secondary containment, with sufficient capacity to accommodate overfills and spills which are likely to occur during the transfer including leaks or spills from connections, couplings, vents, pumps, valves, and hose failure shall be provided for transfer loading/unloading areas. The secondary containment/bunded area shall be sufficient to contain 110% of the volume of the largest tank within the bund considering the free volume available after the deduction of submerged tanks volume/piping/civil works in the bunded area. The ground around the loading/unloading system area shall be sloped a minimum of 1.5% toward a containment system;

x. The floor of the secondary containment shall consist of good quality, impervious concrete with a 2 mm HDPE liner, and a peak detection system is required;

y. Where secondary containment is not provided, alternate measures offering an equivalent level of protection shall be implemented to reduce spill risk;

z. All the personnel involved in the transfer and loading/unloading operation shall be provided with personal protective equipment as required to protect against any associated hazards. A procedure shall be in place to ensure that the personnel is trained for using such equipment during the transfer and loading/unloading operation;

aa. All connections shall be leak-free, undamaged, and fully functional, and checked for leakage before and after the transfer has been initiated;

bb. During unloading/loading from/to a tank vehicle, brakes shall be set and wheels shall be chocked;

cc. Where a fire hazard exists, sources of ignition shall be controlled;

dd. Where a product transfer line or fill line is not drained of liquid upon completion of a transfer operation, the line shall be equipped with a valve such as a dry disconnect shutoff valve that prevents discharges from the line;

ee. Where back-siphoning or backflow is possible where the flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than its intended source, fill pipes shall be equipped with a properly functioning check valve, siphon break, or equivalent device or system which provides automatic protection against backflow;

ff. Overfill and spill prevention equipment and practices shall be employed for all storage tank fill systems, and could include one or more of:

- Operator controls;
- High-level alarms or trips;
- Automatic by-pass to an overflow tank if the overflow tank is equipped with overflow protection;
- Other equivalent systems for preventing overfills.

gg. Where feasible, consideration shall be given to the use of vapor balance systems to minimise emissions (working losses) generated during the loading/unloading of tanks and the dispensing of products from tanks;

hh. Submerged fill shall be used where practical to reduce vapor losses during loading/unloading operations;

ii. Periodic inspection/testing of the storage tanks shall be carried out to assess the mechanical integrity of the vessel/tank. An inspection program risk-based inspection (RBI) is to be developed after systematic evaluation of both the likelihood of failure and the associated consequences of failure for each equipment:

- External Inspection: A visual examination/evaluation of the exterior surface, structure, foundations, and insulation of a pressure vessel or tank to determine the apparent condition and to establish the suitability of the vessel or tank for continued operation;
- Internal Inspection: An examination/evaluation of the interior surface and structure of a vessel or tank using visual and/or non-destructive examination procedures to determine the physical conditions and to establish the suitability of the vessel or tank for continued operation;
- On-Stream Inspection: An examination/evaluation performed from outside of a pressure vessel or tank using non-destructive examination procedures to determine the apparent condition and to establish the suitability of the vessel or tank for continued operation;
- All the inspection/testing records and reports shall be maintained and will be required to be presented as and when required by RAKEZ.

7.5.2 Liquid Chemicals Storage Tank – Underground

a. In locating the components of any underground chemical or waste storage system the safety of the operating personnel, public health and safety, and environmental protection shall be considered. Consideration shall be given to nearby underground infrastructure (such as underground pipes, sewers, and wires/cables);

b. Materials of construction of storage tank systems shall be consistent with safe long-term storage of the chemical or industrial liquid waste being stored;

c. Underground storage tank systems and foundations shall be protected from, or resistant to, all forms of internal and external wear, vibration, shock, corrosion, fire, heat, vacuum, and pressure which might cause the storage tank system or foundation to fail where failure could result in human loss and/or environmental damage;

d. Underground storage tanks and associated piping and equipment (storage tank system) shall be of sufficient structural strength to withstand normal handling and installed on foundation stable under all operating conditions;

e. Steel underground storage tanks and piping which are in contact with soil shall be protected from corrosion using one or a combination of corrosion-resistant materials or cathodic protection. Design and installation of cathodic protection, monitoring, isolation from stray currents, and sacrificial anodes shall be as per specified codes and standards;

f. Tank and piping connections of two different metals that create corrosion inducing galvanic cells shall be avoided;

g. If the tank is lined or internally coated, the coatings shall be compatible with the substance stored, with coating specifications adhering to good engineering practice and relevant standard requirements;

h. Changes in the facility service shall not be permitted until approval from the HS&E Department for such a change in the service is obtained;

i. Instrumentation shall be provided on all storage tanks and piping to and from the tanks to keep operating personnel informed as to the existing conditions;

j. For toxic and/or non-biodegradable materials a backup method of detecting high levels shall be provided;

k. All remote or instrument-operated valves shall be set to fail in the safest position;

l. If an underground storage tank is temporarily removed from service, routine inspections, at least monthly, shall be conducted to verify that the fill pipe caps and dispensers are secured and locked, no loss of product or water infiltration has occurred, the tank has not been dislodged, and corrosion protection systems are operating. Shall this situation be anticipated for an extended period, e.g. greater than 180 days tank contents shall be removed and purged followed by testing and certification of an approved 3rd party;

m. Before reuse, a tank temporarily taken out of service shall be inspected to ensure it is in a safe condition for use;

n. Permanently closed tanks shall be removed and decommissioned where possible, with measures implemented to remediate or manage any associated environmental contamination or residual risk shall the tank be left in place;

o. Underground storage tanks shall be monitored for leakage using one or more of the following methods:
   - Inventory monitoring;
   - Routine monitoring of the interstitial space of a double-walled tank;
   - Vapor wells for monitoring soils in the excavation zone;
   - Groundwater monitoring wells;
   - Automatic tank gauging equipment;
   - Other equivalent methods as approved by relevant codes and standards.

p. All leak detection systems shall be designed by qualified engineers according to applicable international codes and standards acceptable to relevant authorities;

q. Transferring, loading, unloading, and periodic checking of the underground storage tank shall follow the applicable requirements specified in the sub-section 7.5.1 (between clauses “w” to “ii”).

7.5.3 Storage of Gases and Volatile Liquids

a. The design, installation, and testing shall comply with NFPA 54, NFPA 58, IGEM (Institution of Gas Engineers and Managers);

b. In locating the components of any underground chemical or waste storage system the safety of the operating personnel, public health and safety, and environmental protection shall be considered. Consideration shall be given to nearby underground infrastructure (such as underground pipes, sewers, and wires/cables);

c. Storage facilities for volatile substances shall be covered, and venting systems shall be designed to prevent violation of air pollutant source emission criteria;

d. All FRP/GRP/Plastic underground tanks shall be encased with concrete encasement. A proper leak detection system shall be installed to detect any leakage;

e. Materials of construction of storage tank systems shall be consistent with safe long-term storage of the chemical or industrial liquid waste being stored;

f. Underground storage tank systems and foundations shall be protected from, or resistant to, all forms of internal and external wear, vibration, shock, corrosion, fire, heat, vacuum, and pressure which

might cause the storage tank system or foundation to fail where failure could result in human loss and/or environmental damage;

g. Underground storage tanks and associated piping and equipment (storage tank system) shall be of sufficient structural strength to withstand normal handling and installed on foundation stable under all operating conditions;

h. Steel underground storage tanks and piping which are in contact with soil shall be protected from corrosion using one or a combination of corrosion-resistant materials or cathodic protection. Design and installation of cathodic protection, monitoring, isolation from stray currents, and sacrificial anodes shall be as per specified codes and standards;

i. Tank and piping connections of two different metals that create corrosion-inducing galvanic cells shall be avoided. All pipelines shall be marked and color-coded and shall be checked and maintained frequently;

j. If the tank is lined or internally coated, the coatings shall be compatible with the substance stored, with coating specifications adhering to good engineering practice and relevant standard requirements;

k. Changes in the facility service shall not be permitted until approval from the HS&E Department for such a change in the service is obtained;

l. Instrumentation shall be provided on all storage tanks and piping to and from the tanks to keep operating personnel informed as to the existing conditions;

m. For toxic and/or non-biodegradable materials a backup method of detecting high levels shall be provided;

n. All remote or instrument-operated valves shall be set to fail in the safest position;

o. If an underground storage tank is temporarily removed from service, routine inspections, at least monthly, shall be conducted to verify that the fill pipe caps and dispensers are secured and locked, no loss of product or water infiltration has occurred, the tank has not been dislodged, and corrosion protection systems are operating. Shall this situation be anticipated for an extended period, e.g. greater than 180 days tank contents shall be removed and purged followed by testing and certification of an approved 3rd party;

p. Before reuse, a tank temporarily taken out of service shall be inspected to ensure it is in a safe condition for use;

q. Permanently closed tanks shall be removed and decommissioned where possible, with measures implemented to remediate or manage any associated environmental contamination or residual risk shall the tank be left in place;

r. Underground storage tanks shall be monitored for leakage using one or more of the following methods:

- Inventory monitoring;
- Routine monitoring of the interstitial space of a double-walled tank;
- Vapor wells for monitoring soils in the excavation zone;
- Groundwater monitoring wells;
- Automatic tank gauging equipment;
- Other equivalent methods as approved by relevant Codes and Standards.

s. The employer shall ensure that maintenance manuals and contractual agreement(s) with concerned agencies are put in place for initial and subsequent regulatory approvals. The maintenance program shall include – among other things – biennial (2 yearly) integrity inspections, tests, and certifications;

t. 3rd party inspections, tests, and certifications shall be carried out through competent agencies of international repute.

u. All leak detection systems shall be designed by qualified engineers as per specified codes and standards;

v. Transfer, loading, offloading and periodic checking of the underground storage tank shall follow the applicable requirements specified in the sub-section 7.5.1 (between clauses "w" to "ii").

7.5.4 Liquefied Petroleum Gas (LPG) Cylinders

This section covers outdoor and indoor portable LPG cylinders installations and storage. It is intended for commercial, industrial, and residential premises. NOC for usage of LPG cylinder (HSE-GU02.F04) shall be obtained from RAKEZ HS&E Department for further information refer to the Guidance to obtain HS&E NOC (HSE-GU02).

a. The following factors shall be taken into consideration while designing for the installation and use of LPG cylinders:
   - Adequacy of ventilation (Natural Open Ventilation Area);
   - The extent of usage of individual rooms;
   - Existing fire hazards, a possible source of heat and ignition;
   - Suitable means of escape;
   - Firefighting equipment and provisions.

b. The LPG cylinders installations shall be approved by RAK Civil Defence. All LPG cylinders installations in commercial or industrial premises, including their Manifold/piping systems, gas-leak detection system, and ancillary fittings shall be designed, fabricated, and tested as per the relevant clauses of NFPA 54, NFPA 58, and British standard (BS 3016 and BS 5345) and (UL) listed;

c. LPG cylinders installations shall be located outdoors and on the ground levels for all commercial and industrial buildings. Locating LPG cylinders indoors is not permitted unless otherwise approved by the HS&E Department under special circumstances;

d. LPG cylinders shall be placed in a vertical position on a firm, clean, dry, and level base. They shall be placed at ground level and in a well-ventilated area where any gas leakage can safely and rapidly disperse. They shall not be placed close to any passageways or exits and shall not cause any obstruction or danger to the occupants and public during gas leakage or fire;

e. The LPG cylinders shall be located at least 3 m horizontally away from any fire exit route, boundary, fire pump access way, any openings (windows, doors, air vents, balanced-flue outlets, openings to basements, etc.) of a building having only one exit. If the 3 m distance cannot be complied with, a 2-hr fire-rated masonry wall shall be provided between the fire exit or the openings and the LPG installation to achieve the equivalent 3 m horizontal distance. The masonry wall shall be at least 1.8 m high;

f. A minimum distance of 3 m shall be maintained from the edge of a vehicle/car parking lot. LPG cylinders shall be located at least 10 m away from any fire hydrant. There shall be no possible heat and ignition source within 3 m of the cylinder installation. It shall be located at least 6 m away from any corrosive, combustible, toxic, oxidising materials or other cylinders;

g. LPG cylinders shall be located at least 5 m horizontally away from any mechanical air intake which is below any part of the manifold system and 3 m from any mechanical intake which is above any part of the manifold system;

h. LPG cylinders located in places accessible to the public shall be protected and locked against tampering and accidental damage by fencing of height not less than 1.8 m, a suitable housing, or a cabinet made of non-combustible material. The cylinder storage cabinet shall be:

   - 0.11'' (2.66 mm) steel minimum with self-closing doors and self-closing limited-access ports or non-combustible windows to access equipment controls;
   - Shall be protected from extreme weather by a non-combustible shelter;
   - Placed directly on a firm floor;
   - Adequately ventilated with openings at the bottom of the cabinet.

i. For LPG cylinders installation involving a mechanical ventilation system and/or fire suppression system, a separate mechanical ventilation plan and/or fire protection plan shall be submitted to the HS&E Department for approval;

j. All fixed electrical equipment within 1.5 m of the installation shall be spark-proof and intrinsically safe in accordance with the relevant clause in NFPA 54, 58, and 70;

k. A minimum of two 9 kg ABC dry powder type fire extinguishers to be installed near the gas cylinder storage area;

l. The remote emergency shut-off valve shall be located at least 3 m away from the edge of the installation. It shall be clearly marked and placed at a suitable height for easy access during emergencies;

m. If a car parking is near the LPG storage – crash barriers guards shall be installed;

n. The gas sensors shall be explosion-proof and UL listed.

7.5.5 Compressed Gas Cylinders

Compressed gas cylinders are widely used in "fabrication, pilot plant, laboratory, small scale manufacturing, and processing operations as a way to provide a convenient, economical and safe source of high-pressure gases for various applications. These gases can be inert, flammable, toxic, or oxidising (or a mixture of any or all) and are typically supplied at pressures ranging from 800 psi. to 6,000 psi. with 2,500 psi. being common. Common Gas cylinder sizes and heights vary between 12'' till 54''.

a. Any work involved storing, handling, transporting and compressed gases shall be carried out by a competent person;

b. All compressed gas cylinders received, used, or stored shall be legibly marked to identify the gas content, with either the chemical or the trade name of the gas. Such marking shall be by stencilling, stamping, or labelling, and shall not be readily removable. It is the manufacturer's and shipper's responsibility to label the cylinder;

c. All labels of the industrial gas cylinders shall be identified by color-coding to distinguish the content and hazard involved (such as flammable, toxic, or corrosive substances). A cylinder without an appropriate label shall not be accepted. The cylinder shall be marked "contents unknown" and returned directly to the manufacturer if the labelling on the cylinder becomes unclear or an attached tag is defected to the point the contents cannot be identified;

d. The date of manufacturing or last hydrostatic test shall be clearly and legibly displayed on cylinders;

e. Storage, use, and handling areas shall be secured against unauthorised entry or access to unauthorised personnel;

f. Rooms or cabinets containing compressed gases must be conspicuously labelled "compressed gas". The cylinder storage area must be prominently posted with the hazard class and the name of the gases stored. Ensure that storage rooms are fire-resistant, dry, cool, and well ventilated;

g. When gases of different types are to be stored in the same location, cylinders shall be grouped by the type of gas. Cylinders shall be stored a minimum of 6 m (20') from any flammable and/or incompatible materials, e.g. oxygen and acetylene or other forms of fuel/flammable gas cylinders), and a minimum of 3 m (10') with combustible materials, unless there is a fire-resistive partition between them is provided as per UAE fire and life safety code of practice;

h. The empty cylinder shall be marked "empty" and shall be stored apart from full cylinders while waiting to be removed;

i. Cylinders shall be shaded from the direct sun rays. Cylinders shall not be exposed to extreme temperature (above 51 ˚C), spark-producing electrical tools, cigarettes, open flame, and or other sources of heat, e.g. furnace/boilers nor stored in the vicinity of combustibles, excessive dampness, or corrosive chemicals/fumes;

j. All the electrical fixtures shall be of explosion-proof material in a flammable gas storage area;

k. All gas cylinders shall be capped with protective guards and secured in an upright position when stored. The nesting of cylinders is not permitted;

l. All cylinders must be stored, used, and transported upright, and must be securely fastened using chains or a clamp-plus-strap assembly to prevent them from falling or being knocked over. Suitable racks, straps, chains, or stands are required to support the cylinders;

m. Cylinders shall not be dropped or be allowed to be struck/hit violently. Cylinders shall not be stored near elevators or gangways, or in locations where heavy moving objects may strike or fall on them. Cylinders shall be protected from any object that will produce cut or other abrasions on the surface of the metal;

n. Cylinders shall not be moved by rolling, dropping, carrying, sliding, or dragging them across the floor. Cylinders shall not be moved with a regulator attached;

o. All cylinders must be in good condition and shall be used with a correct and operable regulator, valve, and pressure gauge. Regulators and pressure gauges shall be used only with gases for which they are designed and intended;

p. Cylinders and associated safety devices shall not be tampered with. All safety devices shall be protected with covers where there is a likelihood of damage;

q. All parts of a compressed gas cylinder shall be inspected before use. An appropriate liquid solution shall be used to check for leaks. Under no circumstances shall any attempt be made to repair a cylinder or valve;

r. Only approved tools shall be used to open or close cylinder valves. Wrenches/hammers or any other tools in opening valves equipped with handwheels are not allowed to be used for such open or closed cylinder valves. Spark proof tools shall be used when working with flammable gas cylinders;

s. Oil or grease is not allowed to be used as a lubricant on valves or attachments of oxygen cylinders. Oxygen cylinders and fittings shall not be handled with oily hands, gloves, or clothing;

t. Cylinders are not allowed inside any confined spaces or unventilated rooms;

u. “Flashback arrestor and non-return valve” shall be provided for the cutting set (fuel gas and oxygen cylinder being used);

v. Cylinders shall be placed with the valve accessible at all times. The main cylinder valve shall be closed as soon as it is no longer necessary that it be open (i.e. It shall never be left open when the equipment is unattended or not operating);

w. If more than one cylinder has to be lifted, “a properly designed and certified cradle shall be used”;

x. All vehicles transporting compressed gas cylinders shall be approved by MOI for the same purpose.

7.5.6 Storage of Solid Chemicals

a. Bulk solids (not in containers or packages) shall be stored inside the facility. If this is not feasible, then all outside storage areas shall be covered with a roof, and beamed, or enclosed to prevent stormwater contact. The enclosure shall be designed to withstand storms and be anchored into the ground;

b. Stockpiles of raw materials shall be covered and contained to prevent stormwater from running into the covered piles. The covers shall be in place at all times when work with the stockpiles is not occurring. (Applicable to small stockpiles only);

c. If the stockpiles are so large that they cannot feasibly be covered, erosion control practices shall be applied at the perimeter of the site and at any catch basins to prevent erosion of the stockpiled material off-site;

d. In siting and orienting stockpiles, consideration shall be given to prevailing wind conditions. Stockpiles shall be protected from wind erosion by using a sheltered area or crust-forming agents;

e. Storage area locations will normally be based on process needs and accessibility to materials to provide optimum handling and transportation. However, in locating the storage area, consideration shall be given to the hazards associated with the flammability, and toxicity of the chemical or waste and relevant Codes and Standards acceptable to the EPDA, RAK Civil Defence, and other authorities having jurisdictions;

f. The packages of solid chemicals shall be well-made, in good condition, capable of withstanding the ordinary risks of handling, and of such a character that any interior surface with which the contents may come in contact is not dangerously affected by the substance being conveyed;

g. The storage area shall be located in such a way as to protect containment structures and packages and stockpile of the material from moving machinery and vehicles.

7.5.7 Drums and Non-Stationery Containers

a. Storage of drums containing flammable liquids inside and outside buildings and shelters, e.g. number of drums per stack, the maximum number of drums, RAK Civil Defence access ways shall be in line with the applicable codes and standards acceptable to EPDA and RAK Civil Defence;

b. Storage area locations will normally be based on process needs and accessibility to materials that provide optimum handling and transportation. However, in locating the storage area, consideration shall be given to the hazards associated with the flammability, and toxicity of the chemical or waste and relevant codes and standards;

c. The storage area shall be located in such a way as to protect containment structures and containers from physical damage that may result from moving vehicles;

d. Drums and non-stationary containers shall be clearly identified as to their contents, well-sealed, and constructed of materials that are resistant to corrosive attack from the contents;

e. The method of container storage shall be determined to ensure the stability of the stored products. If containers are to be stacked, they shall be stacked on stable platforms or pallets;

f. Groups of containers shall be arranged such that the contents are compatible and do not increase the potential for violent chemical reactions or explosive hazards;

g. Storage areas containing materials that could react with water to generate heat, cause fire, explosion, or other adverse reactions shall be provided with an enclosure such as a warehouse or storm shelter to protect the containers from exposure to the elements. The enclosure shall be designed to withstand storms and be anchored into the ground;

h. Outdoor storage areas shall be kept free of weeds and combustible materials;

i. Containers shall be closed at all times when not in use;

j. Containers stored outdoors shall be protected from damage due to weather by a shelter, drum lids, or other means;

k. Container storage areas shall be equipped with secondary containment to prevent stored materials from entering the natural environment or any storm, sanitary sewage, or water supply system;

l. Secondary containment areas may be emptied manually, by pumps, or by ejectors; however, all shall be manually activated and the condition of the accumulation shall be examined before starting to be sure no contaminants will be discharged into the environment. The examination shall include visual, odour, or analytical tests by RAKEZ registered agency, as applicable to the type of materials contained;

m. Accumulations from a secondary containment system shall be treated or decontaminated in accordance with the requirement of current appropriate federal laws and regulations;

n. Container and stockpile storage areas shall be protected from unauthorised access;

o. An inventory record shall be kept for all drums and containers stored within a storage area;

p. Containers, cabinets, drums, tanks, valves, and piping containing chemicals or wastes shall be visually inspected for leaks, structural integrity, and any sign of deterioration, e.g. corrosion, wearing of protective coatings) on a routine basis and critical or highly hazardous installations/areas shall require more frequent inspections by the employer internally and inspection records on the same shall be maintained at the employer premises. More detailed inspection for the integrity of containment systems, e.g. presence of cracks, condition of seals) shall be completed periodically;

q. Tanks and tank systems that contain corrosive materials or are subjected to conditions that may induce corrosion or deterioration of tank construction materials shall be internally inspected more frequently;

r. Ventilation systems, sump pumps, emergency alarms, impressed current corrosion protection systems, level alarms, and other mechanical systems shall be inspected on a routine basis to ensure proper functioning based on manufacturer recommendations, regulatory requirements, or best practices. Inspection records on such activity shall be maintained;

s. The employer's internal inspection shall include a review of the adequacy, amount, type, and accessibility of spill response equipment;

t. Routine leak detection and inventory reconciliation measures shall be implemented and results recorded for aboveground and underground tanks, consisting of manual dips (water and product), monitoring of interstitial spaces, an examination of monitoring wells, or other methods, based on the regulatory requirements;

u. During visual inspections, a checklist and log shall be maintained that details the following:

- A person responsible for the inspection;
- Storage areas and containers subject to the inspection;
- Condition of containers, cabinets, drums, tanks, valves, and piping;
- Quantity of chemicals and/or wastes in storage;
- Condition of leak detection and spills prevention systems, e.g. cathodic protection system, valves, overfills protection, secondary containment berms.

7.5.8 Storage with Compatibility

Chemicals shall be stored according to their compatibility with chemicals/materials. Incompatible chemicals shall not be stored in close proximity to each other. Separate the following groups of chemicals from each other:

a. Oxidizers;

b. Water Reactive;

c. Flammables;

d. Acids;

e. Caustics (Bases).

However, the final decision on chemicals compatibility storage shall be based on the requirements as specified in the relevant safety data sheet (SDS) of the chemicals and also as recommended by the manufacturer. Please refer to Appendix C. The employer shall ensure all containers are in good condition and properly labelled as per sub-section 7.6.2 of this regulation.

7.6. Hazard Communication

7.6.1 Safety Data Sheet (SDS)

SDS provides the information needed to allow the safe handling of particular substances hazardous to health in the workplace. It is the responsibility of the employer to obtain the appropriate SDS, display them, and ensure that all employees have ready access to SDS and have a clear understanding of safe handling requirements. Where a new substance is to be used in a place of work, the SDS shall be obtained in advance to allow an assessment of the controls required.

7.6.2 Labelling

Labels serve as a hazard awareness tool for people involved in the handling and transportation of chemicals and wastes, including truck drivers, loading dock employees, and security personnel.

a. Labels and hazardous safety marks shall provide critical information to handlers and transporters of chemicals and wastes. Reference shall be made by the employer to the appropriate competent authorities;

b. All containers of substances hazardous to health or handled in a place of work shall be labelled to allow the substances to be used safely. Containers into which a substance hazardous to health has been decanted shall also be clearly labelled to identify the contents;

c. Containers, cabinets, drums, tanks, valves, and piping shall be labelled with their contents and any appropriate hazard communication and regulatory labels. Labelling shall be placed in such a way that leads to quick identification of hazards for emergency responders in the event of an emergency, i.e. an accidental release of chemicals or wastes from a container or fire incident;

d. Labels shall be visible, legible, of an appropriate size and colour, and displayed against a background of contrasting colour. Labels shall be made of durable and weather-resistant material to withstand conditions that they will be exposed to without substantial deterioration or detachment of colour, symbols, letters, or numbers;

e. The selection of the container and the information on the label shall be designed to minimise the risk of inadvertently mixing incompatible substances;

f. Hazardous or liquid industrial wastes shall also be labelled with a date, which indicates the point at which the container was filled, sealed, and prepared for disposal;

g. Where a substance hazardous to health is contained in an enclosed system, such as piping or reactor vessel, it must be identified who may be exposed to the contents. Methods for identifying the contents of piping, conduits, and ducts can be done by the use of colours, letters, and symbols;

h. If a container does not have a label or has been improperly labelled, an action shall be taken to correctly label the container without delay. If the contents are unknown, the container shall be marked “Caution: Do not use – Unknown Substance” until the contents can be identified or suitably disposed of.

7.6.3 Competent Employees

a. Individuals responsible for chemicals and wastes management shall be adequately trained by a competent 3rd party, and they shall be fully aware of the hazards associated with it, prior to engaging them in the chemicals (including its waste) handling and storage activities;

b. Training shall be specific to the chemicals and/or wastes used/stored at a site and shall include:

- Potential hazards and health effects, including the interpretation and understanding of Safety Data Sheets (SDS), e.g. ingredients and properties of substances) and labelling;

- Procedures and special precautions for safe storage, use and handling, and loading and off-loading, including use of personal protective equipment;
- Emergency response procedures, including fire and spill containment/clean-up methods for specific types of contaminants;
- Procedures for dispensing product;
- Any terms and conditions of a certificate of approval, where one has been issued.

c. Individuals, who handle, offer for transport, or transport hazardous materials and chemicals that are considered "dangerous goods" shall be competent. Transport of dangerous goods training certificates validity shall not be more than three years and within which time refresher training shall be completed. Training shall be specific to the types of "dangerous goods" that the facility manages. Training topics shall include:

- Transport of dangerous goods training requirements and handling responsibilities;
- Descriptions of dangerous goods classes and compatibility/risk groups;
- Dangerous goods list data and other sources of information.
- Dangerous goods safety marks, placards, and requirements;
- Shipping document data and exceptions;
- Details of small and large means of containment
- Emergency actions, information, and requirements;
- Accidental release procedures and responsibilities.

d. Training of personnel shall be managed through formalised education and training program, which includes consideration of:

- Job-specific training and competency requirements, including the amount and type of introductory and continuing/refresher training required, required education and experience, specified certifications, e.g. trades certificate for a given position;
- Training program contents;
- Training program delivery methods, e.g. informal meetings, formal classroom training, and on-the-job training;
- Evaluation of training effectiveness (both training programs and knowledge of trained individuals);
- Recordkeeping.

e. Refresher training shall be completed on a routine basis, as a minimum, according to relevant regulations or other frequency, based on risk management decisions;

f. Only competent persons shall be allowed to use, handle and transport chemicals and wastes. Access to chemical and waste storage buildings and areas shall be limited to competent individuals;

g. Only trained individuals with valid certificates and employed by an approved 3rd party shall be permitted to install, repair, service, or remove storage systems and equipment that contain, or have

contained, flammable or combustible liquids or gases, e.g. fuel oil and gasoline products and gaseous fuels and other hazardous chemicals and wastes;

h. Records of training shall be maintained and may include the type and description of the training, the date the training was completed, the employees attending the training, and any expiry dates for specific training;

i. Training records shall be maintained for a minimum of two (2) years after the expiry of a training certificate or, if no certificate is issued, records shall be retained to demonstrate that employees have full and current training in accordance with identified training needs.

7.7. Radioactive Works

The person involved in working with radioactive material or radiation generators (X-ray) shall be competent and authorised by the federal authority for nuclear regulation (FANR). Ionising radiation spreads through space like light or heat. Distance is very useful for protection when handling physical sources. The dose rate from a source is inversely proportional to the square of the distance from the source. This “inverse square law” means, that if the distance from the source is doubled, the dose rate will be one-fourth. The dose rate at 0.1’’ from a source will be 10,000 times higher than 10’’ from the source. Ionising radiation imparts energy to living cells. In large enough doses, this energy can damage cellular structures, such as chromosomes and membranes. If not repaired, this damage can kill the cell or impair its ability to function normally. Whether this damage is harmful depends on many factors, including the type of cell, the absorbed dose, and the rate of absorption. The top management must set up a written radiation safety and protection program. This policy must be posted in a conspicuous place.

Federal Law by decree no. 6 of 2009 concerning the peaceful uses of nuclear energy and other relevant FANR regulations shall be complied with to address the topic of protection of the public, employees, and the environment.

FANR is the authority responsible for verifying the arrangement of radiography work since the safety arrangement usually depends on the work environment, the activity of the radiation sources, and the safety measures in place. FANR has specific guidelines for industrial radiography work which gives the required safety arrangement should be in place in the comprehensive arrangement.

7.7.1 Mandatory Procedures

a. For import/export of any radioactive sources, Licence from Federal Authority for Nuclear Regulation (FANR) website: www.fanr.gov.ae shall be obtained by filling and submitting the relevant forms /details;

b. For importing, exporting, storage, and handling of radioactive isotopes in RAKEZ jurisdictional areas, the current FANR regulations shall apply. For the import of radioactive isotopes, NOC for radiography (HSE-GU02.F02) shall be obtained from RAKEZ HS&E Department; for further information on employer NOC request, refer the Guidance to obtain HS&E NOC (HSE-GU02).

c. The employer shall submit proof of disposal/airway bill within 30 days for exporting radioactive isotopes or disposal of the spent source;

d. Radioactive/radiography NOC from RAKEZ HS&E department is required before carrying out radiography work involving radioactive materials;

7.7.2 Waste Disposal

a. Radioactive Waste disposal is not allowed in Ras Al Khaimah. The user of spent Radioactive Material must arrange with their supplier for the return of radioactive waste or decayed source to port or country of origin or approved disposal sites as per FANR requirements.

b. Where the expected annual dose from radioactive waste is less than 0.01 mSv to members of the public, the generator shall refer to the FANR REG-26 and RG-18 for disposal options. FANR is the only authority that can assess and approve the discharge activities as per the required assessment.

7.7.3 Requirements for a Radioactive Waste Storage Area

a. The radioactive waste storage area shall be a dedicated facility with centralised access but off the normal traffic paths;

b. When the waste to be stored is heavy, or heavy machinery is needed to move waste containers, the floor must be designed to accommodate the anticipated loading;

c. The basement floor is preferred for storing and will be the best location and this may also be a better place to store waste that emits a significant radiation field;

d. The floor and interior surfaces shall be covered with nonporous materials to facilitate decontamination if leakage or spillage occurs and to enable the storage area to be kept clean;

e. If liquids are to be stored, the need to provide recessed floors, diking, or drainage to holding tanks shall be considered;

f. The need to provide forced ventilation to prevent the build-up of solvent fumes or airborne radionuclides shall be considered;

g. The air shall be exhausted to a safe area outside the building through a single duct designed to enable the air concentration to be accurately monitored. The need to provide diagnostic air sampling systems to locate the origin of released airborne activity in the storage area shall also be considered;

h. The storage area shall be provided with protection from fire and flood. Lighting shall be adequate to enable waste containers to be identified, inspected, and safely handled;

i. The need for climate control shall be considered. For long-term storage, a dry even cool temperature is preferred to minimise the degradation of the waste. The storage area shall be organised to enable different waste categories to be segregated and accessible for placement, periodic inspection, monitoring, and routine and emergency retrieval;

j. The area might need to accommodate freezers for storing biological waste and shielding for containers emitting penetrating radiation. Shielding may be affected by surrounding containers by other containers or by using shielded storage bins or temporary concrete block walls. These shall be constructed with consideration of the need to periodically inspect the waste containers. The storage space shall be organised to enable handling equipment to be safely used.

7.7.4 Controlled Area

FANR defines a "controlled area" as "A defined area in which specific protective measures or safety provisions are or could be required for: a) controlling normal exposures; b) preventing the spread of contamination during normal working conditions, or c) preventing or limiting the extent of potential exposures.

a. Any work area where radiation exceeds 7.5 mSv/h. shall be designated as a controlled area. Management must ensure that only classified persons are allowed in a controlled area. Persons below 18 years old are not allowed in the controlled area;

b. The controlled area must have a standard radiation hazard symbol, a barricade, and blinker lights;

c. When radiation work is conducted in an operating area where other personnel could be exposed to ionising radiation, the employer shall establish a work permit system to prevent exposures to non-classified personnel.

7.7.5 Transportation of Radioactive Material

a. Radioactive Material shall be packed, marked, labelled, and transported as per FANR REG-13 and FANR REG-23 for radioactive sources under security category 1,2;

b. Before each package of radioactive material is offered for transportation, it shall not have a radiation level exceeding 2 mSv/h (200 mrem/h) at any point on the external surface of the package and 100 Sv/h (10 mrem/h) at 1 m distance from the external surface of the package. For exceptions to the above where the prescribed level is exceeded, the package of the radioactive material shall be transported exclusively with approval from the HS&E Department;

c. Permits for importation and re-exportation of radioactive material must be approved by the FANR. Radioactive Materials shall be transported as per FANR REG-13 and FANR REG-23 for radioactive sources under security categories 1,2.

7.7.6 Emergency Procedures

The organisation must implement emergency procedures in the following scenarios involving radioactive material:

a. If splashed with a radioactive solution;

b. If cut by glassware, injured by a hypodermic needle, splinters, etc.;

c. In the event of over-exposure to radiation, or the accidental release of radioactive material.

8. Electrical Safety

All electrical installations and fittings shall be in accordance with "The Electricity Wiring Regulation" of Etihad WE.

8.1. Workmanship & Material

a. Good workmanship and proper materials of internationally acceptable standards shall be used in all electrical installations;

b. All material/equipment shall be so constructed, installed, protected, and shall be capable of being maintained, inspected, and tested, to prevent danger so far as reasonably practicable;

c. All installations shall be suitable for the maximum power demanded by the current-using equipment when it is functioning in its intended manner.

8.2. Electrical Conductors

a. All conductors shall be of sufficient size and current carrying capacity for the purposes for which they are intended;

b. All conductors shall either (i) Be so insulated, and where necessary, further effectively protected, or (ii) Be so placed and safeguarded as to prevent danger so far as reasonably practicable;

c. Every electrical joint and connection shall be of proper construction as regards conductance, insulation, mechanical strength, and protection.

8.3. Overcurrent Protective Devices

a. Where necessary to prevent danger, every installation and every circuit thereof shall be protected against over current;

b. The above protection shall be affected by devices which:

- Will operate automatically at values of current which are suitably related to the safe current ratings of the circuit;
- Are of adequate current breaking/making capacity;
- Are suitably located and are constructed to prevent danger from overheating, arcing, or the scattering of hot particles when they come into operation and to permit ready restoration of the supply without danger.

8.4. Precautions Against Earth Leakage & Earth Fault Currents

a. Where metal works of electrical equipment, other than current-carrying conductors, may become charged with electricity in such a manner as to cause danger if the installation of a conductor shall become defective or if a fault shall occur in any equipment:

- The metalwork shall be earthed in such a way as will cause a discharge of electrical energy without danger;
- Other equally effective precautions shall be taken to prevent danger.

b. Every circuit shall be arranged to prevent the persistence of dangerous earth leakage currents by:

- The overcurrent protective devices mentioned in sub-section 8.3;
- A residual current device or equally effective device.

c. Where necessary to prevent danger, where metalwork of electrical equipment is earthed for compliance with sub-section 8.4. (a) above and is simultaneously accessible with exposed metal parts of other services, the latter parts shall be effectively connected to the main earthing terminal of the installation.

8.5. Position of Protective Devices, Switches & Electrical Equipment

a. No fuse or circuit breaker other than a linked circuit breaker shall be inserted in an earthed neutral conductor and any linked circuit breaker so inserted shall be arranged to break also all the related phase conductors;

b. Every single-pole switch shall be inserted in the phase conductor only and any switch connected in an earthed neutral conductor shall be a linked switch which shall also break the related phase conductors;

c. Effective means of isolation and switching, suitably placed for ready operation, shall be provided so that all voltage may be cut off from the installation, circuit, or equipment served by such devices, as may be necessary to prevent or remove the danger;

d. For every electric motor, an efficient means of disconnection shall be provided which shall be readily accessible, easily operated and so placed as to prevent danger;

e. Every piece of equipment which requires operation or attention by a person in normal use shall be so installed that adequate and safe means of access and working space are afforded for such operation or attention.

8.6. Precautions in Adverse Conditions

a. All equipment likely to be exposed to weather, corrosive atmosphere, or other adverse conditions, shall be so constructed or otherwise protected that danger arising from such exposure is prevented;

b. All equipment situated in surroundings susceptible to the risk of fire or explosion precautionary measures shall be taken, as may be necessary to prevent danger.

8.7. Nature of Supply

a. Following aspects of electrical power supply source shall be considered while designing electrical systems:

- Nominal voltage;
- Nature of current and frequency;
- Prospective short circuit current at the origin of the installation;
- Type and rating of overcurrent protective device acting at the origin of the installation;

- Suitability of the source to meet requirements of installation including the maximum demand;
- The earth loop impedance of that part of the system is external to the installation.

b. Where a supply for safety purposes or standby purposes is specified, such supplies shall have adequate capacity, reliability, and rating, and appropriate changeover time for the operation specified.

8.8. Installation Circuit Arrangements

a. Every installation shall be divided into circuits as necessary to avoid danger and minimise inconvenience in the event of a fault, and to facilitate safe operation, inspection, testing, and maintenance;

b. Separate circuits shall be provided for parts of the installation, which need to be controlled, in such a way that these circuits are not affected by the failure of other circuits;

c. The number of final circuits required and the number of points served by each circuit shall be such as to comply with the requirements for suitable over current protection, isolation, switching, and the current-carrying capacities of the conductors

d. The employer must display the circuit diagram near to the distribution panel.

8.9. Additions & Alterations to An Installation

No additions or alterations, temporary or permanent, shall be made to an existing installation unless it has been ascertained that the ratings and the condition of any existing equipment which shall have to carry an additional load are adequate for the altered circumstances and that the earthing arrangements are also adequate.

8.10. Filtration Device

Adequate filtering/smothering devices shall be introduced between the incoming main supply and such electrical devices like arc furnaces, etc., which are likely to transmit harmful harmonic radiations, voltage spikes, or such other disturbances, back to the transmission/distribution network.

8.11. P.F Correction

Capacitive devices like P.F. correction equipment shall have an arrangement for safe conducting the charges to the earth upon disconnection of the incoming power supply. Enclosures containing such devices shall have a caution notice displayed prominently on the front panel stating that the inner circuits could be alive even when the main incoming supply is switched off.

8.12. Inspection & Testing

On completion of an installation or an extension or alteration of an installation, appropriate tests and inspection shall be made to verify, so far as reasonably practicable, that the requirements of regulations 8.1 to 8.11 have been met.

8.13. Electrical Equipment/Installations

a. All machinery layout/electrical works installations and alterations in industrial premises shall be approved by TSS before operations. It remains the responsibility of the employer to ensure that all such installations are

safe with all relevant approvals/certifications from Etihad WE prior to TSS approvals. All electrical works shall be carried out by an Etihad WE's registered contractor/electrician;

b. Defective electric cables, apparatus, motors, fans, welding gears, etc. shall be rectified before work commences;

c. It is forbidden to replace burnt-out fuses with fuses that have a higher rating than the specified rating;

d. Electric inspection lamps are to be fitted with protective glass and a protective mesh. More powerful bulbs than those for which the inspection lamps are designed may not be used;

e. Electric inspection lamps, floodlights, etc. are to be hung up;

f. Electric heaters, motors, fans, transformers, welding apparatus, etc. shall not be covered, but are to be protected so that they are not subjected to moisture, water, oil, or steam;

g. During a break in the work and also when work is finished for the day, lighting, electric motors, inspection lamps, and welding apparatus are to be switched off;

h. Isolation and, where necessary, earthing at an appropriate place to be done before undertaking any repair/maintenance work on electrical installations;

i. The use of generators in the pre-built warehouse areas is not advised. The use of generators in other areas shall need to be approved on a case-to-case basis by TSS.

9. Machine Installation & Operation

Machinery is defined as any industrial fixture attached to a building or land. The employer shall be responsible for providing machinery that has been installed and operated in a safe manner by competent employees. Regular inspection, maintenance, and record-keeping shall be conducted and records maintained.

The term machinery includes any lifting appliance, mechanised hatch cover, or power-driven equipment. Machinery layout requires the approval from TSS Department. Machinery shall be installed inside the approved warehouse facility only with special consideration for some machinery based on their emission, noise, vibration, and any machines that are designed for outdoor installation. Unauthorised installations of any machinery/equipment by the employer shall be liable for serious action, as per the RAKEZ violation code.

a. Machinery layout plan and dimensions with a list of machines/equipment shall be submitted by the employer prior to installation. All machinery installation shall comply with applicable regulations and guidelines;

b. Full operational details and technical specifications with relevant drawings/brochure/catalogue, etc. shall be submitted to RAKEZ. Full technical details/specifications/drawings with test certificates for the installation of boiler, heating oven, furnace, pressure vessels, compressors, and lifting equipment, shall be submitted to RAKEZ for approval prior to installation;

c. Equipment shall be installed in a neat and workmanlike manner and shall be firmly secured to the surface on which it is installed;

d. All electrical installations shall be approved by TSS Department prior to installation/operations. It shall remain the responsibility of the employer/consultant/main contractor (whoever/wherever is applicable) to obtain relevant approvals from Etihad WE for such installations as applicable;

e. All electrically operated machines/equipment shall be fitted with ELCBs and properly earthed/grounded as per Etihad WE regulations. Electrical outlets near sources of water shall be properly grounded;

f. All service lines and power cables, etc. either to be put in covered trenches or routed through elevated cable trays/pipe rack and shall not be laid down directly on the floor;

g. Minimum 1 m horizontal clearance from the walls/structure to the machine/equipment and minimum 2 m in-between each machine/equipment shall be maintained;

h. Equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment;

i. All equipment such as, but not limited to the forklift, crane, press, sander, grinder, drilling machine, saw, lathe machine, CNC machine is required to be provided with "dead man's switched or dead man's control" so that, in the event where the operator becomes incapacitated, the device will respond in a way that particular equipment will stop safely and reduce the chances of harm to other person and result to at least minimum damage to properties;

j. Effective measures shall be provided for prompt/emergency shut off the power to any machinery in respect of which this is necessary, in an emergency;

k. All moving/rotating/dangerous parts of the machine/equipment shall be fully covered and fitted with proper safety guards as per the manufacturer's instructions. All dangerous parts of machinery shall be effectively guarded unless they are in such a position or of such a construction as to be as safe as they would be if effectively guarded;

l. Parts of electric equipment that in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material;

m. There shall be no damaged parts that may adversely affect safe operation or mechanical strength of the equipment, such as parts that are broken, bent, cut, or deteriorated by corrosion, chemical action, or overheating;

n. Internal parts of electrical equipment, including bus bars, wiring terminals, insulators, and other surfaces, may not be damaged or contaminated by foreign materials such as paint, plaster, cleaners, abrasives, or corrosive residues;

o. Outdoor electric equipment shall be installed in suitable enclosures and shall be protected from accidental contact by unauthorised personnel, or by vehicular traffic, or by accidental spillage or leakage from piping systems;

p. All higher/elevated working platforms/areas shall also fully be covered/barricaded with suitable and rigid guardrails/handrails;

q. All conveyor belts shall be fully covered/enclosed to prevent dust generation/emission;

r. Wherever applicable, full technical details/specifications/drawings for the dust collection, extraction/filtrations system, and wastewater treatment plant shall obtain EPDA and PSD's approval prior to installation;

s. When any cleaning, maintenance, or repair work that would expose any person to danger has to be undertaken on machinery, the machinery shall be stopped and the power supply shall be switched off before the work is begun and adequate measures shall be taken to ensure that the machinery cannot be restarted (Lockout/Tagout) until the work has been completed. "Lockout/Tagout (LOTO)" refers to specific practices and procedures to safeguard employees from the unexpected energization or start-up of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires that a designated individual switches off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorised employee(s) either lock or tag the energy-isolating device(s) to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively;

t. Operational safety as recommended by the manufacturer shall be always followed.

10. Work Equipment

The employer shall be responsible for providing safe work equipment to be used by employees. The employer shall provide his employees with adequate personal protective equipment and ensure they have the necessary competency to operate them. Regular inspection, maintenance, and record-keeping shall be conducted, and records maintained.

10.1. Selection

The selection of work equipment shall be made based on:

a. Suitable for the operations/activities decided to perform;

b. Suitable to the environment in which they are used;

c. Employee's competency to operate them safely and without danger to health.

10.2. Pre-Operation Checking

Work equipment shall be inspected prior to use to ensure that:

a. Handles on hammers, sledgehammers, hand tools, etc. are to be firmly in position before use;

b. For tools with jaws, jaws are not sprung to the point of slippage;

c. For impact tools, they are free of mushroom heads;

d. For tools with wooden handles, the handles are free of splinters or cracks and are tight in the tool;

e. For tools with guards, removable guards are in place on the machine or equipment before use, and guards prevent any part of any employee's body and clothing from contacting dangerous moving parts. Also, guards shall prevent any object from falling into moving parts;

f. The repair or replacement parts are examined for possible defects;

g. If a tool or its guard is defective, damaged, or in any way does not meet the requirements of these procedures, employees shall not use the tool and shall immediately notify their supervisor;

h. The tool is otherwise safe for use.

Portable electrical equipment shall be inspected prior to use to ensure that:

a. Electrical hand tools are connected only to appropriate safe-voltage outlets;

b. 110 voltage power shall be given to such hand tools for its intended operations whenever possible. For the case where a 220-voltage power hand tool is being used in the operation, its wirings shall be covered with appropriate double insulating materials;

c. Power Tools shall be maintained in an efficient and working condition and also in good repair;

d. All portable circular saws fitted with a blade having a diameter larger than 5 cm. shall be equipped with suitable guards above and below the base plate or shoe.

10.3. Operational Safety

a. Employees shall always use the proper tool for the job;

b. Employees may not remove a guard for any reason while operating equipment or tools;

c. Electric cables and cords shall be kept clean and free from kinks;

d. Tools shall not be carried by their cord;

e. All necessary personal protective equipment (PPE) is worn while using tools;

f. If an employee is distracted or unable to focus on the work involving tool use, they shall stop work with that tool;

g. Upon finishing with a tool, basic maintenance shall be performed, e.g. the tool shall be kept sharp, oiled, and stored properly, as appropriate;

h. Defective tools shall be immediately reported to the supervisor so they can be repaired or replaced.

10.4. Maintenance

Work equipment maintenance is any process used to keep work equipment in reliable working order. It may include routine maintenance as well as corrective repair work.

PPM is a scheduled maintenance plan, set out to ensure work equipment is maintained at regular intervals. This helps to minimise partial or complete failure, and thus minimise incidents and business interruption. Inspections detailed above are part of a PPM plan. The employer should ensure that a PPM plan is available for work equipment used by their employees and where required contractors.

10.5. PPE and Work Area Checks

a. Employees shall locate and put on necessary and appropriate personal protective equipment (PPE) before using or operating tools;

b. Employees shall change clothing or take off jewellery that could become entangled in the tools they are to use;

c. Employees shall make sure that work areas are well lit, dry, and clean before beginning work.

10.6. Welding Operation

10.6.1 Electric Welding

a. A work permit shall be issued by the employer while carrying out any such works;

b. A welding helmet/welding visor in good condition is to be used. Ultraviolet radiation from the electric arc can cause “welders” blindness and eye inflammation;

c. Gauntlet gloves of suitable type in good condition are to be used;

d. Radiation from electric welding can cause skin injuries and for this reason, the body shall be properly covered. The use of overalls and aprons is recommended;

e. Ear protectors shall be used by electric welders and gas torch operators while working in the overhead position or other positions when welding beads can fall into the ear and cause severe injuries;

f. Protective goggles shall be used when knocking up slag, etc.;

g. Live electrodes or electrode holders shall always be placed in the correct holder when not in use;

h. Any welding arc is to be screened as much as possible to avoid other people being affected or exposed by the welding glare;

i. Welding equipment is to be checked for the correct voltage, and the feed, earth, and welding cables, and electrode holders are to be free from defects. Defective cables and electrode holders are to be replaced;

j. Welding equipment is to be switched off when not in use;

k. The current is to be switched off when the welding cable is being pulled from one place to another;

l. Welding cable shall not be laid on gas cylinders, oil containers, or through wet areas, etc.;

m. It is forbidden to lay welding cables over hot steam boilers, steam pipes, etc.;

n. Welding cables are to be cleaned and coiled when welding work is finished;

o. Welding activity shall be carried out in the fabrication shed. Proper ventilation and welding fumes extraction system for confined places and factory buildings shall be provided as per the EPDA requirements;

p. When X-ray control is being carried out, this work is to be done by an expert and nobody is to stand behind the weld being examined or within a distance of at least 10 m from the X-ray tube;

q. Precautions are to be taken to prevent adjacent objects from catching fire due to welding operations.

10.6.2 Compressed Gas Welding and Gas Installation

a. Gas installation including storage and handling of compressed gases shall be in accordance with the UAE Fire and life safety code of Practice;

b. All gas cylinders shall be treated carefully. Protective covers are to be fitted during storage and transport;

c. Gas cylinders shall not be subjected to impact and shall not be placed in intense sunshine or close to any object radiating heat or fire;

d. Gas cylinders are to be stored in a shaded area, away from heat and ignition sources, placed upright, and accessible from at least two sides;

e. Oxygen and other gas cylinders shall not be kept together, considerable distances of about 6 m are to be maintained if possible;

f. Defective gas cylinders are to be marked “defective” and shall be returned to the supplier as soon as possible;

g. Oxygen cylinders and oxygen equipment shall not be placed in oily locations and handled with oily hands or gloves;

h. Valves on all gas cylinders shall always be closed during a pause in work, or on work completion. Valve covers are to be fitted when cylinders are not in use;

i. Acetylene gas hoses are to be red; oxygen hoses are to be blue;

j. Hoses and other equipment shall not be hung on gas cylinders, values, or other fixtures;

k. Gas hoses shall not be laid over hot steam boilers or steam pipes, etc.;

l. Defective gas hoses shall not be used. The only permissible way to join hoses is to use junction nipples;

m. Gas cylinders are to be fitted with flame arresters and flash backfire valves;

n. It is not permissible to use defective or damaged gauges on gas cylinders;

o. No welding/cutting work is to be carried out on/near oil/gas/chemical installations, pipelines, tanks, drums, etc. Defective sections shall be dismantled and taken to a safe place for repair;

p. It is prohibited to manufacture acetylene gas by means of calcium carbide in a gas cylinder;

q. Fire extinguishing equipment shall always be available during welding/cutting work;

r. Flammable/combustible materials shall be kept at a safe distance from a welding/cutting hot work area;

s. Transporting vehicles of gas cylinder/bulk gas shall have approval from the MOI or relevant authorities;

t. The design, construction, and installation of bulk gas storage tanks shall meet relevant international standards such as NFPA, API, ASME, or any other relevant current standards, and prior approval from RAK Civil Defence shall be obtained;

u. Adequate work permit procedure (hot work and cold work permit) shall be implemented by the employer management before the commencement of any hot and cold works;

v. Welding activity shall be carried out in the fabrication shed. All welding areas shall be provided with suitable extraction/filtration systems to dissipate welding fumes;

w. All gas pipes/hoses are using inside the confined space shall be inspected at the beginning of each shift. The defective hose shall be removed from service also periodically leak tested and tagged to ensure the safe condition to prevent oxygen enrichment and explosion;

x. The use of pipes/hoses for conveying oxygen or flammable gases into a confined space shall be controlled to minimise the risks;

y. All gas supply valves for pipes/hoses shall be securely closed before the pipes and hoses are withdrawn from the confined space to a place that is well ventilated;

z. All gas hoses cannot be removed inside the confined space, they shall be disconnected from the gas supply at a point outside the confined space and their contents safely vented.

10.7. Paint/Blast Booths/Rooms

Spray painting operations/activities in the open area are not permitted. All spray-painting operations shall be carried out in the fully covered and properly designed/constructed/approved painting booth/building. The construction material and storage racking/shelving in such areas shall be of fireproof material and acceptable and approved by TSS Department and RAK Civil Defence as per the UAE fire & life safety code. The walls and flooring shall be of smooth finish to prevent the pocketing of paint residue and be easily cleanable.

a. Paint/blast booth/building fitted with proper extraction/filtrations system design calculation of the same shall be based on UAE Fire and Life Code of Practice;

b. All electrical machines/equipment/lighting/fixtures, etc. in the painting booth/building shall be of flameproof/ignition proof type;

c. An outlet from the extraction/filtration system shall be taken out from the building, raised to a minimum of 3 m from the roof ridge level, and provided with a sampling point with safe ladder/access;

d. Proper paint storage room for storing paints, thinner, and solvent, etc. shall be provided. Storage of Paint material more than quantity in-use for painting operations (maximum 20 litres) shall be stored outside the painting booth in a proper fireproof steel cabinet or paint storage room designed/constructed with fire resistance material, spillage collection, ventilation, lighting, and fire detection/protection arrangement;

e. Firefighting equipment shall be installed as per RAK Civil Defence requirements;

f. All electrical equipment/lighting/fixtures, etc. in the paint storeroom shall be of intrinsically safe/ignition proof type;

g. Exhaust ventilation system @ 10-12 air changes/hr. shall be provided for the paint store room;

h. Proper spillage/drainage collection provision shall be provided;

i. The paint/blast booth/building shall be fitted with an emergency stop switch in the inside area and when operated in case of emergency shall trigger an audio-visual alarm;

j. Adequate warning signs shall be posted at all spraying areas and paints storage rooms;

k. All PPE related to painting shall be provided;

l. All wastes from such operations shall be treated/recycled/reused as far as possible and any requirement for disposal shall be Federal Law No. 24 of 1999 and subsequent executive orders.

10.8. Air Receiver Tank & Its Accessories

10.8.1 General Requirements

a. Air hoses shall be kept free from any lubricant to prevent the possibility of deterioration;

b. Air hoses shall not be laid down across the floors or aisles to avoid the trip or fall of personnel. And, whenever necessary, air supply hoses shall be elevated or otherwise positioned properly in the workplace to provide adequate access and protection against damage;

c. The Air hose shall not be bent or twisted;

d. Hoses shall be inspected frequently for defects, and any defective equipment repaired or replaced immediately;

e. Restraining devices such as keepers, chains, slings, proprietary special couplings, and whip-checks shall be installed on all pipe-diameters connected with high-pressure compressed air hoses to prevent them thrashing/whipping about in the event of a hose or coupling failure;

f. RAKEZ enlisted 3rd Party inspection and certificate is required and shall be conducted annually (see Table 10-A). In addition to this, the employer has to appoint a competent person to carry out regular inspections and preventive maintenance of all parts of compressed air powered equipment including hoses, couplings, clamps, and keepers to retain the operational integrity of this equipment and corrective action shall be taken subsequently where necessary;

g. Only competent personnel shall be allowed to carry out an operation, maintenance, and repair of this air receiver tank and its accessories. Upon Carrying out repair work on the tank, approved 3rd Party inspection and shall be conducted and a necessary Test certificate for the tank and its system shall be obtained before resuming its operations;

h. Face shields, goggles, or other eye protection shall be worn always whenever necessary by personnel performing cleaning operations on the air receiver;

i. Air compressors shall be grounded or bonded while being used when fuel, flammable vapours, or explosive atmospheres are present;

j. An effective safety guard shall be installed on all moving parts, such as compressor flywheels, pulleys, and/or belts, etc.;

k. Only tanks with "hydrostatic test and appropriate certificate" from a 3rd party certifying body registered with ENAS are allowed to be used on the premises. The maximum allowable working pressures of air receivers shall never be exceeded except when being tested and approved by RAKEZ enlisted 3rd Party;

l. Receivers shall be drained frequently to prevent the accumulation of liquid inside the unit and the liquid waste shall be drained only to a proper industrial drainage system;

m. A safety (spring-loaded) relief valve shall be installed to prevent the receiver from exceeding the maximum allowable working pressure.

10.8.2 Pressure Devices

a. Maintain valves, gauges, and other regulating devices in good working condition;

b. Air tank safety valves shall never be higher than the maximum allowable working pressure of the air receiver;

c. Case iron seats or disk safety valves shall be ASME approved and stamped for intended service application;

d. Frozen safety valves shall be defrosted and drained before operating the compressor.

10.8.3 Compressed Air Equipment Maintenance

a. The compressor shall not be lubricated with high flash point oil or grease;

b. The air compressor shall be frequently cleaned to maintain its workable condition;

c. The air systems shall be fully purged every after cleaning;

d. Lockout and Tagout shall be applied during the maintenance work of the compressor.

10.8.4 Boilers & Pressure Vessel

a. Installation and operation of boilers, oil heaters, etc. shall be designed in compliance with ASME boiler and pressure vessel codes, and it shall be approved by HS&E, TSS, and RAK Civil Defence, and other concerned authorities;

b. Boilers shall be installed at a safe distance from production or other working areas and to be protected (at least 3 m). Entry is to be restricted in the boiler rooms for authorised personnel only;

c. All safety devices of the boiler shall be checked before starting and the safety devices, as well as pressure gauges and water level meter, shall be located at a height of not more than 1.5 m from the ground level;

d. A suitable stop valve/valves by which the boiler vessel or the boiler system may be isolated from other vessels or source of supply of pressure to be provided;

e. The boiler shall be checked and certified by an accredited 3rd party (in case of a new boiler, a manufacturer's certificate is acceptable) every year. The test and certification shall cover all the boiler's safety devices, gauges, internal and external conditions, etc.:

- External inspection: A visual examination/evaluation of the exterior surface, structure, foundations, and insulation of a pressure vessel or tank to determine the apparent condition and to establish the suitability of the vessel or tank for continued operation;
- Internal inspection: An examination/evaluation of the interior surface and structure of a vessel or tank using visual and/or non-destructive examination procedures to determine the physical conditions and to establish the suitability of the vessel or tank for continued operation;
- On-stream inspection: An examination/evaluation performed from outside of a pressure vessel or tank using non-destructive examination procedures to determine the apparent condition and to establish the suitability of the vessel or tank for continued operation;
- All the inspection/testing records and reports shall be maintained and will be required to be presented as and when required by RAKEZ.

f. Conditions mentioned in Article (16) of the Ministerial Decision 32 of 1982 on the prevention of preventive methods and measures for the protection of labour from the risk of work to be fulfilled and acknowledged;

g. Details of steam boiler/heater: capacity, fuel type, fuel rate, sulphur content, etc. to be provided;

h. Boiler room height and any adjacent building height to be provided. Boiler chimney height calculation shall be as per EPDA requirements;

i. The fuel tank shall be bunded with an impervious bund wall including the bund floor. The same shall be designed to confine fuel of 110% fuel tank capacity and underground bunded area to be lined with HDPE lining. Details of bund wall volume calculation and design shall be provided;

j. A proper drainage facility shall be provided for the boiler condensate and blowdown away from the domestic drainage of the facility. A detailed drawing in this regard shall be provided.

Table 10-A: Boilers and Pressure Vessels Frequencies for Testing/Inspection and Certification

S. N	Equipment	Functionality test	Integrity test
1	Boilers and pressure vessels	Every 12 months internal and external	Every ten (10) years

2	Air receivers	Every 12 months of the internal and external examination	Every ten (10) years

** Note: Refer to ENAS technical ETR-06*

10.9. Diesel Generator

The use of a diesel generator is not permitted at the employer facility unit. However, for a land facility where Etihad WE power supply is not available, approval can be considered. Diesel generator installation with diesel oil storage tank shall be approved by HS&E and TSS Departments.

The employer shall submit their request with drawings showing the location, capacity, fuel tank details, electrical installation, cable routing, the period of installation, and use/purpose of the generator as per the following requirements.

a. The installation of the generator shall be carried out by a qualified engineer;

b. The generator set shall be enclosed housing for suppression of noise and exposure of rotating/electrical parts;

c. Fuel type - Only less than 0.005% of sulphur content fuels are permitted;

d. Generators shall be placed (not in setback area 5.5 m from the fence line) with a minimum clearance of 1.2 m. all around and fixed on the stable ground ensuring the same does not move/tilt during the operations;

e. There shall be accessed only by authorised personnel and relevant signs to be placed;

f. Proper exhaust vents shall be provided to prevent the accumulation of smoke/gases/CO at ground levels. Noise levels and personal protection shall comply with health and safety rules and regulations;

g. Fuel/diesel tank/drums (if any) shall be placed in a secured/impervious area at a minimum distance of 1.2 m from the generators. The diesel tank and or diesel storage drums shall be suitably bunded/protected in case of spills, to avoid spills during storage/filling operations;

h. Prior to generator operations, check all safety/manufacturer precautions and for spills on/around the generator which could lead to ignition. Before refuelling the generators, turn them off and let them cool down. Gasoline spilled on hot engine parts could ignite;

i. Nearby the generators/fuel tanks/drums, fuel-burning appliances are not permitted to store or carry out any hot-work in the immediate surroundings;

j. The total electrical load shall not exceed the generator manufacturer rating;

k. For electrical cable routing, all service lines and power cables, etc. either to be put in the covered trenches or routed through elevated cable trays/pipe rack and shall not be laid down directly on the floor and all electrical installations shall be fitted with ELCB's and properly earth as per "the electricity wiring regulation" of Etihad WE;

l. Keep cords out of the way so they don't present a tripping/safety hazard. Provide necessary warning signs;

m. Proper fire protection arrangements in accordance with the UAE fire & life safety code of practice, shall be provided;

n. Proper signboard shall be displayed at the DG area i.e. danger high voltage, authorised personnel entry only, no smoking, use ear protection, etc.

11. Procedure for Safe Lifting Operation

The purpose of this section is to provide guidance for the employer engaging in activities that involve lifting operations at warehouses, manufacturing floors, construction sites, to and from vehicles, repair yards, workshops, etc. The management of lifting activities has been identified as a high-risk operation, which requires a uniform set of requirements for proper planning and execution to avoid unplanned and unsafe lifting operations which can result in catastrophic outcomes involving multiple fatalities and serious injuries as well as extensive damage to properties and facilities. This section highlights the important factors that have to be considered while proposing a systematic approach towards planning a lift. This also outlines the roles and responsibilities of the personnel involved in a lifting operation.

This section shall apply to all lifting equipment and accessories used at sites within RAKEZ jurisdictional areas. It is the responsibility of the employer, contractors, and any other users working within RAKEZ jurisdictional areas to ensure that all requirements stipulated in this protocol are fully complied with during any Lifting operations and NOC for lifting equipment (HSE-GU02.F03) shall be obtained from RAKEZ HS&E Department; For further information on employer NOC request, refer to Guidance to obtain HS&E NOC (HSE-GU02).

The below are excluded from this section:

a. Requirements for rope access: This information can be found in IRATA regulations for industrial rope access systems: specification, selection, use, and maintenance;

b. Requirements for escape lines.

11.1. Key Terminologies

Term	Description
Load	Any material, person, animals (or any combination of these) that are lifted by the lifting equipment. In some circumstances, the weight of the lifting accessories including the hook block may be considered as part of the load being lifted.
Lifting equipment	Any lifting machine, driven by manual or mechanical power, or other means that are able to raise, lower or suspend loads, and includes any accessories used in connection with that machine, but excludes continuous mechanical handling devices (i.e. conveyors), such as but not limited to: a. Cranes (tower, mobile, etc.), b. Wall/pillar cranes, derricks, swing jibs, and davits, c. Runway beams, monorails, all pad eyes, gin poles, and gin wheels, d. Winches, hoists (air and electric), crabs, telfer hoists, e. Chain blocks, wire rope pulling machines, pull lifts, trolleys, f. Powered working platforms,

	g. Elevators and lifts, h. Forklifts, self-loader, and side booms, i. Lifting jacks (pneumatic or hydraulic)
Lifting accessories or loose gear	Any item used to attach the load to the lifting equipment which is not in itself a part of the load or the equipment, such as: a. Chains and wire ropes, b. Chain, wire rope and webbing slings, c. Rings, links, hooks, shackles, eye bolts, swivels, blocks, snatch blocks, d. Beam clamps and plate clamps, e. Lifting beams/spreader beams
Competent person	The competent person carrying out a thorough examination shall be deemed competent by virtue of attaining the appropriate theoretical and practical knowledge, together with experience that will enable them to detect defects or weaknesses in the equipment. This will be a combination of experience; training and qualifications. The competent person shall be "independent and impartial". This does not prevent someone working for the same organisation from being a competent person but they shall not be responsible for production/operation/profit. The competent person shall have a minimum of 3 years of hands-on experience within a relevant engineering discipline related to lifting equipment and appropriate knowledge of the relevant laws, local and admin orders, codes of practice, and inspection techniques.
Trained person	All persons to be engaged in lifting operations shall be sent for training through 3rd party on safe lifting, rigging, and slinging methods. Regular safety inductions, safety talks, or training shall be carried out to all employees involved, including but not limited to, hazards and risks associated with the operations.
Substantial/major alteration	A measure whereby the equipment undergoes a change to either the quantum of its load lifting capacity or changes to its function or methods of controlling those functions. The following shall be considered "substantial/major alterations" or any other measure not specifically detailed that affects the safe use of the equipment: a. Increase in the safe working load or an increase in performance, b. Increase of the rated speeds, c. Increase of the reach (outreach, lifting height, etc.), d. Alteration to safety devices, e. Alteration to load-carrying parts, e.g. anchorages, spelter sockets, primary structures, etc. f. Alteration to driving mechanisms and controls, g. Repair or alteration that affects the strength and/or stability, h. Alteration of kind of current or voltage, i. Alteration of kind of guiding rails, j. Alteration of kind of the number of landing doors.
Inspection	Any physical activity, related to ensuring that an item of "lifting equipment", in its entirety and at a given location or environment, meets the specified design and operating standards and is safe to operate or utilise for a specified period. This includes, but is not limited to, activities such as measuring, testing, and recording, checking, analysing, loading, and charting one or more characteristics of the equipment.
Periodic inspection	The minimum, specified period, denoted in days, weeks, months, or years, between one "inspection" and a repeat or next "inspection" as per Table 11-A. This means an inspection based on the working environment, the frequency and severity of use of the lifting equipment, and in no circumstances shall the inspection interval exceed 12 months. The inspections shall include all items specified by the manufacturer for annual inspection together with all routine inspection items. If the manufacturer's recommendations are not available a competent person shall specify, in writing, all the items/components to be inspected together with the acceptance/rejection criteria, which shall be applied by the Inspector.

	***Note 1**: The 12-month inspection period is based on a normal working day of up to 8-hr and a 5/6-day working week (2400 hours). When the usage of the lifting equipment exceeds these figures, a competent person shall specify exactly, in writing, what the period of these inspections is.* ***Note 2:** As a result of a periodic inspection, a competent person may recommend a major inspection.*
Thorough inspection	It means the following items shall be checked for compliance with manufacturers' specifications and safe operation, as a minimum: a. Oil levels, fuel level, and lubrication. b. Ropes, rope terminal fittings and anchorages, rope drums, and sheaves for any damage and wear. c. All water is drained from air reservoirs. d. Crane for any loose or damaged structural component including supports and outriggers where fitted. Loose joints may be readily noticed by flaking or marking on the paint surface or by rust marks. Similarly, cracks may often be detected by rust runs. e. Security of the counterweight. Where this is in the form of removable weights, checking that the weights correspond to those shown on the counterweight chart for the operating condition in use. f. Load moment system where fitted is correctly set or fitted (or both) with the program appropriate to the boom or jib length, and fly-jib lengths and falls or parts of the rope. g. An indicator appropriate to the boom, jib, or fly-jib length is fitted. h. Crane cabin is in a tidy condition and free from grease and oil, rags, tools, and materials other than those for which storage provision is made. i. Pneumatic systems and hydraulic systems including their safety devices. j. Operation of the crane through all motions with particular attention to brakes. k. Operation of all limit switches or cut-outs and safety devices. Caution to be exercised in making the checks in the event of non-operation.
Working load limit (WLL)	This means the maximum load (mass), which any piece of lifting equipment may lift safely in the most efficient configuration. For wire rope, chain, and fibre rope slings this is in direct lift i.e. eye to eye in a straight vertical line.
Safe working limit (SWL)	This means the maximum load (mass), which any piece of lifting equipment may lift safely in a particular configuration, other than its most efficient configuration. e.g. for a wire rope sling choked on a square load without any corner protection its safe working load is approximately 50% of its WLL.
Proof load test	The application of a predetermined load excess of SWL to assess the ability of the equipment to withstand operation requirements. This applied proof load shall never exceed the elastic limit of the item being tested. The amount of Proof Load to be applied will vary depending upon the type of equipment, its SWL, and the applicable standard. On completion of any proof load test, the "lifting equipment" is to be fully inspected to ensure that the structural integrity of the equipment has not been impaired.
Testing and certification	All lifting equipment, Accessories, and supporting structures shall be overload tested before first use, major alteration, and periodically (As per Table 11-A). In some circumstances, it might be necessary to treat the supporting structures as separate, e.g. where a structure supports more than one crane. When the testing and subsequent thorough examination have been completed, the competent person shall issue a report of thorough examination which shall include details of the tests. Test certificate shall be issued, if the equipment is safe for use and no significant issues are found during the inspection. Testing and certification of lifting equipment and accessories shall be obtained through a 3rd party Inspection body approved by RAKEZ.

11.2. General Requirements for Lifting Operation

Lifting equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided, and to have regard to the working conditions and risks to health and safety in the place in which that work equipment is to be used. The risk assessment shall be carried out as per the requirements of Ministerial Order no. (32) of 1982 regarding "The Determination of Retentive Methods and Measures for The Protection of Employees from The Risks Work" and the RAKEZ regulations. The risk assessment will need to include:

a. How often the lifting equipment will be used;

b. Where the lifting equipment will be used;

c. The nature and characteristics of the load that the lifting equipment will lift;

d. Any limitations on use specified by the manufacturer or supplier;

e. It shall cover means of access, ergonomic risks, weather conditions in open-air operations, etc.;

f. Every lifting operation involving lifting equipment shall be:

- Adequately planned as per the Lifting Plan and this is to be conducted by a competent person;
- Adequately supervised;
- Conducted in a safe manner.

g. All lifting operations are 'risk assessed' safe working load - SWL's – shall not be exceeded;

h. The status of all equipment is to be known by all people using it and all who may be affected by it. The status is to be clearly identified;

i. All checks are to be conducted only by a competent person;

j. Only competent trained people are allowed in areas where lifting equipment is used;

k. The equipment in use is only to be made of a material suitable for the conditions under which it is to be used;

l. All fixing points and mountings are to be of adequate strength and capability;

m. Environmental aspects need to be taken into consideration e.g. when out of doors, high winds, ground conditions;

n. Equipment that has been stored needs checking prior to use.

11.3. Lifting Equipment on Hire

The crane hire employer has a duty to ensure that when a mobile crane is hired out, physical evidence is attached, e.g. a copy of the last examination report issued by the approved agency, and the user shall ensure that this evidence is available. The user shall ensure that the crane is thoroughly examined by a competent person before it is put into use, to make sure it is safe to operate.

The user shall manage the subsequent lifting operations safely. The user (as an employer or a self-employed person) also has the duty to ensure that periodic thorough examinations are undertaken at the frequencies laid

down in this protocol. The user may well come to an arrangement with the hirer under which the hirer carries out the thorough examinations, but that does not alter the user's duty to make sure they are done.

It is the responsibility of the employer to ensure that the mobile crane hired (temporary or contract) from 3rd party service providers, for operations within their facility, has the necessary access NOC issued from RAKEZ.

This is also applicable for a crane for hire for contract lifting operations where an organisation enters into a contract with a 3rd party who will undertake the lifting operation on their behalf, i.e. the 3rd party provides the crane and the operator. In these circumstances, the crane owner shall ensure that the crane is properly maintained, examined, and has a valid test certificate and safe to use and that the lifting operation is carried out safely.

11.4. Strength & Stability

a. Lifting equipment is of adequate strength and stability for each load, having regard in particular to the stress-induced at its mounting or fixing point;

b. Every part of a load and anything attached to it and used in lifting it is of adequate strength;

c. An account shall be taken of the combination of forces to which the lifting equipment will be subjected as well as the weight of any associated accessories used in the lifting operation. A competent person shall ensure that the strength and stability of the lifting equipment continue to be adequate for the tasks that the equipment is intended to be used for;

d. Where appropriate suitable effective measures to provide sufficient resistance to overturning shall be taken to ensure the adequate stability of the lifting equipment. Where there is a significant risk of overturning and/or overloading arising from the use of the equipment it shall be provided where appropriate with equipment or devices such as rated capacity indicators and rated capacity limiters. Such devices provide audible and/or visual warnings when the safe lifting limits are being approached.

11.5. Positioning & Installation

Lifting equipment shall be positioned or installed in such a way as to reduce to as low as is reasonably practicable the risk of the lifting equipment or a load striking a person; or from a load drifting, falling freely, or being released unintentionally. It shall be ensured that there are suitable devices to prevent a person from falling down a shaft or hoist way.

11.6. Lifting Accessories' Requirements

The main requirements relating to lifting accessories are as follows:

a. They are of good construction, sound material, and adequate strength, and free from patent defects;

b. The safe working load (SWL) shall be displayed or, for lifting accessories, plainly marked on it; only items listed or marked may be used in a lifting operation;

c. The safe working load shall never be exceeded;

d. Before being taken into service all items shall be tested and thoroughly examined by a competent person, and at six-monthly intervals during service;

e. Certificates shall be issued for all items;

f. Wrought iron equipment shall be periodically annealed (i.e. subjected to heat treatment which enables the wrought iron to revert to its "safer" crystal structure);

g. Registers shall be kept giving details of equipment.

11.7. Lifting Equipment for Lifting Persons

Lifting equipment for lifting persons used is designed:

a. To prevent a person using it from being crushed, trapped, or struck, or falling from the carrier;

b. To prevent so far as is reasonably practicable a person using it, while carrying out activities from the carrier, being crushed, trapped, or struck or falling from the carrier;

c. With suitable devices to prevent the risk of a carrier falling;

d. So that a person trapped in any carrier is not thereby exposed to danger and can be freed.

The raising and lowering of people by work equipment, which is not specifically designed for the purposes, shall only be undertaken in exceptional circumstances when it is not practicable to gain access by less hazardous means. Where it is necessary to use such work equipment then all necessary precautions shall be taken to ensure safety, including appropriate supervision.

Examples of lifting machinery which is not specifically designed for lifting people but which could be used if the necessary precautions are taken include a forklift truck, a telescopic handler, and a crane (fixed or mobile). When fitted with a suitably designed carrier or working platform, these can provide a safer alternative to other means of access (such as a ladder). However, such an arrangement will not provide the same level of safety as purpose-built equipment such as a mobile elevated work platform (MEWP).

11.8. Marking of Lifting Equipment

a. Machinery and accessories for lifting loads are clearly marked to indicate their safe working loads;

b. Where the safe working load of machinery for lifting loads depends on its configuration then the machinery is clearly marked to indicate its safe working load for each configuration;

c. Information, which clearly indicates its safe working load for each configuration, is kept with the machinery;

d. Accessories for lifting are also marked in a way that it is possible to identify the characteristics necessary for their safe use;

e. Lifting equipment, which is designed for lifting persons, is appropriately and clearly marked to this effect.

11.9. Colour Coding

It is mandatory to ensure all portable, circulating, and fixed lifting equipment is colour-coded to give a visual indication of its certification status. A colour code cycle shall be used to indicate the current lifting accessories in use, such as chains and wire ropes, webbing slings, hooks, shackles, eye bolts, swivels, blocks, snatch blocks, beam clamps, and plate clamps, lifting beams/spreader beams, etc.

11.10. Thorough Examination & Inspection

The employer, contractors, and users shall ensure that lifting equipment is thoroughly examined after installation and prior to service. Also, it shall be ensured that lifting equipment, which is exposed to conditions causing deterioration, which is liable to result in dangerous situations, is thoroughly examined:

a. In the case of lifting equipment for lifting persons or an accessory for lifting, at least every 6 months;

b. In the case of other lifting equipment, at least every 12 months;

c. In either case, in accordance with the examination scheme in Table 11-A;

d. Each time that exceptional circumstances which are liable to endanger the safety of the lifting equipment;

e. If appropriate for the purpose, is inspected by a competent person at suitable intervals between thorough examinations.

Table 11-A: Lifting Equipment Frequencies for Testing/Inspection and Certification

S. N	Lifting equipment classification	Lifting equipment type	The mandatory inspection frequency interval
1	Class A1: Powered lifting machine	• Lifting equipment - including attachments for fixing, anchoring, or supporting equipment - that operate by means of motive power such as electric, hydraulic, or pneumatic or other powered means such as cranes, elevators, winches, etc.	Every twelve (12) months
2	Class A2: Powered lifting machine	• Personnel lifting equipment such as elevator, escalator, passenger hoist , window cradle, man basket, cranes used for lifting people.	Every six (6) months
3	Class B: Manual lifting equipment	• Lifting equipment - including attachments for fixing, anchoring, or supporting equipment - that operate solely by means of the operator without any powered assistance - such as are manual chain/lever block, jacks, trolleys, etc.	Every twelve (12) months
4	Class C: Lifting accessories	• Accessories used for connecting loads to lifting equipment such as slings, hooks, beams	Every six (6) months

Refer to ENAS technical requirement for lifting equipment inspection bodies, ETR-06

11.11. Competent Person

The competent person carrying out a thorough examination has appropriate practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined to detect defects or weaknesses and to assess their importance concerning the safety and continued use of the lifting equipment.

The competent person shall have a minimum of 3 years of hands-on experience within a relevant engineering discipline related to lifting equipment and appropriate knowledge of the relevant laws, local and admin orders, codes of practice, and inspection techniques. Nobody is allowed to perform inspection independently without having appropriate qualifications and training.

11.12. Authorised Persons

Only authorised persons with valid driving licences in the respective category, issued by the relevant authority shall be allowed to operate the lifting equipment like forklift/mobile crane.

All persons who use lifting equipment shall have received adequate competency training from RAKEZ approved 3rd party, for purposes of health and safety, including training in load charts and the lifting methods, which may be adopted when using the lifting equipment, any risk which such use may entail and precautions to be taken.

Any person who operates a MEWP shall have received training from a RAKEZ approved 3rd party. The MEWP operators must receive familiarisation training from the MEWP supplier.

Any person who supervises or manages the use of lifting equipment and operations shall have received adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.

11.13. Reports & Defects

A person making a thorough examination for an organisation shall:

a. Notify the organisation of any defect in the lifting equipment which in his opinion is or could become a danger to persons;

b. Submit a report of the thorough examination to the organisation and any person from whom the lifting equipment has been hired or leased;

c. The owner/user of lifting equipment who has been notified of defects shall ensure that the lifting equipment is not used before the defect is rectified.

11.14. Use & Maintenance

This regulation deals with the use and maintenance of lifting equipment. In addition to the pre-operational checks to be conducted by the operator before the commencement of the work, a system of regular maintenance by a competent person shall be in existence, and records kept and logged. They shall be

operated within defined safe operating limits, e.g. the maximum lift height and capacity. Equipment shall be properly maintained according to manufacturers' instructions on inspection, maintenance, and servicing. In addition to these checks, which shall be carried out by a competent person on a routine basis, the operator shall carry out a daily safety check. A record of all checks and repairs carried out shall be retained.

11.15. 3rd Party Inspection and Training Bodies

3rd party inspection and training bodies shall have valid accreditation from ENAS for the list of categories established by ENAS.

The 3rd Party inspection, training and auditing bodies shall be approved by RAKEZ to operate within RAKEZ jurisdictional areas.

11.16. Record Keeping

The employer, contractors, users of the lifting equipment shall ensure that the information contained in every report made to them is kept available for inspection:

a. In the case of a thorough examination of lifting equipment other than an accessory for lifting, until they cease to use the equipment;

b. In the case of a thorough examination of an accessory for lifting, for two years after the report;

c. Any EC conformity declaration received shall be kept for as long as the equipment is operated;

d. The initial declaration shall be kept until the equipment is disposed of;

e. Reports of thorough examinations and inspections shall be kept available for inspection at the place where the lifting equipment is being used. If this is not possible, the information shall be readily accessible;

f. Reports shall be readily available to the HS&E officer if required;

g. No lifting equipment shall leave any undertaking unless accompanied by physical evidence that the last thorough examination has been carried out and color-coded as per this protocol.

12. Environmental Controls

RAKEZ as the relevant authority has adopted all the requirements of Federal Law No 24 of 1999 For the Protection and Development of the Environment and all the subsequent Executive Orders. Employers therein must maintain compliance with all the above requirements. RAKEZ HS&E Department will monitor employers to ensure compliance is maintained and where it is not, then enforcement action may be taken. All industrial employers shall obtain an environmental licence from EPDA on an annual basis.

12.1. Air Environment

A clean air supply is essential to human health and that of the environment. But since the industrial revolution, the quality of the air we breathe has deteriorated considerably – mainly as a result of human activities. Rising

industrial production and the dramatic rise in traffic on our roads all contribute to air pollution in our towns and cities which, in turn, can lead to serious health problems.

The employer is required to ensure the following:

a. Ambient air quality must be maintained;

b. Air Pollution Source Standards shall be maintained within allowable emission limits of air pollutants emitted;

c. Employers discharging waste to the air environment shall exercise good control practice to meet maximum emission limits;

d. The EPDA and/or RAKEZ may prescribe any other control requirements or emission limits for any class of industry in addition to those listed above or where deemed necessary;

e. Open burning of any waste is prohibited:

- The generator of any emissions to the air environment shall adhere to air emission standards as per Cabinet Decree no. 12 of 2006;
- Exhaust ventilation shall be designed in a way that dusts, fumes, mists, vapours, or gases are not drawn through the work area of employees.

f. Areas wherein construction, modification, demolition, and/or other relevant activities are being conducted are required to comply with the regulatory requirements.

12.2. Water Environment

a. Industrial and domestic wastewater shall be segregated. Efforts shall be made to increase the potential reuse of each stream;

b. Employers are required to adopt waste reduction, reuse, and recycle (RRR) options in their operations;

c. The in-plant or overall pre-treatment facility may be required to meet specific pre-treatment effluent criteria. If required, the pre-treatment effluent criteria will be specified in terms of mass and/or concentration, and the performance level will be based on the best available treatment technology;

d. Direct discharge of any effluent, whether treated or untreated, to the harbor or open sea, is prohibited;

e. Any facility with a point of discharge of treated wastewater to the harbor or open sea shall hold a permit from the wastewater agency of PSD;

f. Soak ways for new facilities' industrial waste are prohibited;

g. The minimum volume of the bund areas for the bulk storage of fuel/chemicals/toxic/hazardous wastes shall be 110% of the volume of the largest tank within the bunded area;

h. An adequate spillage collection arrangement must be provided for all chemical storage areas.

12.2.1 Water Pollution Control

12.2.1.1 Wastewater Disposal

a. Sanitary (Domestic) Waste

I. Sewers

- RAKEZ, sewage treatment plants are designed only to accept domestic waste effluents. Industrial waste liquids shall not be discharged into the systems;
- The parameters of the final effluent for disposal within RAKEZ shall be in accordance with the requirements of the wastewater agency of PSD;
- Direct disposal of untreated wastewater on land, to the harbour, to the sea, or any other receiving environment is prohibited unless prior approval from the wastewater agency of PSD has been obtained;
- Potentially contaminated stormwater, e.g., Bermuda storage tanks, process area, etc shall be contained and analysed prior to disposal according to with standard of the Waste Water Agency of PSD.

II. Septic Tanks

As no sewerage system is available in some RAKEZ areas, the employer on land/plot premises is required to install/construct suitable sized septic tanks to enable regular disposal of domestic sewage through the wastewater agency of PSD. Existing soak ways shall be required to be phased out/blocked as soon as possible to prevent further bacteriological contamination of the soil and ground waters.

III. Gardens Sewage Treatment Plants (STP)/Other Sewerage Systems

For some special projects/cases, sewerage networks and STPs shall be constructed to cater to domestic/sanitary effluents and use of septic tanks shall be permitted only after wastewater agency of PSD approvals. Furthermore, soak ways for such discharges are prohibited.

b. Industrial Liquid Waste

I. Soak Ways

There is no industrial sewerage system in RAKEZ jurisdiction. RAKEZ does not permit soak ways for the disposal of industrial liquid waste. An adequate waste treatment plant shall be installed in accordance with standards of the wastewater agency of PSD to enable full recycling-reuse of wastewater generation and enable zero off-site discharge disposals;

II. Disposal in Wastewater Agency/RAKEZ Treatment Plants

Where all reuse-recovery-recycling options have been fully exhausted (if necessary as confirmed by a comprehensive waste management plan), RAKEZ facilities are not directly connected to wastewater agency networks. However, employers may be

permitted to discharge wastewater to wastewater agency sewage treatment plants (STP) through an approved tanker services employer. All related tankers operating in Ras Al Khaimah must obtain a 'permit for tanker employer' and 'permit for tanker vehicle' in these permits, standards, and locations to discharge are specified. The facilities may discharge industrial wastewater through tanker to the following wastewater agency's sewerage treatment plants of Al Hamra, Al Filaya, and Al Ghail. All parameters for discharge to wastewater agency STP shall follow the standards of relevant STP issued by the wastewater agency.

The discharge of any substance to the sewerage system by any means, which alone, or in combination with other substances that are hazardous to the normal functioning of the sewerage system, is prohibited. The following substances are prohibited from entering the sewerage system:

- Volatile substances with a flash point below 61°C;
- Polychlorinated biphenyls (PCBs), chlorinated pesticides, and other persistent chlorinated organic compounds;
- The wastewater agency may specify any other limit on any other parameter on a case-by-case basis;
- In case the facility holding a permit to discharge industrial wastewater to the sewerage system shall comply at all times with any requirements specified on the permit for quality and quantity of the waste, the taking of measurements, the monitoring of wastes, and the reporting of results.

III. Disposal of Liquid Hazardous Waste

As no industrial hazardous liquid waste disposal facility is available in RAKEZ, such wastes (hazardous liquids) need to be disposed of in the waste water agency as per their assessment. The relevant regulations need to be met in this regard. The employers shall get wastewater agency approval for such waste disposal.

12.2.1.2 Groundwater Protection

a. General

The employer shall not discharge wastes to any groundwater by means of a recharge bore unless that facility holds approval from the EPDA.

b. Irrigation Criteria

All facilities shall recycle wastewater back to its process of production or dispose of it off beneficially such as land irrigation provided that it meets the wastewater agency's standards.

c. Storm Water Control

Rainwater or stormwater from uncontaminated areas may be discharged into the marine environment. However, such water from the potentially contaminated/process areas shall be stored on-site and analysed/treated before final disposal.

12.2.1.3 Land Environment Protection

No facility shall cause any land - within the RAKEZ jurisdictional areas - to become polluted by any materials which cause or is likely to cause any detrimental impact on any protected beneficial use of the land environment or the groundwaters, or any activity dependent on the land environment.

12.2.1.4 Dewatering

Dewatering is the removal of water from solid material or soil by wet classification, centrifugation, filtration, or similar solid-liquid separation processes. Removing or draining water from an on-shore/off-shore construction site by pumping or evaporation. This is often done during the site development phase of a major construction project due to a high-water table. It usually involves the use of dewatering pumps. Methods of dewatering include well point, deep well, and educator systems.

Employers planning to conduct dewatering activities shall secure groundwater discharge permits from EPDA and PSD. For further guidance on this aspect refer to relevant guidelines.

12.2.1.5 Performance Testing

The wastewater point sources of industrial facilities, on a case-by-case basis, shall be liable for performance testing prior to a commercial operation. This is to ensure compliance with the relevant EPDA and PSD regulations.

12.2.1.6 Non-compliance on Relevant Standard

During Irrigation permits renewal, regulatory monitoring shall be mandatorily conducted by EPDA or PSD's approved Laboratory. Non-compliance of any parameter as proven by the treated wastewater analysis report shall be considered as a major offence in which a correction notice shall be issued initially.
Any subsequent non-compliance(s) shall be levied with a financial penalty.

12.3. Landscape

The employer shall ensure that all landscaping projects including residential development, commercial development, industrial development, parking spaces (temporary or permanent), pavements, roads/streets, and other public right-of-way parks and recreation fields developed by RAK Municipality for local roads and Ministry of Energy & Infrastructure for the federal roads.

12.3.1 Permits/No Objection Certificate (NOC)

All landscaping activities which directly or indirectly concern any section of this regulation shall secure a no objection certificate from RAKEZ. No activity shall commence without securing official NOC from TSS and violation(s) shall be subjected to penalties/sanctions assigned by RAKEZ.

12.3.2 Operating Standards

Standards to guide activities covered by this section as focus areas are herein presented, but are not limited, as follows:

12.3.3 Maintenance

Use of banned chemical-based herbicides and fertilisers/enhancers specified in the list of prohibited and restricted dangerous goods issued by EPDA and other applicable guidelines and regulations is strictly prohibited.

12.3.4 Tree Cutting, Clearing, Replacement, and/or Translocation

a. The existing natural landscape character (any natural native trees) shall be preserved to the extent reasonable and feasible;

b. Shall clearing be a result of physical limitation or a suggested development plan, the developer shall re-locate displaced trees to suitable areas within the development;

c. No person shall remove or transplant a tree without obtaining proper NOC from EPDA to cut/relocate Tree(s). For purposes hereof, "person" means the owner, developer, contractor/subcontractor, tenant and/or sub-tenant, and any entity or individual with an interest in the land on which the tree is located;

d. A NOC from EPDA shall be obtained by a utility employer before removal and translocation of the tree except in the case of emergency repairs. A NOC for tree removal and transplanting will be considered if:

   - That the removal of the tree will not result in erosion or other related problems;
   - If the subject tree affects or poses threats/risks to public health, safety, or welfare.

e. Any person(s) causing the removal of a tree, with or without transplanting, is in violation of this section and may be liable to penalties imposed by EPDA.

12.3.5 Disposal of Dead Trees

a. Appropriate measures for removal and disposal especially for pest-infested trees/plants shall be employed by the contractor to avoid possible spread or outbreak of the disease;

b. Geo-textile membrane and plastic cover for infected trees shall be used to prevent windblown materials that can spread the disease/pest until it reaches the disposal facility of PSD;

c. Treatment, cultivation, and reconditioning of soil shall be done prior to replacement planting.

12.4. Dangerous/Hazardous Materials

The import, storage, handling, disposal, and transportation of dangerous goods shall be as per the applicable rule and regulations.

RAKEZ or EPDA may prohibit or place controls on any environmentally hazardous substance or process which in his opinion poses a substantial risk to any person or the environment due to the storage, use, or disposal of the substance or the operation of the process.

When prohibited as per the integrated hazardous materials management system (IHMMS) – Government of Abu Dhabi (Refer to https://www.hazmat.ae), no facility shall use the substance or conduct a process involving any environmentally hazardous substance, except in accordance with the controls approved by the EPDA.

The objectives are to:

a. Use and produce chemicals in ways that do not lead to significant adverse effects on human health and the environment;

b. Review the commitment to the sound management of chemicals and hazardous wastes throughout their life cycle;

c. Implement relevant international conventions, e.g., Rotterdam, Stockholm recently ratified by the UAE Federal Environmental Agency on chemicals and hazardous waste.

12.5. Waste Management

Wastes can be produced from all activities of industry and commerce. Waste streams can include but are not limited to general, construction/demolition, industrial, radioactive and medical.

Waste, according to the United Nations statistics division, is defined as materials that are not prime products (that is products produced for the market) for which the initial user has no further use in terms of his purposes of production, transformation, or consumption, and of which he wants to dispose of. Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities. Residuals recycled or reused at the place of generation are excluded.

Improper waste management has resulting environmental and economic costs. Waste itself attracts pests such as rodents and insects which are known carriers of different diseases. Toxic waste materials such as those coming from industrial and medical activities and those that have been contaminated with a radioactive material have the ability to cause problems not only to living life in the environment but can also cause contamination to the atmosphere, soil, groundwater, and surface water. Some waste treatment and disposal methods emit significant amounts of greenhouse gases especially methane which is the major cause of the global warming phenomenon. The cost of waste management is often high. Efficient waste management and utilising other options such as reuse, recycling, and minimisation can significantly reduce economic costs.

However, all types of waste shall be treated and disposed of in accordance with the requirements of the PSD.

12.6. 3rd Party Waste Management Service Providers

Waste management services are being provided by several 3rd party providers registered with PSD. Waste management service includes collection and transport and waste recycling/processing.

12.7. Export of Waste – Basel Convention Protocols

The Basel Convention was set up to control the transboundary transport of hazardous wastes for disposal in other countries especially in developing countries where controls are minimal and dangers could develop. The convention defines categories of wastes to be controlled, divided into waste streams and waste containing certain constituents. The federal environmental law bans the import and transit of hazardous wastes because the UAE is a party to the Basel convention of transboundary movements on hazardous wastes. Export for recycling, recovery, and other purposes shall not be allowed if they are not listed within the UAE Ministry of Climate Change and Environment (MOCCAE) approval. No objection certificate (NOC) shall be issued by EPDA/PSD to employers planning to export wastes upon presentation of relevant documents such as but not limited to filled-out notification and movement documents (form as per the Basel Convention), etc.

The Basel Convention rules are also being applied to inter-emirate transport of wastes. No wastes shall be transported to other Emirates without prior approval from the concerned authorities. Inter-emirate transport of waste shall only be permitted if the waste recycling/processing/disposal facility has a higher standard than that of which is already available in the emirate of Ras Al Khaimah.

Appendix A: Glossary of Terms and Acronyms

A. Terminologies

Term	Description
Acceptable level	The concentration of an air quality Indicator shall not be exceeded more than once at any location in any 12-month period in order to protect the beneficial uses of the air environment
Air environment	The atmosphere and components of the atmosphere
Air pollutants	Any substances added into the air in sufficient concentration to produce a measurable negative effect on man, animals, vegetation, or materials. Such pollutants may be present as solid particles, liquid droplets, or gases
Approved	Acceptable to the regulatory authority based on a determination of conformity with principles, practices, and generally recognised standards
Audit	A systematic and independent examination and evaluation of data, statements, procedures, records, operations, and performances of an enterprise for a stated purpose, performed by a competent person, to determine the adequacy and compliance with established procedures, the authority regulations, and related documents, and to measure the effectiveness of implementation

Authorised person	An authorised/responsible person to undertake a specific task or tasks and possessing the necessary technical knowledge and experience
Beneficial use	Any use of any segment of the environment which is beneficial to public welfare, health, or enjoyment or of economic significance
Civil Defence	Civil Defence of any of the Emirates of Ras Al Khaimah
Competent person	A person possessing the knowledge and experience required for the performance of a specific duty or duties and acceptable as such to the relevant authority
Confined spaces	Confined spaces are limited or restricted means for entry or exit and are not designed for continuous employee occupancy. Confined spaces include, but are not limited to, any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well, or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk
Construction	The building, altering, improving, repair, or demolition of any structure or infrastructure, or the excavation/dredging and/or reclamation of a water body or land mass
Consultant	Registered consultant holding a valid licence as a consulting engineer from the UAE Economic Departments/RAKEZ
Contamination	The presence of a constituent, impurity, or some other undesirable element that spoils, corrupts, infects, makes unfit, or makes inferior material, physical body, natural environment, workplace, etc.
Contractor	A registered contractor holding a valid contracting licence from the UAE Economic Departments/RAKEZ
Dangerous goods	Implies to any material belonging to any of the classes 1-8 of dangerous goods (explosives, gases, flammable liquids, flammable solids, oxidising substances, and organic peroxides, toxic and infectious substances, radioactive material, and corrosive substances) as defined by the UN Committee of Experts.
Dangerous occurrence	Incidents involving, lifting equipment, pressure systems, overhead electric lines, electrical incidents causing explosion or fire, explosions, biological agents, radiation generators and radiography, breathing apparatus, diving operations, collapse of scaffolding, train collisions, wells and pipelines or pipeline works.
Disposal of waste	The discharge or deposit of waste into the environment, or the destruction of waste without significant residue
ENAS	Indicates Emirates National Accreditation System
Employer	Any business, organisation, or individual (occupier/tenant/owner/licensee/lessee/developer) that has granted a legal licence/permission by RAKEZ that occupies and/or operates within RAKEZ jurisdictional areas
Employee	Every male or female who works in return for a wage of whatever type in the service of the employer and under its management or supervision.
Environment	The land area, the water and air associated with it, and the settlements and habitats depend on these physical features. It is also defined as how people use, affect, and are affected by their surroundings
Environmental nuisance	Use of property or course of conduct that interferes with the legal rights of others by causing damage, annoyance, or inconvenience

EPDA	Indicates Environment Protection and Development Authority - Government of Ras Al Khaimah
Facilities	The facilities, buildings, or structures not involving routine occupation by human beings
Fencing	A wall or fence provided for aesthetic purposes to protect adjacent uses from potential noise, glare, trash, odour, visual disorder, or other detrimental effects
Fire protection	It is concerned with preventing or minimising the direct and indirect consequences of fire on people, and property. It contains all aspects of fire and life safety, including building construction and fixed building fire protection features, fire suppression and detection systems, fire water systems, emergency process safety controls, emergency firefighting operations, and fire prevention. It also includes aspects of the following dangers as they relate to fire protection: explosion, natural phenomenon, and smoke and water damage from fire
Flash point	The lowest temperature at which the vapour of a substance, mixed with air, will ignite when in contact with a source of ignition, but will then go out as there is insufficient vapour being given off to continue burning
Food Outlet	An operation that stores, prepares, packages, serves, vends, or otherwise provides food directly or indirectly for human consumption.
Food safety	Assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use by fulfilling all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.
Gas-free certificate	A certificate, on a special form for the purpose, issued by an authorised, duly qualified person confirming that the tank, compartment, or container was gas-free at the time of testing.
Good control practice	Technology and practices are commonly employed in a particular industry to control emissions or minimise waste.
Handling	Producing, mixing, assembling, storing, treating, conveying, transporting, or disposing of a substance or waste or any other way dealing with a substance or waste.
Hazard	Something with the potential to cause harm, covers health, injury, loss of production, and damage to plant and property.
Hazardous waste	Any waste deemed unsuitable for direct disposal to the environment, sewer or conventional landfill or any waste containing any of the components listed below, above a concentration specified by the authority, or any other substance which is considered by the authority to pose a risk to public health or the environment based on its toxic, mutagenic, corrosive, reactive, flammable or radioactive properties.
Health	The protection of people from illness resulting from exposure to hazardous substances and materials
Hot or cold work permit	Document issued by an authorised person permitting hot or cold work to be carried out during a specific period in a clearly determined area within the facility limits
HS&E Department	Indicates Health Safety & Environment Department - RAKEZ
Hygiene	A condition promoting sanitary practices that can prevent illness and maintain health.
Incident	Any unplanned event resulting in, or having a potential for injury, ill health, damage or other loss.

Inspection	A visual examination by a responsible person is carried out to determine whether, in so far as can be ascertained in such a manner, the equipment is safe for continued use
Landscape plan	The design and specifications for the placement of all natural and manmade features (such as plantings, fencing, buildings, parking, drives, walkways, etc.) within a specified exterior space; including the retention of existing viable features, as well as the introduction of new or replacement features to enhance the property and its appearance, minimising the potential for negative impacts upon public senses, and protecting the community environment
MOHAP	Indicates Ministry of Health & Prevention - UAE
MOI	Indicates Ministry of Interior - UAE
NFPA	Indicates National Fire Protection Agency - US: All official definitions contained in NFPA and its companion codes, standards, and publications shall apply.
NOC	Indicates No Objection Certificate issued by RAKEZ or other relevant authorities as an approval
Non-combustible material	a substance that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapours when subjected to fire or heat. Or; a substance that is reported as passing ASTME 136, Standard Test Method for Behaviour of Materials in a Vertical Tube Furnace at 750 ^{o}C
Person	A natural person or business or corporate body registered and conducting any activity or proposed activity in RAKEZ
Personal Protective Equipment (PPE)	Any device or appliance worn or held by an individual for protection against one or more safety and health hazards and any addition or accessory designated to meet this objective
Planting	The introduction of or retention of hedges, plantings, natural vegetative covers to beautify and enhance the property, controlling soil erosion and air temperature, reducing glare or noise, and screening adjoining uses
Pollution	Any exceeding of standards or objectives adopted by a relevant authority for any segment of the environment; or any detrimental Impact on legitimate beneficial uses of any segment of the environment, or causing conditions which would be hazardous to health or offensive to human beings and other living creatures or natural resources
Potable water	Water that meets the quality standards prescribed by World Health Organisation (WHO), 1984b, or water, which is approved for drinking purposes
Practicable	A level of duty defined by international law whereby action shall be taken where it is physically possible to do so. If it can be done it shall be done
Premises	The physical facility, its contents, and the contiguous land or property under the control of the permit holder; or, the physical facility, its contents, and the land or property which are under the control of the permit holder and may impact food outlet personnel, facilities, or operations, if a food outlet is only one component of a larger operation such as a health care facility, hotel, motel, school, recreational camp, or prison.
Project	The construction of a permanent building, or any other civil work on a leased property including any modifications or installations in pre-built facilities within the RAKEZ jurisdictional area

PSD	Public Services Department - Government of Ras Al Khaimah
RAK Municipality	Ras Al Khaimah Municipality
RAKEZ	Ras Al Khaimah Economic Zone - Government of Ras Al Khaimah
Reasonably practicable	A level of duty defined by international law where a decision can be reached based on the level of risk versus the cost which can be in terms of time, money, or effort
Refuse (waste)	Solid waste which is not carried by water through the sewage system
Regulation	Set of rules/laws to be adhered to including these and other regulations issued by the "authority"
Relevant Authority	Any government or similar department, commission, board, body, bureau, agency, authority, or administration body at national, provincial, or local government level, having administrative jurisdiction over the Parties, the Leased Premises, or the Property.
Responsible person	A person appointed by the Employer or the owner of the equipment, as the case may be, to be responsible for the performance of a specific duty or duties and who has sufficient knowledge and experience and the requisite authority for the proper performance of the duty or duties
Risk	The likelihood that a hazard will cause particular harm in the actual circumstances of use and the severity of the harm
Risk assessment (RA)	The identification, evaluation, and estimation of the levels of risks involved in a situation, their comparison against benchmarks or standards, and determination of an acceptable level of risk
Safety	The protection of the people from physical injury
Sewerage system	The tanker waste disposal sites, pump stations, sewers, and treatment plant operated by PSD or RAKEZ
Site	A location with construction or modification works of any kind within RAKEZ jurisdictional areas
Shall	Indicates mandatory
Stakeholders	Indicates employers, building owners, building managers, facility management, asset management, lessee, occupier, licensee, consultants, contractors, sub-contractors, relevant authority, accreditation agencies, design, and construction team, insurers, investors, neighbours, project management, building operations, and maintenance, tenants, licensees, lessees, and emergency responders.
SDS	Safety Data Sheet (newly called Safety Data Sheet)
Thorough examination	Means a detailed visual examination by a competent person, supplemented if necessary by other suitable means or measures, in order to arrive at a reliable conclusion as to the safety of the Item of equipment examined.
Treatment	Change in the physical or chemical composition or concentration of a substance to make it less hazardous or to make it acceptable at disposal facilities
UAE	United Arab Emirates
Waste	Any matter whether solid or liquid gaseous or radioactive which is discharged, emitted, or deposited in the environment in such volume or manner as to cause an alteration in the environment, any otherwise discarded, rejected, abandons, unwanted or surplus matter intended for recycling, reprocessing,

	recovery or purification by a separate operation from that which produced the matter, and any matter prescribed to be waste by RAKEZ.
Waste generator	A person or activity causing the production of waste by any process
3rd party	Any agency, employer, or institution that has undergone the scrutiny of documents and screening procedures that had been deemed suitable to provide services as per the stated type of activity in an awarded certificate of recognition the relevant authority

B. Fundamental Dimensions

Fundamental dimension	SI (*) unit		English unit	
Mass	kg (kilogram)	g (gram)	Ton (ton)	lb. (Pound)
Length	m (metre)	cm (centimetre)	'/ft (foot)	''/in (inch)
	mm (millimetre)			
Time	hr. (hour)	s (second)	hr. (hour)	s (second)
Area	m^2 (square metre)	cm^2 (square centimetre)	ft^2 (square foot)	in^2 (square inch)
Volume	m^3 (cubic metre)	cm^3 (cubic centimetre)	ft^3 (cubic foot)	in^3 (cubic inch)
Temperature	K (Kelvin)		R (Rankine)	
Electric Current	A (ampere)		A (ampere)	
Angle	˚ (Degree)		˚ (Degree)	
Amount of light (luminous intensity)	c (candela)		c (candela)	
Amount of matter	mol (mole)		mol (mole)	

(*) SI: International System

Appendix B: First Aid Arrangements

First aid training shall be given by a qualified first aid training provider approved by RAKEZ. As per the requirement of Ministerial Resolution No (37/2) for 1982 Article 3

The number of appointed and/or first aiders in different workplaces shall be as per Table B-1.

Table B-1: Number of First Aiders Associated with Each Category of Risk

Category of risk	First-aid personnel
Low Risk, e.g. shops, offices:	
• < 50 employees • between 50 to 100 employees • > 100 employees	• At least one appointed person • At least one full time first-aider • One more full time first-aider to every 100
Medium Risk, e.g. light engineering and assembly work, food processing, warehousing:	
• < 20 employees • between 20 and 100 employees • > 100 employees	• At least two appointed persons • At least two full time first-aiders for every 50 • One more full time first-aider for every 100
• **High Risk**, e.g. most construction, chemical manufacture, extensive work with dangerous machinery:	
• < 5 employees • between 5 to 50 employees • > 50 employees • Facilities with specific high-risk activities such as the risk of poisoning for which treatment with an antidote may be needed, or where hazard justifies additional first-aid facility	• At least two appointed persons • At least two full time first-aiders • One more full time first-aider for every 50 employed • At least two first aiders trained in the specific emergency action

A valid certificate of qualification as a first-aider from RAKEZ approved third party training agency need to be available with the first aider and it required to be displayed near first aid boxes/first aid rooms. First-Aiders shall be trained in the following techniques and be knowledgeable about:

1. Resuscitation;
2. Treatment and control of bleeding;
3. Treatment of shock;
4. Management of unconscious casualty;
5. Contents of first-aid rooms;
6. Purchasing first-aid supplies;
7. Transport of casualties;
10. Treatment of minor injuries;
11. Treatment of burns and scalds;
12. Eye irritation;
13. Poisons;
14. Treatment of a casualty overcome by gas/fumes
15. Simple record keeping;
16. Personal hygiene in treating wounds; and

8. Recognition of illness;
9. Treatment to injuries to bones, muscles, and joints
17. Communication and delegation in an emergency.

Workplaces shall have a first aid facility established as per Table B-2.

Table B-2: Number of First Aid Facilities and First Aiders Associated with Number of Employees

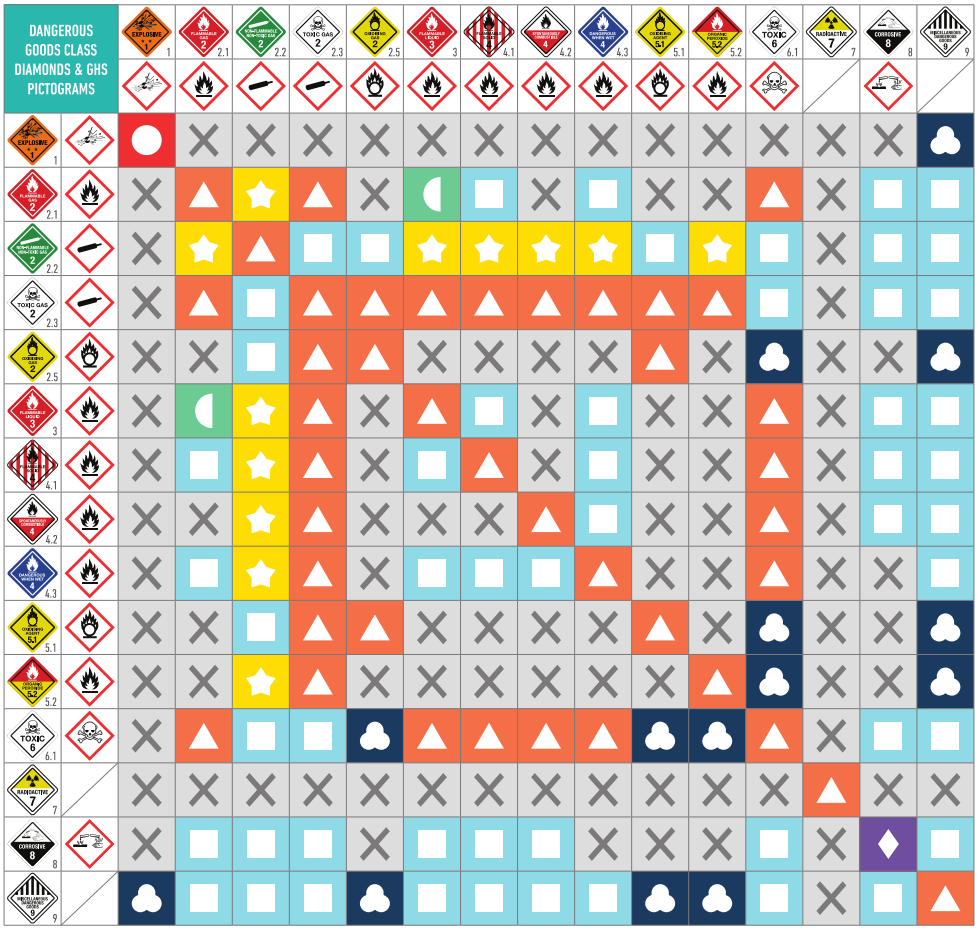
	1 - 50	51 - 150	151 - 250	251 - 1000	> 1000
No. of first-aid boxes stocked	2	4	6	2 boxes per 50 employee/In each work area	
First-aid room		Yes	Yes	Yes	Yes
Trained certified first-aiders	Yes	Yes	Yes	Yes	Yes
Nurse				Yes	Yes
Doctor					Yes

The minimum requirements for first aid box contents are defined in Ministerial Order no. 32 of 1982/any subsequent ministerial orders for first-aid requirements. Any medicine shall be administered only by an authorised medical practitioner or to be taken only after consultation with the medical doctor.

Appendix C: Segregation Between the Dangerous Goods Storage

DANGEROUS GOODS COMPATIBILITY CHART

This chart is designed to provide the user with practical guidance for the storage of dangerous goods. It is not intended for use of minor quantities. The segregation chart shows the dangerous goods class diamond and the equivalent pictogram as per Globally Harmonized System (GHS).



CLASS TYPES

1 Explosives
2.1 Flammable Gas
2.2 Non-flammable Non-toxic Gas
2.3 Toxic Gas
2.5 Oxidising Gas
3 Flammable Liquid
4.1 Flammable Solid
4.2 Spontaneously Combustible
4.3 Dangerous When Wet
5.1 Oxidising Agent
5.2 Organic Peroxide
6.1 Toxic
7 Radioactive
8 Corrosive
9 Miscellaneous

KEY

- Most classes of explosives cannot be stored with different classes of explosives. All explosive classes are not permitted within RAKEZ areas
- Dangerous goods of the same class are normally considered compatible and can be stored together. Dangerous goods of different classes and normally unreactive with, can be stored together but consideration should be given to an escalation of risks in the event of fire, etc.
- If Class 2.2 has a subsidiary risk of 5.1, then do not store together. Cannot be stored together when both classes are in bulk (A container with a capacity exceeding 500 l or 500 kg. If the dangerous goods are solids, an undivided quantity not exceeding 500 kg)
- X Don't keep together
- Normally these can be stored together. There may be some exceptions and the SDS should be consulted for compatibility.
- If Class 6.1 or 9 is a fire risk then don not store with oxidizing agents. In the case of an explosive (Class 1), it relates only to Class 9.
- If one material is a concentrated strong acid and the other a concentrated strong alkali they cannot be stored together.
- When both classes are in bulk they must be segregated. Bulk is defined as:
  a. in a container with a capacity exceeding 500 l or net mass of more than 500 kg; or
  b. if the dangerous goods are solids, an undivided quantity exceeding 500 kg

Appendix D: References

- Federal Law no. (8) of 1980 for the Labour Law
- Federal Law no. (21) of 1995 for the Federal Traffic Law
- Federal Law no. (24) of 1999 for the Protection & Development of the Environment
- Federal Law no. (14) of 2014 for the Prevention of Communicable Diseases
- Federal Law no. (4) of 2015 for the Private Health Facilities
- Federal Law no. (12) of 2018 for the Integrated Waste Management
- UAE Fire & Life Safety Code of Practice
- Federal Authority for Nuclear Regulation (FANR) Regulations (1-29)
- The Electricity Wiring Regulation Book - Etihad WE
- Emirates National Accreditation System (ENAS) - ETR 06: Technical Requirement for Lifting Equipment Inspection Bodies
- UAE Ministerial Resolution no. (32) of 1982 for the Determining Prevention Means and Measures
- UAE Ministerial Resolution no. (37/2) of 1982 for the Level of Medical Attention the Employer is Obliged to Provide to His Workers.
- Executive Council Resolution no. (4) of 2020 of Emirates of Ras Al Khaimah
- Ras Al Khaimah Building Regulations and Specifications
- Barjeel Ras Al Khaimah Green Building Regulations
- Law no. (2) of 2009 for the Food Control in Emirate of Ras Al-Khaimah
- Law no. (3) of 2015 for the Technical Systems for Establishments Security in Emirate of Ras Al-Khaimah
- Environment, Health, and Safety (HS&E) Regulation - Trakhees-Ports, Customs, and Free Zone Corporation (PCFC).
- Health Safety and Environment - Abu Dhabi Municipality
- Abu Dhabi Occupational Safety and Health System (OSHAD)
- Integrated Hazardous Materials Management System (IHMMS) – Government of Abu Dhabi
- Emirates National Accreditation System (ENAS)
- Ministry of Industry and Advanced technologies

Appendix E: Related Documents

- GUIDANCE FOR OBTAINING OPERATION FITNESS CERTIFICATE (OFC) (HSE-GU01)
- OPERATIONS FITNESS CERTIFICATE (OFC) APPLICATION (HSE-GU01.F01)
- OFC PROCESS FLOWCHART (HSE-GU01.FL01)
- GUIDANCE FOR OBTAINING HS&E NOC (HSE-GU02)
- HS&E NOC APPLICATION – IMPORT / STORAGE OF CHEMICALS (HSE-GU02.F01)
- INVENTORY UPDATE FORM FOR CHEMICALS (HSE-GU02.F01-A)
- HS&E NOC APPLICATION – RADIOGRAPHY (HSE-GU02.F02)
- HS&E NOC APPLICATION – LIFTING EQUIPMENT (HSE-GU02.F03)
- HS&E NOC APPLICATION – LPG CYLINDERS / TANKS (HSE-GU02.F04)
- HS&E SERVICES & FEES (HSE-SF01)
- INCIDENT NOTIFICATION FORM (HSE-RR01.F01)

Appendix F: List of HS&E-related NOC/Permits/Certificates from Relevant Authorities

Relevant Local/Federal Authority	NOC/Permit/Certificate Type	Frequency	Required for
RAK Civil Defence	Building completion certificate	One-off	All customised facilities inland plots
	No objection certificate	One-off	All modified facilities
	Certificate of compliance with building protection and safety requirements (Building Safety Certificate)	Annual	All employers operating land plots
	Certificate of compliance with preventive safety requirements (Facility Safety Certificate)	Annual	All employers operating in warehouses and retail
Environment Protection and Development Authority (EPDA)	Environmental permit	Annual	All employers having an industrial licence
RAK Municipality- Public Health Department	NOC	Annual	Food, human consumption/application (only warehouse & land)
Ministry of Health & Prevention (MOHAP)	NOC	Annual	Medical products
For Hazardous Chemical Import/Storage/Usage			
Environment Protection and Development Authority (EPDA)	NOC for importing restricted chemicals.	Per shipment	All employers importing restricted chemicals as listed in www.hazmat.ae
RAKEZ	NOC for import of restricted chemicals	Per shipment	All employers importing restricted chemicals after obtaining EPDA NOC.
RAKEZ	NOC for storage/usage of hazardous chemicals	Annual (Per 10 chemicals)	All employers storing/using hazardous chemicals as per GHS categorization.
For Radiography			
FANR	Licence/Permit use, manufacture, handle, store, import or export, transport and dispose of radioactive materials	Per Three Years	All employers handling radioactive sources.

RAKEZ	NOC for Radiography	Per year or expiry of FANR licence (Whichever comes first)	All employers handling radioactive sources after obtaining FANR licence.
For Usage of Lifting Equipment			
MOI	Vehicle registration	Annual	Motor vehicle lifting equipment (That are allowed to be driven on road).
RAKEZ registered 3rd party consultants	Equipment and Operator Test Certificate	Six Months	All employers using powered lifting Equipments.
RAKEZ	NOC for Usage of Lifting Equipment	Per six month or expiry of equipment certificate. (Whichever comes first)	All employers using powered lifting Equipments.
For Usage of LPG cylinder/Tank			
RAK Civil Defence	NOC for completion of LPG installation	One-off	All employers using LPG cylinder/tank
RAKEZ	NOC	Per application per year	All employers using LPG cylinder/tank after obtaining NOC from RAK Civil Defence