

مــؤســسـة الــمــوانئ والـجــمـارك و الـمـنـطقـة الــحــرة PORTS, CUSTOMS & FREE ZONE CORPORATION

HEALTH & SAFETY AND FIRE REGULATIONS & STANDARDS



ENVIRONMENT, HEALTH & SAFETY

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PREAMBLE

The Health, Safety & Fire Protection Regulations & Standards for PCFC clients and all the Business Units operating under Dubai World, provide broad standards for ensuring a high level of safety to people, property, equipment and against hazards associated with industrial, marine and commercial operations jn areas under PCFC jurisdiction. This document should be read in conjunction with PCFC-EHS : Health & Safety Guidelines, Environmental Guidelines, Environmental Control Rules & Requirements (all separately published) and other applicable local / federal HS&E requirements. These H&S and Fire Protection Regulations & Standards supersede those embodied in all other Rules and Regulations of PCFC.

The regulations have been upgraded to include provide fire protection planning, design, construction, sustainment, restoration, modernization, fire prevention and fire control criteria. They will be periodically reviewed, updated and made available to users as part of EHS responsibility.

The Corporation (Authority) operates under a system of prior and continuous approval, and no operation may commence until the facility/operations have been inspected and the Authority is satisfied that it meets its requirements and is fit to operate. The licensee/occupier is also responsible by the Law under Ministerial Decision No. (32) of 1982 and other federal /state regulations for the protection of their staff from risks at work, injuries, disease, fire etc. that may result, and he must take the appropriate precautions to the satisfaction of the Authority. Relevant international Regulations & Guidelines such as Health & Safety Executive (HS&E - UK), OSHA, NFPA, IAEA, API, ASME and ASHRAE standards will be the baseline/ reference line for any requirements that have not been referred in this booklet.

EHS is authorized to make visits to all facilities/operations to ensure that the standards and requirements are being met. During these visits, unsatisfactory circumstances may be found, which need correction and these are drawn to the attention of the Company's senior management. Should any company / lessee not respond positively to notifications from EHS, then EHS will be constrained to take necessary actions /apply appropriate sanctions to ensure a safe and clean environment. Please ensure that you study this book and keep this publication readily for your reference. We look forward to your cooperation to enhance Environment, Health & Safety Standards.

SULTAN AHMED BIN SULAYEM Chairman Dubai World

DEFINITIONS & ABBREVIATIONS

Access	includes egress
ACGIH	American Conference of Governmental Industrial Hygienists
API	American Petroleum Institute
ASHRAE	American Society of Heating Refrigerating Air-Conditioning Engineers.
ASME	American Society of Mechanical Engineers.
Authority	Shall mean Ports, Customs & Free Zone Corporation (PCFC).
Authorized person	Means a person authorized by the authority, the master of the ship or a responsible person to undertake a specific task or tasks and possessing the
Authorized person	
Berth	offshore terminal, or any other place regularly used for berthing or mooring
Civil Defence	Civil Defence of any of the Emirates of LIAE
COC	Certificate Of Conformity
666	shall mean Environment, Health & Safety (EHS) Department of the PCEC
Competent Department	(Also referred as Authority Having Jurisdiction -AHJ)
Consultant	Registered consultant holding a valid consulting Engineers' license from the Dubai Economic Department.
Contractor	Registered contractor holding a valid contracting license from the Dubai
Contractor	Economic Department.
	concerned "Authority" of DCEC on behalf of the lessee for facility
Developer	construction/development works
DM	Dubai Municipality
DoH&MS	Department of Health & Medical Services, Government of Dubai
	Dubai Port Authority
	DB World
EHS	denotes Environment, Health & Safety
EIIS	Means a certificate, an a special form for the purpose, issued by an
Gas-free certificate	authorized, duly qualified person confirming that the tank, compartment or container was gas free at the time of testing.
	Tugs, pilot boats, barges, lighters for discharging and loading, power driven vessels, and other craft and any other thing constructed or adapted for floating on or being submersed in water (whether permanently or
Harbor Craft	Port limits.
	Document issued by an authorized person permitting hot or cold work to be carried out during a specific time period in a clearly determined area within
Hot or cold work permits	the port limits.
HS&E	Health, Safety & Environment
IAEA	International Atomic Energy Agency
	The facilities, buildings or structures involving routine occupation by human
Inhabited	beings.
JAFZA	Jebel Ali Free Zone Authority.
lessee	Occupier/tenant/owner/Client that occupies and/or operates within a premises within PCFC jurisdiction
Licensee	Occupier/tenant/owner/Client having a license to operate in any areas falling within PCEC jurisdiction
	All stationary or mobile same handling appliances including show based
	power-operated ramps, used on shore or on board ship for suspending, raising or lowering loads or moving them from one position to another while
Lifting appliance	suspended or supported;

Loose gear	Any gear by means of which a load can be attached to a lifting appliance but which does not form an integral part of the appliance or load
Main Contractor	The employer who is responsible for the compliance of the EHS & DM Regulations for all parties on a project under their contract.
	Any person, (not the pilot) who is authorized to command the vessel and has
Master	personal responsibility for her.
NFPA	and its companion codes, standards & publications shall apply
Owner	When used in relation to a vessel, includes any part owner , broker, charterer, agent, or mortgagee in possession of vessel, or other person or persons entitled for the time being to the possession of the vessel, whether the holder of the legal title to the vessel in accordance with the registration certificate or otherwise and when used in relation in good, includes any consignor, receipt, custody, loading or unloading and clearance of those good sand includes any other person in charge of the goods and his agent in relation thereto.
PCFC	Ports, Customs & Free Zone Corporation - The Authority
Permanent Building	means the building designed and constructed with concrete/steel; with block or metal cladding or other durable material.
	Any person assigned or permitted from the port authority to practices vessel's pilotage within the port zone or the pilotage zones. The pilot job does not include, under any indirectly. Legally, the pilot assignment is only as advisor
PIIOT	to the vessel's master. All areas under the control of port management and includes land and sea
Port	areas in addition to infrastructure, channels and anchorages of Port Jebel Ali, Port Rashid and Port Hamriya
Port Management	PCFC : Dubai Port Authority, to be in charge of and responsible for the administration and control of a port, and includes support units as they are authorized to act on its behalf.
Port Premises	All quays, jetties, piers, landing places, dry docks, slipways, workshops, transit sheds, warehouses, open stacking areas, road and buildings under the administrative and operational control of the management of the port.
Practicable	A level of duty defined by international law where by action must be taken where it is physically possible to do so. If it can be done it must be done.
Project	means the construction of a permanent building, any other civil work on a leased property including any modifications or installations in pre-built facilities within PCFC jurisdiction.
	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,
Reasonably Practicable	money or effort.
Regulation	A person appointed by the employer, the master of the ship or the owner of the gear, 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
Responsible person Shall	the requisite authority for the proper performance of the duty or duties. indicates mandatory
Chin	covers any kind of ship, vessel, barge, lighter or hovercraft, excluding ships of
Sulp	War. Means any company, firm, or person duly licensed by the Port authority to provide the ship's agency services and authorized by the ship owner
Ship's Agent	charterer, or operator.
Site	EHS designated areas.
Special tools	Tools that require training in their use from the manufacturer. Means an employer of workmen who is working under the main contractor
Subcontractor	and abides by the main contractors requirements and complies with site EHS

	requirements.
Substandard ship SWL	A ship whose hull, machinery, equipment, or operational safety is substantially below the standards required by the relevant convention of IMO, or whose crew is not in conformance with the safe manning document. Safe Working Load
Temporary Building	A building used as a site office or to house construction equipment during the construction period.
Uninhabited	means the facilities, buildings or structures not involving routine occupation by human beings.
Vessel	The word vessel shall include every description of ship, boat, raft or water craft of any description, including non-displacement craft and seaplanes, use or capable of being used as a means of transportation on water, irrespective of its means of power.
Water Pollutants	Any substances which when discharges into the water environment, intentional or unintentional, direct or indirectly changes its properties in a manner which harms human beings and other living creatures or natural resources or the water environment or tourist areas or interferes with other authorize uses of the water environment.
	The introduction of any substance or energy into water environment by intentional or unintentional , direct or indirect means which may adversely affect living or nonliving resources, endangers human health or impedes water activities including fishing and tourism or impairs the quality for use or
Water pollution	changes the properties of water.

PART - I : HEALTH & SAFETY REGULATIONS AND STANDARDS

<u>SECTION – 1</u> <u>RESPONSIBILITIES</u>

1.0 – MAJOR ARTICLES (EMPLOYER & WORKER RESPONSIBILITIES)

Article 1

Every employer shall provide adequate preventive and protective equipment /conditions to protect workers against the dangers of accidents and occupational diseases that may occur during the work, and also against fire hazards and other hazards that may result from the use of machines, equipment or any operations. He shall also adopt all Regulations, guidelines, work instructions etc. issued by the Competent Department from time to time. Every worker shall use the protective equipment and the clothing supplied to him for this purpose, shall comply with all instructions given by the employer to protect him against hazards, and shall not take any action liable to hamper compliance with such instructions. In the same regard, all facilities, machinery/ equipment installation, material storage, and/or operations shall need to be approved by the Competent Department prior to operating therein.

Article 2

Every employer shall display detailed instructions in a conspicuous position at the workplace indicating the measures to be taken to prevent fire and/or protect the workers against hazards to which they may be exposed while performing their work. Such instructions shall be in English / Arabic and in another language understood by the worker.

Article 3

Every employer shall provide one or more first-aid boxes containing medicines, bandages, antiseptics and such other first-aid material as may be required depending on the nature of work and as per guidelines of the Competent Department. There shall be at least one first-aid box for every 100 workers. The box shall be located in a conspicuous place and within easy reach of the workers. Use of the box shall be entrusted to a person specialized in giving first aid.

Article 4

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

Article 5

Notifiable Diseases - An employer shall arrange for approved (by DoHMS & EHS) medical institutions to carry out pre-employment and subsequently, periodic detailed medical examinations at intervals of not more than six months on those of his workers (in the opinion of the Competent Department) who are exposed to the danger of contracting any of the infectious/ occupational diseases. These diseases could fall under a) Diseases caused by agents (chemical, physical, biological); b) Diseases of target organ systems (respiratory, skin, musculoskeletal) c) Occupational cancer. **Table 1** indicates some of the typical occupational diseases that need to be assessed and reported. Any abnormal results of the periodic medical examinations shall be brought to the notice of the Competent Department immediately after the facts have been ascertained by means of medical and laboratory tests/ the necessary procedures and the employer shall enter the findings of such examination may require any worker who is exposed to occupational disease to be re-examined at suitable intervals, depending on the worker's condition. The Competent Department may direct the employer to take suitable preventive and/or corrective actions in regard to the workers' well being.

Article 6

An employer shall provide his workers with medical care facilities corresponding to the standards laid down by the Country and the Emirate of Dubai.

Article 7

The Competent Department is authorized to prescribe the general and/or specific HS&E precautions and health protection measures applicable to all establishments employing workers under the jurisdiction of PCFC from time to time and it remains the responsibility of the lessee/employer to update himself with the relevant HS&E requirements to ensure that all such precautions are taken.

Article 8

The employer or his representative shall inform each worker at the time of his recruitment of the dangers associated with his occupation and of the protective measures he must take, 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 prior to permitting the employee to work on any equipment/area.

Article 9

Every worker 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 a worker to commit any act leading to non-compliance with such instructions, to the misuse of the equipment provided for protecting the health and safety of the workers or to the damage or destruction of such equipment. An employer may, include in the disciplinary code, penalties to be imposed on workers contravening the provisions of the same. However, it remains the responsibility of the employer to ensure that all employees are fully aware of HS&E requirements at his workplace through suitable documented training, awareness drives etc.

Article 10 – SANCTIONS & PENALTIES

There are three broad types of unsatisfactory circumstances that have been identified:

<u>Grade 1</u> - Where there is a serious con-conformity and/or imminent danger to health or safety of the workers or other persons of the general public, a <u>Prohibition Notice</u> will be issued requiring immediate closure of the offending unit until the fault is corrected.

<u>Grade 2</u> - Where there is a major fault with a potential danger to the health or safety of workers/public, but where it is considered that time can be given for correction; a <u>Correction Notice</u> will be issued setting out a time schedule for correction.

<u>Grade 3</u> - There could be other circumstances which detract from the appearance and proper functioning of the works with a potential for HS&E impacts and which are drawn to the attention of works management either orally or by letter. Where the works/licensees are persistent offenders or ignore persuasion, a <u>Warning</u> <u>Notice</u> will be sent, setting out a schedule of correction.

The Employer/Owner/Company/Occupier has the ultimate responsibility to ensure adherence to the above Articles mandatorily and failure to comply with the Articles as above, may result in Sanctions (administrative/ legal/operational) as determined by the Competent Department and /or Penalties as laid down in the EHS Tariff.

1.1 – ROLE OF AUTHORITY / COMPETENT DEPARTMENT

Without limiting the actions of the Competent Department of the Authority (PCFC – EHS) in the protection of Health & Safety, the Competent Department is empowered to and responsible for:

- a) Issue/amend necessary Regulations, guidelines and codes of practice for the safe conduct of work
- b) Inspect all work places, take samples or photographs and issue directions/instructions to ensure compliance with Health & Safety requirements
- c) Issue Correction/Warning/Prohibition Notices and/or penalties where deemed required.
- Prepare and execute education/training/awareness programs and / or recommend programs in Health & Safety and/or Fire protection
- e) Liase with and advise Local/Federal Government Departments (where applicable) on status of noncompliant companies/ licensees to enable necessary actions.

1.2 – ENFORCEMENT BY THE AUTHORITY

The Competent Department (EHS) shall be responsible for the enforcement and implementation of these regulations for the protection of the Health & Safety of workers at all sites/locations under the jurisdiction of PCFC (Authority) and operating under Dubai World.

1.3 – HS&E REPRESENTATIVE / HS&E OFFICER

The occupier of all industrial/commercial establishments shall appoint at least one HS&E representative for each workplace. The HS&E representative shall be competent to address the Health & Safety Requirements of the organization and shall at all times ensure that HS&E Requirements of the Authority are met. Where an employer employs in excess of 100 persons (or where, in the opinion of the Competent Department, any activity, manufacturing process or operation is carried out, where the process or operation involves any risk of life or bodily injury, poisoning or disease, or any other hazard to health to the persons employed), a full time HS&E qualified Officer shall be employed in the factory.

1.4 – QUALIFICATION OF HS&E OFFICER

The duties, qualifications of the HS&E Officer shall include the following:

- Practical experience of working in a similar establishment in a supervisory capacity for a period of not less than three years, or experience not less than three years in training, education, consultancy or research in Health & Safety and
- b) Possesses
- A Degree/Diploma in any branch of Engineering or Technology or a Degree in Science with
- A 1 year Diploma/Certificate course in Industrial Safety and
- Possesses an adequate knowledge of English and the native language(s) of the worker(s).
 Knowledge of Arabic is an advantage.

1.5 – DUTY AND RESPONSIBILITY OF HS&E OFFICER

The duties of the HS&E Officer shall include the following:

- a) Ensure that his facility/operations at all times are in compliance with EHS requirements.
- b) Inspection of all work places, the promotion of the safe conduct of work, hazard identification techniques and communication of corrective measures to management
- c) Issuance of Hot/Cold Work permits for all non-routine works.
- d) Maintaining "Eye wash/Safety Shower (if required)", first aid facilities and personal protective equipment as demanded by the nature of the work/Material Safety Data Sheets.
- e) Investigating of all type of accidents & Reporting to EHS as well as accident prevention and maintaining accident records
- f) Training of workers and ensuring that they are issued with adequate instructions and creating awareness of safe work practice among them.
- g) Carrying out Job Safety Analysis to determine "Hazards of the operations/activity" and facilitating suitable solutions.
- h) Ensuring that the provisions of this Document, its references and Dubai Municipality Local Order/ Regulations /guidelines (where applicable) are complied with. (See also <u>www.dm.gov.ae</u>)

- Maintain a record for "all chemicals/dangerous goods" used/stored at the premises, their Material Safety Data Sheets and advise management/staff on safe handling/transport & storage practices. (Refer also DM Code of Practice for Management of Dangerous Goods in the Emirate of Dubai")
- j) Conducting HS&E Audits on regular basis & advise management for necessary action.
- k) Liase with members of EHS on a regular basis to ensure that all Local/State/Federal Health & Safety Requirements are met.

1.6 – RESPONSIBILITY OF MEDICAL PRACTITIONERS

Any medical practitioner/institution and/or any employer, aware of any occupational illness affecting any worker in establishments under PCFC jurisdiction must inform the Competent Department and recommend suitable medical actions required by the employer which may be enforced by the Competent Department.

1.7 - RESPONSIBILITY OF COMPANIES TOWARDS THIRD PARTY CONTRACTORS / VISITORS

All companies/lessees shall be responsible to ensure that contractors/third party workers operate within their premises only after the written approval from the Competent Department(s). The health and safety of all visitors to the premises of any tenant shall remain the responsibility of the main tenant. It is not permitted to allow access of minors/medically unfit/challenged persons into an industrial premises.

1.8 - RESPONSIBILITY OF THIRD PARTY CONTRACTORS / VISITORS

All third party contractors /visitors to the premises of a licensee/lessee under PCFC shall abide by the Rules and Regulations as set out by the Authority as well as the conditions that may be issued by the lessee/licensee during the period of his visit/duties at the lessees premises.

1.9 - RESPONSIBILITY OF CONSULTANTS

All consultants in Engineering/HS&E aspects shall be 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, and similar reasons. The consultants shall be caused to complete and compensate for any such losses or damages pursuant to the laws of the UAE. EHS or any other departments of PCFC and their directors, officers & 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.

SECTION 2 OCCUPATIONAL HEALTH & SAFETY

2.0 – SCOPE

This Section addresses broadly the major Occupational Health & Safety aspects that need to be adhered by companies/ establishments during their operations in PCFC jurisdictional areas.

2.1- PROTECTION OF EMPLOYEES

Employers must provide appropriate proactive and preventive measures for protection of their employees from risk of injury or occupational disease, fire risks or other kinds of risks which may result from the use of machinery and other equipment, handling of chemicals/ toxic substances or performing any other work at the work place. All employees must use the protective equipment and clothing provided for this purpose.

2.2 – DUTIES OF EMPLOYEES

Employees are to be informed of their responsibilities which are :

- 1. Follow correct instructions, don't take chances, if you don't know, ask.
- 2. Correct / Report unsafe conditions, and help to keep everything clean and orderly.
- 3. Use right tools and equipment for the job, use them safety.
- 4. Report all injuries, get first aid promptly.
- 5. Use, adjust and repair equipment only when authorized.
- 6. Use prescribed equipment, wear safe clothing, and keep them in good condition.
- 7. Don't horseplay, avoid distracting others.
- 8. When lifting, bend your knees, get help for heavy load.
- 9. Comply with all safety rules and signs.

2.3 – SAFE WORKING CONDITIONS

The employer and occupier of any work place/industry/factory/construction site has a responsibility to provide safe working conditions/environment, Safety Gears/ Personal Protective Equipment for all employees and take necessary actions to prevent incidents and accidents at the work place.

2.4 - SAFETY POLICY

The occupier of any work place employing over 100 staff and/or carrying out activities with potential risks, shall prepare a Safety policy and HS&E manual to the satisfaction of the Competent Department and shall post this manual/policy in prominent locations at the workplace in languages generally understandable by the workers.

2.5 – SAFETY MANAGEMENT

Depending on the needs, EHS may formulate and adopt relevant and suitable codes of practice (not included in this document) or Issue additional guidelines to ensure the protection of the Health & Safety of the workers.

2.6 - OCCUPATIONAL H&S RISKS

Lessees or their representatives must initially ensure that the 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 fire, machinery risk, risk from vapour or dust of toxic substances, danger of falling and relevant occupational diseases etc. Suitable Training should be given to all staff involved in any potentially dangerous/hazardous operation/activity and such training shall be ongoing/periodic.

2.7 - OCCUPATIONAL H&S PRECAUTIONS

Particular attention should be given to the following at the place of work.

- a) The floor of the work place must have an even surface and be trip free.
- b) Sufficient space must be provided around machinery (Minimum 1mt. From extendable machinery parts) and between machinery/storage and walls, giving the workers room to move and carry out their ordinary duties without obstacle, and allowing for repair of their machinery and the transfer of items used at work.
- c) Passages are to be free from goods, holes, uncovered manholes, projecting nails, pipes, cables etc. or other installation, which could cause a hazard.
- d) Fire (emergency) exits/access, fire equipment and/or electrical panels/installations should not be obstructed by any means.
- e) Preventive/Corrective measures should be taken in areas/activities with potential occupational health risks. This could include (but not limit itself to), indoor air quality monitoring, noise monitoring, staff medical evaluations etc.

2.8 - INDOOR AIR QUALITY - OCCUPATIONAL HEALTH - EXPOSURE STANDARDS

For the maximum indoor concentration levels of gas, fumes, vapour or dust at any industrial operation, refer **Table 2 & 2A.**

- 2.10.1. Definitions: A purpose for establishing acceptable concentrations is to provide a basis for interpretations of the results of air analysis as an indication of the severity of potential exposure. Comparison of air analysis results with acceptable concentrations indicates either acceptable conditions or otherwise need, extent & urgency of control measures.
- 2.10.2. Sampling and analysis shall be performed by DM/ EHS-PCFC registered third party laboratories (See H,S &F Guidelines) to provide a reliable indication of potential exposure.

- 2.10.3. The "Acceptable concentrations" are the highest allowable concentration in the normal working atmosphere.
- 2.10.4. Employer/Lessee shall hold responsibility to maintain the required concentration levels as specified.
- 2.10.5 The Competent Department may require the Employer/Lessee to undertake studies by an approved Laboratory (see 2.10.2) periodically to ensure compliance with Regulations.
- 2.10.6 An occupier in control of any workplace covered by a code of practice or handling any substance for which an exposure standard is specified, shall comply with the technical and management directions stated therein.

2.9 - MEDICAL EXAMINATIONS - OCCUPATIONAL HEALTH

The employer shall arrange a medical examination of all workers engaged in manufacturing or allied activities, at the expense of the employer within 30 days of initial recruitment and every 12 months thereafter and maintain a register/record of these results at the place of employment. All medical examinations carried out for this purpose shall be conducted at the Ministry of Health/ Dubai Municipality clinic or any other clinic or hospital approved by the Competent Department. Special emphasis needs to be given to processes/activities that are hazardous and/or pose a potential threat to the health of workers (See Article 5). It remains the employer's responsibility to assess (in such cases, every 6 months) such potential health impacts and take all suitable measures to consistently record workers' health parameters during the period of employment and ensure that any identified problem is addressed immediately.

2.10 - ENFORCEMENT OF MEDICAL EXAMINATION REQUIREMENT

The Competent Department at any time, may direct any employer or occupier to conduct a medical examination of workers under his control, at a nominated government clinic or hospital, if, in the opinion of the Competent Department, their health may be at risk. The employer shall ensure that any medical evaluation described in is relevant to the nature of the risks of the job as advised by the Competent Department.

2.11 - WARNING SIGNS

Lessees must provide warning signs in all potentially dangerous areas, such as chemical/ gas cylinder storage areas, machinery, drills etc. Lessees must provide safety signs for protective clothing as per working hazard, such as "WEAR SAFETY GEAR" for noisy areas, "WEAR MASK" for dusty operational areas, in addition to other signs like "NO SMOKING", FLAMMABLE STORAGE AREA" etc.

2.12 – HOUSEKEEPING

Proper housekeeping and stacking of materials within the buildings/warehouses must be practiced. Areas outside pre-built warehouses, corridors between offices of leased buildings, open areas between plots of land and Authority property are not to be used for placement of equipment, materials, waste or other items. Open storage within a lessee premises is normally not advised, but where inevitable shall necessitate approvals from the Competent Department with due consideration for setback distances, Fire Protection,

emergency access/ egress, safety of vehicles/equipment and dust from vehicle movement areas. All such open storage grounds shall be hard surfaced and fenced/covered to maintain good aesthetics. Open areas within a lessee's premises shall not be used for storage/dumping of any wastes/unused materials which either pose an HS&E problem or affect aesthetics. Use of Shipping Containers for storage/industrial activities, office space and/ or Port Cabins within the premises is not permitted during the operations.

2.13 – FORK LIFTS, LIFTING EQUIPMENT

- a) Forklifts should be provided with reverse warning sound/buzzer. Rotating flashlight to be fitted while working in dark conditions or in crowded places.
- b) All lifting equipment including mobile cranes, Gantry Cranes, Crawler Cranes, Tower Cranes, EOT Cranes, Forklifts etc. must be tested/certified with a Load Certificate at suitable intervals (See Table 3) from an approved Agency by Dubai Accreditation Center and the Competent Department (See H,S &F Guidelines).
- c) A sign stating the maximum Safe Working Load capacity of the Lifting Equipment must be displayed on the EOT Crane, Jib Swing and Chain Block etc.
- d) Approval from the Competent Department is required for entry/use of Lifting Equipment into PCFC/EHS jurisdictional areas.
- e) All drivers /operators of such lifting equipment should have obtained the necessary licenses from the respective Police Department(s).

2.14 - LIFTING

An employee must not be asked to carry loads beyond his capability and in all cases the carried load must not be more than 20kgs.

2.15 - NOISE EXPOSURE

Noise Exposure – The maximum continuous exposure level is 85 dB (A) for 40-hour working week. For levels above 85 dB (A) the allowable exposure duration is reduced. (**Refer Table 4.**)

2.16 - ELECTRIC WELDING:

- a) A Work Permit should be issued by the Company/Lessee while carrying out any such works.
- b) A welding helmet/ welding visor in good condition is to be used. Ultraviolet radiation from 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 must be properly covered. The use of overalls and aprons is recommended.
- e) Ear protectors must be used by electric welders and gas torch operators while working in the overhead position or in other positions when welding bead can fall into the ear and cause severe injuries.
- f) Protective goggles must be used when knocking up slag etc.

- g) Live electrodes or electrode holders must 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.
- Welding equipment is to be checked for 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.
- I) Welding cable should 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 coiled when welding work is finished.
- o) Proper ventilation and welding fumes extraction system confined places and factory building should be provided as per Authority 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 at least 10 meters from the X-ray tube.
- q) Precautions are to be taken to prevent adjacent objects from catching fire due to welding operations.

2.17 -GAS WELDING AND GAS INSTALLATION:

- a) All gas cylinders should be treated carefully. Protective covers are to be fitted during storage and transport.
- b) Gas cylinders must not be subjected to impact and must not be placed in intense sunshine or close to any object radiating heat or fire.
- c) Gas cylinders are to be stored in shaded area, away from heat and ignition sources, placed upright and accessible from at least two sides.
- d) Oxygen and other gas cylinders should not be kept together, considerable distances of about 6 meters to be maintained if possible.
- e) Defective gas cylinders are to be marked "DEFECTIVE" and must be returned to the supplier as soon as possible.
- f) Oxygen cylinders and oxygen equipment must not be placed in oily locations and handled with oily hands or gloves.
- g) Valves on all gas cylinders must always be closed during pause in work, or on work completion.
 Valve covers are to be fitted when cylinders are not in use.
- h) Acetylene gas hoses are to be red, oxygen hoses are to be blue.
- i) Hoses and other equipment must not be hung on gas cylinders, values or other fixtures.
- j) Gas hoses must not be laid over hot steam boilers or steam pipes etc.
- befective gas hoses must not be used. The only permissible way join hoses are to use junction nipples.
- I) Gas cylinders are to be fitted with Flame Arresters & Flash Back fire valves.

- m) It is not permissible to use defective or damaged gauges on gas cylinders.
- No welding/cutting work is to be carried out on/near oil/gas/chemical installations, pipelines, tanks,
 drums etc. Defective sections must be dismantled and taken to a safe place for repairing.
- o) It is prohibited to manufacture acetylene gas by means of Calcium Carbide in a gas cylinder.
- p) Fire extinguishing equipment must always be available during welding/cutting work.
- q) Flammable/combustible substance/material must be kept at a safe distance from a welding/cutting hot work area.
- r) Approval from the Authority is required for transporting vehicle of gas cylinder/bulk gas to PCFC areas.
- s) The design, construction and installation of bulk gas storage tanks should meet relevant international standards such as NFPA, API, ASME or any other relevant current standards and prior approval from the PCFC should be obtained
- t) Adequate work permit procedure (hot work, cold work permit) should be implemented by the company management prior to commencement of any hot and cold works.
- u) All welding areas shall be provided with suitable extraction/filtration systems to dissipate welding fumes.

2.18 - VENTILATION :

- a) Adequate Local Ventilation (with filtration/mitigation arrangements where required) is to be arranged in connection with all types of works involving injurious or irritating gases/smoke/ fumes, which may occur or may form while the work is going on.
- b) Ventilation is to start up before work commences; a check is to be made by Foreman/Safety Officer.
- c) When welding and cutting work is being carried out in tanks and confined spaces, ventilation is to be arranged, preferably with both extraction and feed method with another person outside the tank as lifeguard.
- d) Gases which form in connection with painting of tanks etc. are generally heavier than air and for this reason extraction is to be arranged in the bottom of the tank.
- e) Spark free fan must be used while ventilating spaces where explosive gases occur.
- f) The ventilation and air-conditioning of any facility should be designed based on ASHRAE Guidelines or any other relevant international standards. However, the ventilation for the hazardous chemicals storage and other critical areas should be re-evaluated by the Competent Department or the registered Risk Assessment Consultants.

2.19 – LIGHTING

Employers shall provide adequate illumination in the work place to ensure the safe conduct of work. Minimum illumination intensities should not be below those specified in **Table 5**. Further, lights and light fittings should avoid dazzle and glare and be so positioned that they do not cause hazards. Moreover, where persons are particularly exposed to danger, in the event of failure or artificial lighting, emergency lights must be provided.

2.20 - RADIOACTIVE WORKS:

- a) Radioactive/Radiography work permit (on S3 Form) from EHS PCFC is required before carrying out radiography work involving radioactive material **(See H,S&F Guidelines)**.
- b) For import/export of any radioactive sources, License from Ministry of Energy (Radiation Control Section -RCS, Radiation Protection & Control Department -RPCD, Ministry of Energy. MoER, UNITED ARAB EMIRATES (UAE), P.O.Box 99979 DUBAI, Tel.: + 971 4 2945555 Ext. 310, Fax: + 971 4 2945005 shall be obtained by filling and submitting the relevant forms /details (See H,S&F Guidelines).
- c) For Importing, Exporting, Storage and handling of radioactive isotopes in the PCFC areas approval from the Authority is required (See H,S&F Guidelines). The current IAEA, local rules and regulations shall apply. For import of radioactive isotopes, S1 Form and for Export S2 Form should be filled and submitted to EHS.
- d) Monthly report for all import and export of Radioactive Isotopes from PCFC areas is to be submitted to EHS by 5th of each following month.

2.21 - ABRASIVE BLASTING :

Abrasive blasting has several Environment, Health & Safety implications and requirements (**See H,S&F Guidelines)** for the same should be adhered strictly. It should be noted that no open to air blasting shall be carried out under any circumstances and such uncontrolled activities shall invite serious action from the Authority (See Article 10 of Section 1). All measures shall be taken to protect workers, land and ambient air from any contamination due to this activity.

2.22 – PAINTING OPERATIONS

Painting Operations in Open air/atmosphere is strictly prohibited. Any requirement for painting (e.g. for large structures) outside designated paint booths/rooms/buildings shall necessitate requisite HS&E Controls and written approvals from the Competent Department on a case-to-case basis. Otherwise, all painting Activity should be carried out thus :

- Painting booth/room/building approved by the Competent Department (See H,S&F and DM-ET Guidelines)
- 2. Painting booth shall be substantially constructed of steel or other non-combustible material, securely and rigidly supported.
- 3. Designed to sweep air current towards the exhaust outlet.
- 4. Adequate storage areas for all paints and solvent should be provided.
- 5. All Electrical installation in the painting booth/storage area should be explosion proof category.
- 6. Adequate warning signs should be posted at all spraying areas and paints storage rooms.
- 7. All PPE related to painting shall be provided
- 8. All wastes from such operations shall be treated/recycled/reused as far as possible and any requirement for disposal shall be as per EHS/DM requirements.
- 9. Fire fighting equipment should be installed as per EHS Fire Department requirements.

10. Maximum 20 liters. of paint material should be stored in the painting booth area. More than 20 liters. of paint drums/material etc. should be stored outside the painting booth in proper Fire Proof Steel Cabinet or paint storage room designed/constructed with Fire Resistance material, spillage collection, Ventilation, Lighting and Fire detection/protection arrangement.

2.23 - BOILERS

Installation and operation of boilers/oil heaters etc. shall meet the Guidelines (See Table 6) of the Authority and no such equipment should be installed/operated without written approval from the Competent Department.

2.24 - ELECTRICAL EQUIPMENT

All Electrical installations shall be approved by the Authority prior to installation / operations. It shall remain the responsibility of the lessee/licensee/Consultant/Main contractor (where applicable) to obtain relevant approvals from DEWA for such installations.

2.25 - HAND TOOLS :

- a) Handles on hammers, sledgehammers, hand tools etc. are to be firmly in position before use.
- b) Electrical hand tools are to be connected only to appropriate safe-voltage outlets.
- c) It is urged/strongly recommended to use only 110 Voltage Power for such hand tools.

2.26- DANGEROUS OPERATIONS AND HAZARDOUS WORKS :

All dangerous operations such as deep excavations, confined space entry, higher elevation works, hot works etc should be controlled by proper work permit procedures and risk associated with such operations should be evaluated and accordingly proactive safety measures should be adopted by the Company management prior to commencement of any such operation.

2.27. - FIRST AID

- a) All premises must be provided with adequate first aid facilities with at least two trained first aiders during working hours.
- b) An employer must provide or ensure that there is provided, such equipment and facilities as are adequate and appropriate in the circumstances for enabling first aid to be rendered to his employees if they are injured or become ill at work.
- c) An employee must provide or ensure that there are an adequate and appropriate number of suitable persons for rendering first aid. A first aider is a person who has received training and who holds a current first aid certificate from an organization or employer whose training and qualification for first aiders are approved by authority. See **Table 7** for more details on First Aid Training.

2.28 - ACCIDENT/INCIDENTS AT WORKPLACE / CONSTRUCTION SITES

General Requirements

Accident Prevention measures should be given maximum importance which may be achieved by regular Risk Assessment, Safety Audits, medical screening etc. One should 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 accident/incident at the workplace needs to be addressed adequately by the occupier.

Responsibility

In operating companies/establishments that hire contracting companies/labour, the Management of such companies operating within the PCFC areas shall be responsible for ensuring the Health & Safety of the Contract Workers employed at their respective premises during their operations. Irrespective of whichever Contracting Company is involved, the concerned Management of companies operating within the PCFC areas shall also be accountable for any accident/incident that may involve the external company workers within the respective premises of the Company operating within the PCFC areas. It is hence recommended that contracts with such 3rd. parties include relevant clauses on HS&E Responsibilities. However, at construction sites, it remains the responsibility of the Main contractor to follow the provisions of this regulation.

Duty to Notify

The occupier/client/main contractor will ensure that the following types of accidents/incidents (including Fire incidents) are reported to EHS (Emergency Control Center) **immediately** by telephone on 04 8833111. This number is available 24 hours a day, 7 days a week. The types of accidents that require immediate notification are as follows:-

- A Fatality
- B Any fracture other than finger, thumbs or toes
- C Any amputation
- D Dislocation of the shoulder, hip, knee or spine
- E Loss of sight (temporary or permanent)
- F A chemical or hot metal burn to the body
- G Penetrating eye injury
- H Any injury resulting from an electric shock which causes unconsciousness
- I Any injury resulting from an electric shock which requires resuscitation
- J Any injury resulting from an electric shock which requires hospital admittance for more than 24 hours.
- K Any other injury that results in unconsciousness or the casualty needing resuscitation
- L Any injury resulting in the casualty being admitted to hospital for more than 24 hours
- M Any major injury suffered as a result of an accident arising out of or in connection with any work carried out in the premises
- N Any injury suffered by a person not at work (e.g. a visitor, customer, client, passenger,

by-stander) as a result of an accident arising out of or in connection with work where that person is taken from the accident site to hospital for treatment.

- O Any chemical/Gas/waste leak/discharge with a potential for HS&E Impacts
- P Accidents that include non-consensual physical acts of violence done to a person at work, suicide in/out of work.
- Q Occupational/Reportable/Infectious Diseases (See **Table 1** for Guidance)

The above injury conditions must also be reported to EHS in writing within 24 hours of the accident on the relevant **Accident/Incident Notification Form (See Table 8).** The completed form must be submitted to EHS and /or faxed to 04 8818857/8817023. It remains the responsibility of the Occupier/Owner/ Contractor to ensure that this form is received by EHS. Employers and employees are obliged under duty & law to disclose accident data to Safety representatives and Authorities.

Over 3 Day Injuries

In addition to the above, the occupier/main contractor must report all accidents where a worker is absent from work for more than 3 days, not including the day of the accident. The completed form must be completed and faxed to 04 8818857/8817023 or an alternative number provided by EHS on site, within 24 hours of the accident becoming reportable.

Investigation Of Accidents

All accidents should be investigated with a view to determining their cause and to determining the action that should be taken to prevent any similar accident in the future. The formality and depth of the investigation should be proportional to the severity or potential severity of the accident. The names of witnesses should be recorded and any relevant photographs taken should be identified, captioned and dated. The investigation should consider all the relevant evidence. This may include the site where the incident occurs, plant, the type of cargo 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 accident, but also to determine the *underlying* cause or causes, which are often the real cause of an accident.

Accident/Incident Records

The occupier of any workplace shall establish and maintain an accident/incident record system at the workplace and shall make this record available to EHS. This system shall contain the following information

- a. Nature of accident
- b. Description and cause
- c. Name/details of worker affected
- d. Treatment given
- e. Days of absence
- f. Corrective action taken

In addition, they must keep for a minimum of three years, records that should contain the following:

- a) Reportable deaths/injuries arising out of or in connection with work
- b) Reportable Occupational diseases
- c) Reportable dangerous occurrences
- d) Road accident/injuries arising out of or in connection with work
- e) Gas/chemical/environmental incidents

Sanctions & Penalties

Contravention of any of the provisions above is an offence. Inability by the owner/main contractor/occupier to ensure accident free operations shall also invite sanctions/penalties from the Authority, especially where it is established that adequate safeguards were not taken to prevent the accident/incident. The maximum penalty is a fine of AED Dh. 200,000/ as per current EHS Rules.

Compensation for Fatalities/ Work Injuries/Diseases

An employee who is the victim of an accident at work (Industrial accident) which results in total or partial disability will be eligible for financial compensation in accordance with current Legal/Administrative Rules of the respective Business Unit (NAKHEEL/JAFZA/Techno Park Rules etc.).

An employee who suffers from an occupational disease related to a particular activity or process as specified in **Table 1** will be eligible for financial compensation once he/she receives a written statement from the doctor who diagnoses the disease as an occupational disease that has resulted due to employee's duties. In case of a deceased person, it is required that the death certificate must include particulars as to whether death might have been due to, or contributed to by the deceased employment. Such particulars must be supplied by the doctor who attended the deceased, during the last illness.

2.29 - TRANSPORTATION OF GOODS/ MATERIAL

Before departing from the lessee's premises, the truck/trailer/pickup with general load/cargo, the lessee/licensee should ensure that all loads are well secured and lashed properly for traveling on the road. The Lessee/Licensee shall ensure that the vehicles used for such purposes and the drivers shall be suitably registered / licensed with the respective Police Department(s). Transportation of Dangerous Goods shall follow DM Code of Practice for Management of Dangerous Goods as well as Civil Defence Requirements and lessee/licensee/transporters shall ensure that suitable procedures are established and followed in the same regard. Only suitable vehicles shall be used for this purpose and drivers of such vehicles shall be specially trained on the requirements for transportation of dangerous goods.

2.30 -CHEMICALS & DANGEROUS GOODS

Chemicals are to be handled and stored very carefully. The employer /lessee shall be fully responsible for the Handling/storage and transportation of his Chemicals/dangerous Goods. Best International Practices shall be

followed for Management of Dangerous Goods, including mandatory Local/state regulations. All hazardous chemicals and substances must be stored in a protected /secured place with limited access. Chemicals handling, storage and Chemical Safety Data Sheets/manuals, supplied by the manufacturer or supplier, must be observed strictly. It is the responsibility of the lessees to obtain Material Safety Data Sheets, share them with the concerned employees and display them. The lessee shall maintain at all times records of dangerous goods used/stored/traded and shall regularly update records of the Competent Department on the same in the prescribed format. **(See H,S&F Guidelines)**.

No chemicals and/or dangerous goods are permitted for storage/handling without prior approval from the Competent Department. The storage area has to be approved by the Authority and accordingly a Risk Assessment (RA) study (See H,S&F Guidelines) has to be carried out by the client through an PCFC-EHS Registered consultant (See H,S&F Guidelines) prior to commencement of construction. The RA study requirements (including site suitability) shall need to be assessed by the Competent Department based on quantity and flammability/ toxicity/ hazardous nature of the chemicals/products. All Risk Assessment Studies shall assess relevant Environment, Health and Safety Risks associated with the project. No storage/handling of chemicals is permitted in the lessee premises unless specifically approved by the Competent Department. There shall be no open storage of any type of chemical in the lessee premises and any such storage/placement (unless specifically approved for a temporary period) shall be considered a serious violation of EHS requirements. Dangerous Goods are not permitted in Standard pre-built units.

Perfumery products, alcohol, tyres and other highly flammable products storage/manufacturing such as cigarette lighters etc should be stored in a controlled temperature and all the electrical fittings should be under classified category as per International standards. The fire protection requirements shall be as per PCFC-EHS : Fire Department requirements.

Dubai Municipality Code of Practice for Management of Dangerous Goods to be referred and adhered. It should be noted that from time to time various U.A.E. Government Departments issue Controlled and Prohibited Chemicals (See H,S&F Guidelines). It remains the responsibility of the lessee/trader to ensure that he does not deal with such substances without requisite approvals from the various Departments and/or EHS.

SECTION 3 PUBLIC HEALTH

3.1 - PROHIBITED DISPOSALS

It is prohibited to throw down, place, abandon or discharge any materials/wastes 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 not limit itself to) :

- a) All kinds of waste and/or unwanted materials such as garbage, waste paper, waste packing materials, cut pieces or metal or metal chips, grit or sandblasting waste, waste water, wash water including overflowing manholes, septic tank/soakaway and A/C condensed water.
- b) Anything which may hinder the free passage of vehicles and pedestrians or adversely the environment of PCFC areas or cause contamination or any other breach or threat to public health and safety.
- c) Throwing or disposing the cloths, plastics, papers cigarette tips etc in the sewerage line or drainage pipe line & appurtenances is strictly prohibited and doing so attracts penalty.
- d) Unauthorized disposal (without the approval/Permit of the Competent Department/DM).
- e) Waste generators who require to sell/recycle wastes/scrap materials shall ensure that third party recycling companies are approved by Dubai Municipality Environment Department.

3.2 – OIL/CHEMICAL/WASTEWATER DISCHARGES

It is prohibited to discharge waste oil or throw down any kind of unwanted or used /spent oils/chemicals or litter from any Industries/Factories, Establishments, Ship, Boat, Launch or any other craft into Drainage networks, Manholes, Storm water line/stream and Harbour. Any discharge of industrially generated wastewaters/ cooling waters/boiler discharges etc. into land/sewer/harbour shall be permitted only after obtaining a Permit from the Competent Department/DM. Contraventions shall invite sanctions/penalties as per EHS Rules.

3.3 - HAZARDOUS CHEMICALS

It is prohibited to dispose of chemicals or other hazardous chemicals like toxic waste; corrosive chemical waste or their empty cans into ordinary skips. Separate Special Waste Containers should be used for interim collection of such wastes prior to disposal/recycling. Prior approval must be taken from the Competent Department/DM before disposing of such waste. It remains the responsibility of the occupier/owner/licensee that generates the waste to ensure that approvals/permits are obtained from the Competent Department/DM for disposal of any wastes. Such waste generators who require to sell/recycle wastes/scrap materials shall ensure that third party recycling companies are approved by Dubai Municipality – Environment Department.

3.4 - DISPLAY OF GOODS

It is prohibited for any client to display, store or abandon goods, deposit waste, park containers/vehicles or carry out any sort of activity outside of their premises and they are to ensure that the footway fronting them is clear, clean and safe.

3.5 - LITTERING

Littering is an offence and shall be penalized.

3.6 - CLEANLINESS

It is the responsibility of the occupants/licensee to maintain good housekeeping, keep their area clean and tidy, including fences which must be free from flying waste such as polybags, papers etc.

3.7 – ADVERTISEMENTS

It is prohibited to fix any bill, notice, placards or other paper or means of advertisement upon any building, against any wall or places other than the places designated by PCFC.

3.8 – DISPOSAL OF LIGHT WASTE

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

3.9 – SKIP SERVICE

Permanent garbage skip placing area and Garbage Skip must be provided (within the plot limit only) for the disposal of domestic refuse and it should be cleared regularly. It remains the responsibility of the lessee to establish suitable contracts with the Service provider and ensure that advance notice is given to enable regular clearing of waste from skips. Adequate access to garbage skips should ensured to enable safe collection of wastes.

3.10 - SANITARY FACILITIES

Provision of sanitary facilities (Industrial/warehousing):

- a) Adequate sanitary facilities including water closets, wash hand basins with running hot and cold water, liquid soap dispenser and hand drying are to be provided in every premises conveniently placed in sufficient numbers and separate for each sex.
- b) Scale of provision of sanitary facilities:

Male :

Where no urinals are provided:

1WC and 1 wash basin for every 10 (Upto 100 men)

1WC and 1 wash basin for every 20 (Over 100 men)

Where urinals are provided (Upto 100 men):

1 WC for every 25

1 Urinal and 1 wash basin for every 10

Where urinals are provided (over 100 men):

1 WC for every 40

1 Urinal and 1 wash basin for every 20

Female:

1 WC and 1 wash basin for every 10 (up to 100 women)

1 WC and 1 wash basin for every 20 (Over100 women)

- c) Toilets; Toilet rooms should be well lit, ventilated to the external air and should have self-closing and tight-fitting doors. European type water closet apartments should always be provided with supply of toilet paper and Asiatic type water closet apartments should be fitted with water tap at approximately 1 foot from floor level on the user's left hand side. All toilet rooms and fixtures should be kept in good repair and in a sanitary condition.
- d) The use of common toilets in case both sexes are employed is strictly prohibited.
- e) In certain cases where the premises/plot is used for only open storage (without any regular employee presence), suitable sanitary facilities shall be provided on site (with the permission from the Competent Department) to cater to workers/drivers etc. during loading/unloading/stocking operations.
- f) Sanitary Facilities for other than Industrial, Warehouse & Factory Buildings shall be as per section 17 of Civil Engg. Department, "Building Regulations & Design Guidelines" Edition 2006.

3.11 - WALLS

- a) Mess, pantry and toilet walls to be tiled to a minimum height of 2.1 meters above floor level with glazed ceramic tiles and flooring with unglazed ceramic tiles.
- b) Adequate provision of Messing Room, Changing room with locker facility for the employees should be provided at each facility.

3.12 – DRINKING WATER

Clean & Safe Drinking water shall be provided with one point per 50 persons or as agreed with the Authority

3.13 – WATER TANKS

All potable fresh water tanks must be kept in good condition, cleaned and maintained regularly and properly as per EHS Requirements (See H,S&F Guidelines).

3.14 - WATER TAPS

All external water taps should also be fitted with proper drainage system.

3.15 - MESS HALLS

Eating facilities: There should be provision of mess hall with A.C. Ventilation, sitting and dining arrangement as per hygienic standards.

3.16 – A/C CONDENSED WATER

A/C condensed water and uncontaminated rain water drainage must be connected with suitable soakpit or drainage system.

3.17 – SEPTIC TANKS

For domestic waste, where there is no provision for drainage network, the lessee must provide suitable septic/holding tank and it should be maintained in proper conditions. Lessee should construct holding tank with level indicator and buzzer and should make arrangement for pumping out by tanker service on a regular basis to avoid any overflow.

3.18 – COLLECTION OF WASTE

All putrescent refuse must be collected in plastic dust bins with inner bags and covering lids before being disposed of in the skip. All non-hazardous waste shall be disposed in the skips/bins provided by the Service Providers and it shall remain the responsibility of the lessee to maintain such areas in a clean/safe manner. Collection/interim storage and disposal requirements of hazardous/industrial wastes shall be as advised by the Competent Department and suitable segregated areas should be provided for this purpose within the client's premises.

3.19 – PET ANIMALS

No pet animals, birds or live stock are allowed to be kept or fed in the area/premises without prior permission from the Competent Department.

3.20 – PREVENTION OF RODENTS

At points where pipe works/ vents/ services etc. pass into buildings, maximum care should be taken to ensure that rodents cannot gain access. It remains the responsibility of the Lessee/company to maintain regular contracts with service providers to prevent infestations.

3.21 – TERMITES CONTROL

Pre-construction termite treatment is strongly recommended for companies constructing their own buildings.

3.22 – PEST INFESTATIONS

It is the responsibility of all the companies to report to the Competent Department in case of any pest infestation. The lessee shall be responsible to take necessary preventive/corrective actions in this regard.

3.23 – AEROSOL AGENTS

Companies may not use any form of residual pesticide but may use aerosol/flushing agents, which are properly labeled. With the exceptions of domestic aerosol products, companies are not permitted to use any pesticides in the zone without first consulting the Competent Department.

3.24 – COMMERCIAL PEST CONTROL

Companies may not have the services of private pest control services without written permission from the Competent Department, except for Structural pest control (Termite treatment) & Pest Control to Marine Vessels (subject to EHS approval/procedures).

3.25 – FUMIGATION

All private companies who conduct fumigation in companies in the zone should obtain a No Objection Certificate from the Dubai Municipality Authority and a copy should be submitted to the Competent Department prior to the operation (at least 24 hours early).

3.26 – INFECTIONS

The company must immediately inform the Competent Department in case of outbreak of any infectious disease and food poisoning case.

3.27- PUBLIC NUISANCE

No activities shall be carried out by any lessee/licensee/occupier that shall cause a potential hazard or nuisance to his neighbours and/or public. Such instances could be of air pollution/emissions, noisy operations, improper storage, poor housekeeping, waste discharges, odourous 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 neighbours and public health.

SECTION 4

ELECTRICAL SAFETY REGULATIONS

4.1 WORKMANSHIP & MATERIAL

- a) Good workmanship and proper materials of internationally acceptable standards shall be used in all electrical installation.
- b) All material/equipment shall be so constructed, installed, protected and shall be capable of being maintained, inspected and tested, so as 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.
- d) The Power Factor of electrical loads shall be controlled such that the Power Factor, when the load is in operation, shall remain between 0.9 and 1.0 (lagging).

4.2 ELECTRICAL CONDUCTORS:

- 4.2.1 All conductors shall be of sufficient size and current carrying capacity for the purposes for which they are intended.
- 4.2.2 All conductors shall either-
- i) be so insulated, and where necessary, further effectively protected, or,
- ii) be so placed and safeguard as to prevent danger so far as reasonably practicable.
- 4.2.3. Every electrical joint and connection shall be of proper construction as regards conductance, insulation, mechanical strength and protection.

4.3 OVERCURRENT PROTECTIVE DEVICES.

- 4.3.1 Where necessary to prevent danger, every installation and every circuit thereof shall be protected against overcurrent.
- 4.3.2 The above protection shall be effected by devices which:

i) Will operate automatically at values of current which are suitably related to the safe current ratings of the circuit.

ii) Are of adequate current breaking/making capacity, and,

iii) Are suitably located and are constructed so as 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.

4.4 PRECAUTIONS AGAINST EARTH LEAKAGE AND EARTHFAULT CURRENTS:

4.4.1 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 should become defective or if a fault should occur in any equipment:

i) the metal work shall be earthed in such a manner as will cause discharge of electrical energy without danger, or

ii) other equally effective precautions shall be taken to prevent danger.

- 4.4.2 Every circuit shall be arranged so as to prevent the persistence of dangerous earth leakage currents by
 - i) the overcurrent protective devices mentioned at Sec.4.3 above, and,
 - ii) a residual current device or equally effective device.
- 4.4.3 Where necessary to prevent danger, where metal work of electrical equipment is earthed for compliance with section 4.4.1 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.

4.5 **POSITION OF PROTECTIVE DEVICES, SWITCHES AND ELECTRICAL EQUIPMENTS.**

- 4.5.1 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.
- 4.5.2 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.
- 4.5.3 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 danger.
- 4.5.4 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.
- 4.5.5 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.

4.6 - PRECAUTIONS IN ADVERSE CONDITIONS:

- 4.6.1 All equipments 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.
- 4.6.2 All equipments situated in surroundings susceptible to risk of fire or explosion shall be taken, as may be necessary to prevent danger.

4.7 - NATURE OF SUPPLY:

- 4.7.1 Following aspects of electrical power supply source shall be considered while designing electrical systems :
 - i) Nominal voltage
 - ii) Nature of current and frequency
 - iii) Prospective short circuit current at the origin of the installation

- iv) Type and rating of overcurrent protective device acting at origin of the installation
- v) Suitability of the source to meet requirements of installation including the maximum demand
- vi) The earth loop impedance of that part of the system external to the installation
- 4.7.2. Supplies for Safety and Standby Purposes : 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.

4.8 - INSTALLATION CIRCUIT ARRANGEMENTS

- 4.8.1 Every installation shall be divided into circuits as necessary to
 - i) Avoid danger and minimize inconvenience in the event of a fault
 - ii) Facilitate safe operation, inspection, testing and maintenance
- 4.8.2 Separate circuits shall be provided for parts of installation, which need to be controlled, in such a way that these circuits are not affected by failure of other circuits.
- 4.8.3 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 overcurrent protection, isolation, switching and the current carrying capacities of the conductors.

4.9 - ADDITIONS AND 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 is adequate for the altered circumstances and that the earthing arrangements are also adequate.

4.10 - FILTRATION DEVICE

Adequate Filtering/Smothering devices shall be introduced between incoming main supply and such electrical devices Arc Furnaces etc, which are likely to transmit harmful harmonic radiations, voltage spikes, or such other disturbances, back to the transmission/ distribution network.

4.11 – P.F CORRECTION

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

4.12 - INSPECTION AND 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 4.1 to 4.11 have been met.

4.13 - ELECTRICAL EQUIPMENT/INSTALLATIONS

- a) All Equipment/machinery and installations in industrial premises shall be approved by EHS prior to operations. It remains the responsibility of the lessee/licensee to ensure that all such installations are safe with all relevant approvals/certifications from DEWA prior to EHS approvals.
- b) Defective electric cables, apparatus, motors, fans, welding gears etc. must be rectified before work commences.
- c) It is forbidden to replace burnt-out fuses/ fit fuses which 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. must not be covered, but are to be protected so that they are not subjected to moisture, water, oil or steam.
- g) During 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 appropriate place to be done before undertaking any repair/maintenance work on electrical installations.
- i) Use of Generators in FZ Pre-built Unit Areas is not advised. Use of Generators in other areas shall need to be approved on a case-to-case basis by CED and EHS (See H,S&F Guidelines)
SECTION 5

HEALTH & SAFETY AT CONSTRUCTION SITES

5.1 DUTY OF CARE

5.1.1 General

All levels of management from director to site supervisor have a responsibility to ensure that those people working under their control are not exposed to unnecessary risk whilst they are at work. The 'duty of care' extends beyond what is legally required and covers the moral responsibility that all persons have to ensure others are not harmed by their acts or omissions.

5.1.2 Project Managers

Project Managers are ultimately responsible for safety on their project. They must ensure that adequate arrangements are in place to safeguard the health, safety and welfare of all persons under their control.

5.1.3 Duty of Care Responsibilities

Every person employed has the following responsibilities under the 'duty of care' that exists:-

- 1. To safeguard their own health, safety and welfare.
- 2. To ensure that others are not exposed to unnecessary risk by their acts or omissions.
- 3. To lead by example
- 4. To stop unsafe working practices or report unsafe working practices to their manager.

5.1.4 Training

All employees shall be briefed on the duty of care that exists in the form of inductions, toolbox talks and management safety briefings. The Project Manager is responsible for ensuring that adequate arrangements and resources are in place for training to be carried out.

5.2 RISK ASSESSMENTS

5.2.1 General Requirements

Every main contractor must ensure that risk assessments are undertaken for all work activities that present a risk to the health and safety of employees and others who may be affected by their undertaking. All risk assessments must be recorded and a register of risk assessments must be held in the main contractors project office. EHS will review risk assessments as part of their COC I and II inspections and any contractor failing to undertake risk assessments will not be issued with the appropriate COC.

5.2.2 Communication of Risk Assessment Information

The main contractor must ensure that the information contained in the risk assessments is communicated in a comprehensible way to the workforce. This communication will normally be in the form of inductions,

toolbox talks or worker safety briefings but in any case the information must be passed to the workers before they start work. In the case of inductions the Main Contractor will be responsible for ensuring that every worker (including the workers of subcontractors) is inducted in the health and safety requirements of the project.

5.2.3 Review Of Risk Assessments

The main contractor will ensure that risk assessments are regularly reviewed and kept up to date as new processes are adopted or when changes in the method of work present additional risks.

5.2.4 Five Steps To Risk Assessment

The following 5 steps to risk assessment are internationally recognized as the procedure to follow when undertaking risk assessments:-

- 1. Step 1. Look for the hazards
- 2. Step 2. Decide who might be harmed.
- 3. Step 3 Evaluate the risks and decide whether the existing precautions are adequate or whether more should be done.
- 4. Step 4 Record your findings
- 5. Review your risk assessment on a regular basis and revise it if necessary

The main contractor must ensure that they have a written procedure to cover the identification of hazards and assessment of risk. All risk assessments must be signed and dated by the person undertaking the assessment.

5.3 CERTIFICATES OF CONFORMITY (COC)

5.3.1 General Requirements

The main contractor will ensure that prior to the commencement of any project a Certificate Of Conformity (COC) Stage 1 form is completed and submitted to EHS main office along with a security deposit. In turn EHS will inspect the site and review the necessary site health and safety documentation as listed on the COC Stage 1 form. If all requirements are successfully complied with EHS will approve the COC Stage 1 and notify the main contractor in writing of this. The main contractor must make application for a COC Stage 2 when the height of the building reaches 4 metres by following the same procedure.

5.3.2 Compliance With EHS Rules And Regulations

The main contractor should take note that by signing the COC Stage 1 and 2 forms he confirms that he will undertake construction work in accordance with PCFC/EHS/DM regulations and guidelines. The main contractor also assumes full responsibility for all activities on his site that he can reasonably be expected to control.

5.3.3 Financial Penalties

The main contractor accepts that by signing the COC Stage 1 and 2 forms he is liable for all financial penalties that may be imposed on him as a result of him failing to comply with PCFC/EHS/DM regulations and guidelines.

5.4 HEALTH AND SAFETY PLANS

5.4.1 General Requirements

The main contractor must ensure that prior to the commencement of any project a Health And Safety Plan is prepared which covers the specific requirements of the project. The Health And Safety Plan will be reviewed by EHS as part of the COC Stage 1 application (See H,S&F Guidelines).

5.4.2 Health And Safety Plan Requirements

As a minimum the main contractor must ensure that the Health And Safety Plan that he prepares covers the following elements:-

- 1. Project scope of works
- 2. Roles and responsibilities of key project staff
- 3. Appointments of key staff given health and safety responsibilities
- 4. Register of project risks identifying risk owner and schedule of submittal of risk assessments
- 5. Risk assessments to cover current and immediate future activities
- 6. Health and safety inspection and audit plan
- 7. Project logistics plan
- 8. First aid arrangements
- 9. Accident reporting procedure that complies with EHS reporting requirements
- 10. Emergency procedure for the project covering foreseeable emergencies
- 11. Details of fire arrangements
- 12. Details of health and safety meetings that will be held and their frequency
- 13. Environmental protection plan (refer to PCFC Environmental Protection Regulations)
- 14. Safety Management System procedures that will be implemented on the project.
- 15. Crane plan and details of lifting operations (where applicable)

The main contractor will ensure that the Health And Safety Plan remains a live document and is reviewed and where necessary revised on a regular basis.

5.5 WORK AT HEIGHTS

5.5.1 Definition Of Work At Heights

Work that can not be done from the ground or is next to an open excavation/pit and all work where there is a risk of a fall liable to cause any injury means, "**Working at height**". Falls from height account for a high percentage of fatalities and major injuries in the construction industry.

5.5.2 Risk Assessment

The main contractor must carry out a risk assessment for all works that are carried out at height where there is a risk of people or materials/objects falling. The following hierarchy of control measures must be followed when carry out the risk assessment:-

- 1. Eliminate the need for work at height to be carried out
- 2. Give priority to collective protective measures such as guardrails and toe boards
- 3. Use personal suspension equipment such as mobile elevating work platforms
- 4. Use proximity restraints to prevent access to the edge where a fall could occur
- 5. Use personal protective equipment such as a safety harness to mitigate the consequences of a fall
- 6. Use safety nets to reduce the fall but ensure nets are fitted as close as possible to the working level to minimize the fall distance

The main contractor must ensure that all personnel working at height are briefed on the risk assessment and method statement for the work and are fully aware of the control measures that must be in place.

5.5.3 Working Platforms

The main contractor must ensure that where work at height is carried out a safe working platform is provided where this is reasonably practicable to achieve. The working platform must be provided with safe access and egress which should be in the form of stairs or ladders where vertical travel is required.

5.5.4 Areas Of Work

The main contractor is to ensure that the place where any work at height is to be carried out, including the access to the place of work has features to prevent a fall including but not limited to guardrails, toe boards, safety nets, personal fall arrest systems, life lines or hole coverings. All reasonably practicable precautions must be taken to prevent anyone or anything from falling.

5.5.5 Training Requirements

The main contractor is to ensure all those working at height are competent and understand the risks involved. Training will include but not be limited to; pre job briefings, tool box talks, correct use and maintenance of personal fall arrest systems, life lines and how to avoid falls.

5.5.6 Inspections

The main contractor is to ensure that all areas and equipment for the purpose of working at height are inspected by a qualified and competent person based on the type of work platform or equipment in use. Inspections are to be carried out in accordance with manufacturer's instructions and after adverse weather conditions

5.5.7 Weather Conditions

The main contractor is to ensure that work at height is stopped in adverse weather conditions that may endanger the health and safety of those employed.

5.5.8 Housekeeping

The main contractor is to ensure materials are stored correctly and rubbish is not to accumulate in areas where work at height is carried out. Tipping or throwing, rubbish or materials from height is strictly prohibited. The main contractor must make arrangements for a rubbish chute to be provided to facilitate the removal of rubbish from a height.

5.5.9 Falling objects

The main contractor is to ensure that all precautions are taken to prevent objects from falling and any person from being struck by falling objects, including but not limited to, exclusion area, debris fans or brick guards/nets. Two tier working is prohibited.

5.5.10 Emergency Arrangements

The main contractor will ensure that an emergency procedure is developed and implemented to deal with emergencies that may arise when work at height is being carried out. This will include, but not be limited to, dealing with the rescue of any person who may become suspended by their safety harness or any person who may become suspended in a safety net. In the case of a worker who may become suspended by their safety harness following a fall the procedure should allow for the rescue of the worker in 10 minutes or less as far as is practicable. The main contractor should carry out rescue drills frequently to test the effectiveness of the emergency procedure.

5.6 STEEL ERECTION AND ROOF WORKS

5.6.1 General Requirements For Steel Erection

The main contractor is to ensure that the following points are complied with where applicable:-

- 1. Ensure the erection work is sequenced so that stairs and handrails can go in as early as possible to provide safe access to high levels of the structures.
- 2. Adding bracing into the design to ensure integral stability of the structure through all stages of erection.
- 3. Designing connection joints to make bolting up easy.
- 4. Ensuring adequate information is passed on to alert erectors about special sequences which need to be followed to ensure stability.
- 5. Steel beam walking, climbing or traversing is strictly prohibited where there is a risk of workers falling in excess of 2 metres.

5.6.2 Risk Assessment

The main contractor must undertake a risk assessment for steel erection work which should include but not be limited to covering the following points:-

- 1. Falls when working at height.
- 2. Erectors being hit or knocked off the steel by moving steel members or decking packs being craned into position.
- 3. The structure collapsing before it is fully braced.
- 4. Materials dropping onto people working below.
- 5. The manual lifting of heavy steel members, causing back and other strains injuries.
- 6. Crane safety to ensure the correct crane capacity to prevent incidents such as the crane failing or overturning.

5.6.3 Roof Deck Construction

The man contractor is to ensure that roof deck construction work is carried out safely taking into account the specific hazards of the work. Where the roof deck design allows the positioning of decking sheets should be carried out from below using either mobile scaffolding or Mobile Elevating Work Platforms (MEWPS). Where this is not possible a safe system of work must be developed following the hierarchy of control measures outlined in section 5.5.2 of these regulations. Particular attention must be given to the leading edge of the roof deck construction where the main contractor must prepare a detailed health and safety method statement covering how the work is to be carried out safely.

5.6.4 Work On Fragile Roofs

A fragile roof is defined as any roof material through which a person could fall, it may include but is not limited to the following materials; asbestos cement, fiberglass, corrugated metal sheet, plastic or composite materials. The main contractor will undertake a survey of the roof and prepare a risk assessment prior to any work being carried out on the roof. The risk assessment must identify if the roof sheet material could be classed as fragile taking into account the material and the possible effects of material deterioration over time. Where there is a risk of the roof material being fragile the main contractor must ensure the following:-

- 1. All workers must be briefed on the hazards of the work and the control measures that must be followed. Where possible experienced workers should be selected.
- 2. Purpose made roof ladders and crawling boards must be used.
- 3. Roof lights should be covered with a suitable covering or barriered off to prevent workers falling through them.
- 4. Section 5.5 of these regulation must be followed where workers are working at height

5.7 EMERGENCY ARRANGEMENTS

5.7.1 General Requirements

The main contractor is to ensure all emergency arrangements and procedures are in place and drills are carried out at least twice a year to test the system. Records will be kept of all drills and real emergencies. All procedures must be clearly posted on the safety notice boards around the site e.g. offices, welfare areas, site entrance and building access points.

5.7.2 Emergency Plans

The main contractor will prepare an emergency plan to cover foreseeable emergency situations. This will include but not be limited to procedures for the following:-

- a. Fire emergencies
- b. Medical and health emergencies
- c. Accidents
- d. Serious incidents to be defined in the emergency plan
- e. Project/Area evacuation
- f. Night working emergency response

The emergency plan prepared by the main contractor will clearly identify the roles and responsibilities of key personnel involved in the emergency procedure. The main contractor 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.

5.7.3 Muster Points

The main contractor will ensure that there are a minimum of 2 muster points designated at each work site which are clearly identified. The location of the muster points should take into account prevailing wind direction; in the event of smoke contaminating one muster point the other would be used.

5.7.4 Training

The main contractor is to ensure all those working on site are trained in and understand the emergency procedures. The emergency procedures must initially be communicated to all personnel during the site induction but regular reminders are to be given in the form of toolbox talks.

5.8 HEALTH AND SAFETY INSPECTIONS

5.8.1 General Requirements

The main contractor is to ensure that regular health and safety inspection are undertaken by the safety advisor(s) of all work areas including site offices and worker accommodation camps. As a minimum health and safety inspections are to be undertaken weekly and a full and detailed inspection report identifying non compliances is to be prepared. Where the main contractor has many buildings a sufficient number of inspections must be undertaken to ensure the whole site is inspected.

5.8.2 Non Compliance Close Out

The main contractor's project manager is responsible for ensuring that arrangements are in place to close out all non compliances raised in the health and safety inspection reports prepared by his safety advisor(s). The project manager must ensure that all managers, engineers and supervisors under his control take the necessary corrective/preventative action to close out non compliances.

5.8.3 EHS : Health And Safety Inspections

EHS will undertake periodic inspections of the main contractors work areas and review project health and safety documentation. The main contractor will allow for a senior manager to accompany EHS on their inspections. A written health and safety inspection report will be prepared by the EHS inspector raising any non compliances identified during the inspection. In addition the necessary action and timescale for completion will be recorded on the report. The main contractor is responsible for ensuring that the action is taken within the agreed timescale.

5.8.4 Failure to Take Action

Should the main contractor consistently fail to rectify the non compliances raised in the inspection report a warning letter will be sent to him advising him that he has 7 days to take the necessary action. Should the main contractor continue to fail to rectify the non compliances then EHS reserve the right to issue a financial penalty commensurate with the seriousness of the non compliances without further notice.

5.9 SCAFFOLDING

5.9.1 General Requirements

All scaffolding will be erected by competent scaffolders to the standards outlined in the Dubai Municipality Code Of Construction Safety Practice. All scaffolding must be fit for purpose and lightweight scaffolding is to be used only up to a maximum height of 10 metres and only where no materials are loaded onto the working platforms. As a minimum scaffolders employed by the main contractor must be assessed as competent by an organisation approved by EHS and pass a practical test at the end of the course. All scaffolders must be clearly identifiable and the wording 'SCAFFOLDER' must be clearly printed on their coveralls. The main contractor must appoint a suitably experienced 'Scaffolding Supervisor' who will be assessed and certified by a training organisation approved by EHS. The main contractor will only be permitted to erect scaffolding where the total height of the scaffold to the working platform does not exceed 10 metres. **This regulation will become mandatory 3 months from the date that these regulations come into force.**

5.9.2 Design of Scaffolding

A competent scaffold designer must be employed by the main contractor for all scaffolding that is to be erected over a height of 10 metres. EHS reserve the right to insist that the main contractor calls upon the

services of the scaffold designer to inspect scaffolding to ensure the design requirements are fully complied with.

5.9.3 Erection of Scaffolds Over 10 Metres

The main contractor is to make arrangements for an independent scaffolding contractor to carry out all scaffolding works where the total height of the scaffold to the working platform exceeds 10 metres. Before the main contractor enters into any contractual arrangement with a proposed scaffolding contractor the main contractor must demonstrate to EHS that the selected scaffolding contractor is competent to undertake the work. The measure of competency shall be based on the following:-

- 1. Training of scaffolders to an internationally recognized standard
- 2. Experience of the scaffold contractor
- 3. Competency of the scaffold contractors supervision to an advanced level of scaffolding
- 4. Suitability of the scaffold components to meet the requirements of the scaffolding

In the event of the main contractor not being able to satisfy EHS on the competency of the proposed scaffolding contractor, EHS reserves the right to reject the scaffolding contractor. Where any main contractors feels he possesses the necessary competency to erect scaffolding in excess of 10 metres he should provide EHS with full details to meet points 1 – 4 above. Where a main contractor can demonstrate that they possess the necessary level of competency to erect scaffolding over 10 metres high an exemption certificate will be given in writing to this regulation by EHS on a project by project basis. EHS reserve the right to terminate this exemption certificate following a written final warning to the main contractor in the event of poor safety standards. This regulation will become mandatory for all new main contractors appointed by Nakheel or by a 3rd party developer working on projects under PCFC jurisdiction 3 months from the date that these regulations come into force.

5.9.4 Prevention of Falling Materials and Objects

In addition to the requirements to provide toe boards the main contractor must ensure that adequate measures are taken to prevent materials falling. A risk assessment must be undertaken for works on scaffolding and where there is a risk of objects / materials falling brick guards or other similar protection must be provided.

6.9.5 Inspection Of Scaffolding

The main contractor must ensure that a competent person undertakes an inspection of all scaffolding before it is used by workers. The scaffold inspector must either be the 'Scaffold Supervisor' or a member of the site team who has received training on scaffold inspection by an organisation approved by EHS. The inspection must be recorded in a scaffold register which must be kept on site. The inspection must be repeated at least every 7 days and also following any alteration of the scaffolding. Scaffolding must also be inspected by a competent person after any event that may effect it's safety, this will include but not be limited to bad weather conditions.

5.9.6 Tagging Of Scaffolds

Every scaffold will be provided with a simple colour coded tag to identify if it is safe to use the scaffolding. The tag must be provided adjacent to the access point to the scaffold. The colour tag used for safe scaffolding will be Green and for unsafe scaffolding Red. The tagging system chosen by the main contractor shall meet the requirements of the internationally recognized Scafftag® system. The main contractor will ensure that all workers under their control are familiar with the tag system and understand that Red tagged scaffolds are not to be used.

5.9.7 Safe Place of Work

The main contractor will ensure to the best of their ability that every scaffold platform is safe to work from. There must be safe access to and egress from every scaffold. The main contractor must ensure that scaffolding is properly maintained in order to provide a safe place of work. Subsequent to rain or heavy wind, the Scaffolding Supervisor shall inspect all scaffolding and staging prior to work re-commencing.

5.9.8 Requirements for Scaffold Towers

The main contractor is to ensure that all scaffold towers are erected by trained and experienced workers. The maximum height of any scaffold tower without outriggers will be three and a half times its shortest base measurement. The main contractor will ensure that suitable safe access is provided to and from any scaffold tower. Under no circumstances will workers be permitted to climb the scaffold tower frame in order to gain access to the working platform. Guardrails and toe boards must be fitted to tower scaffolds where workers could fall 2.0 metres or more in accordance with the Dubai Municipality Code of Construction Safety Practice.

5.9.9 Use of Safety Harnesses

The main contractor will ensure that all scaffolders working where they could fall 4 metres or more are provided with and use a full body harness along with a shock absorbing lanyard. Workers using full body harnesses must be trained in the safe use of the harness and the main contractor must make arrangements to ensure the recovery of any worker who may become suspended by his harness following a fall. The use of safety belts by scaffolders is strictly forbidden.

5.9.10 Safe Place Safe Person Strategy

The main contractor will give priority to protective measures that protect the whole workforce as in the case of guardrails and a safe working platform. Harnesses will only be used when it is not possible to provide guardrails and a safe working platform as in the case of erecting scaffolding.

5.10 ACCIDENT REPORTING (See also Section 2.28)

5.10.1 General Requirements

The main contractor will ensure that the following types of injuries are reported to EHS **immediately** by telephone on 04 8833111 or any other means. This number is available 24 hours a day 7 days a week. The types of accidents (indicative) that require immediate notification are as follows:-

- A Fatality
- B Any fracture other than finger, thumbs or toes
- c Any amputation
- d Dislocation of the shoulder, hip, knee or spine
- e Loss of sight (temporary or permanent)
- f A chemical or hot metal burn to the eye
- g Penetrating eye injury
- h Any injury resulting from an electric shock which causes unconsciousness
- i Any injury resulting from an electric shock which requires resuscitation
- j Any injury resulting from an electric shock which requires hospital admittance for more than 24 hours.
- k Any other injury that results in unconsciousness or the casualty needing resuscitation
- I Any injury resulting in the casualty being admitted to hospital for more than 24 hours

The above injury conditions must be reported to EHS in writing within 24 hours of the accident on the Accident Notification Form (See Table 8). The completed form must be submitted to EHS and /or faxed to 04 8813105. It remains the responsibility of the Contractor to ensure that this form is received by EHS.

5.10.2 Over 3 Day Injuries

The main contractor must report all accidents where a worker is absent from work for more than 3 days, not including the day of the accident, on the Accident Notification Form **(See Table 8)**. The completed form must be completed and faxed to 04 8813105 or an alternative number provided by EHS on site, within 24 hours of the accident becoming reportable.

5.10.3 Reportable Diseases

The main contractor and /or medical practitioner must ensure that any occupational diseases as specified in **Table 1** or infectious diseases are reported to EHS within 24 hours of the condition becoming medically diagnosed. The reportable occupational disease must be reported to EHS in writing and faxed to 04 8813105.

5.11 WELFARE

5.11.1 General Requirements

The main contractor is responsible for ensuring the welfare of all workers under his control. As a minimum the main contractor must ensure adequate welfare facilities as detailed in Dubai Municipality Code Of

Construction Safety Practice. The main contractor must make arrangements to ensure that the facilities provided are properly maintained and cleaned on at least a daily basis.

5.11.2 Drinking Water

The main contractor must ensure that there is an adequate supply of drinking water supplied close to the work site. During the summer months this supply of water must be chilled. During the period 15^{th} June – 15^{th} September the main contractor must also ensure that ISOTONIC solutions are provided to the workforce in order to prevent dehydration. The use of salt tablets is prohibited.

5.12 PERMIT TO WORK PROCEDURES

5.12.1 General Requirements

The main contractor must ensure that a permit to work procedure is in place for high risk activities including but not limited to; hot works, excavations, work on electrical systems, diving, confined spaces and live fire alarm systems.

5.12.2 Appointment of Competent Person

The main contractor must appoint a competent person as the permit to work coordinator who shall have the responsibility to oversee the permit to work procedure. The need for a permit will be identified in the risk assessment for the activity and all persons working under the control of the main contractor who will be affected by the permit to work procedure must be fully briefed on the arrangements.

5.12.3 Registers

The main contractor will ensure that a register is maintained for all permits to work which must be available for inspection. A permit is valid for the duration of a shift or until the work is complete, whichever is sooner. Upon completion of work or at the end of the shift the permit must be closed out and signed off by the supervisor in charge of the work.

5.12.4 Audit of Permit to Work Procedures

The main contractor will make arrangements to audit the permit to work procedure to ensure the level of control imposed by the permit is maintained.

5.13 ELECTRICAL SAFETY

5.13.1 General

This regulation covers the safety of temporary electrical installations on construction projects as well as the use of electrical tools and equipment. The main contractor is responsible for ensuring the safety of all temporary electrical installations and for ensuring the risks associated with using electrical tools and equipment are kept as low as possible.

5.13.2 Competency of Electricians

All persons employed as electricians must be competent and be in possession of a recognized electrical qualification. The main contractor must ensure that any persons working on electrical installations including temporary electrics are competent.

5.13.3 Testing Of Temporary Electrical Installations

The main contractor is to ensure that all temporary electrical installations are tested by a competent electrician and that a certificate is issued for each distribution board. A copy of the certificate shall be held in a plastic wallet and fixed to the distribution board so that it is easily available for inspection. All temporary electrical installations must be earthed and the resistance of the earthing must be checked to ensure it meets the level required under electrical safety guidelines from the generator manufacturer or DEWA in the case of mains supply. In the absence of any guidance from the generator manufacturer the earth rod shall be driven to a depth so that it penetrates the summer water table by 2 metres and the resistance of any point in the earth continuity system does not exceed 0.5 ohms.

5.13.4 Use of Reduced Voltage Electrical Tools and Equipment

The main contractor is to ensure that all electrical hand tools and machinery such as circular saws operate at 110v through a step down transformer. All 110v leads connected to the transformer and run across site are to be Yellow in colour. The only exception allowed will be where certain tools or machinery are not available in the reduced voltage. In this case where 230v or greater are used a Residual Current Device (RCD) must be fitted with a 30mA trip. The requirement for the use of 110v shall also extend to temporary lighting. **This regulation will become mandatory 6 months from the date that these regulations come into force.**

5.13.5 Security of Electrical Installations

The main contractor must ensure that all electrical installations are secured. Distribution boards must be locked shut and under no circumstances shall live conductors be exposed where workers could accidentally come into contact with them. Clear warning signage must be displayed on all electrical installations and only competent electricians are to have access to distribution boards.

5.13.6 Protection of Electrical Cable

The main contractor must ensure that all electrical cables running from a generator to the distribution board are mechanically protected. The preferred method will be the use of steel wire armored (SWA) cable to ensure that the risk of electric shock from cable damage is greatly reduced. All connections in cables are to be made by a competent electrician and with proprietary connectors under no circumstances are joints to be made using solely electrical tape.

5.13.7 Electrical Connections

The main contractor is to ensure that all electrical connections are made using plugs and sockets that meet the requirements of BS4343. These connections should be either the waterproof or splash proof design under no circumstances are domestic 2 or 3 pin plugs or sockets to be used. It is strictly prohibited for bare electrical cable ends to be pushed into electrical sockets in order to make a circuit.

5.14 WORK IN EXCAVATIONS

5.14.1 General Requirements

The main contractor will undertake a risk assessment for all excavation work where the depth of the excavation exceeds 1.2 metres. A trained and suitably experienced person must advise on the measures to be taken to ensure work in the excavation can be carried out safely. The preferred method to prevent the collapse of the excavation sides is battering or stepping the edges to an angle that is safe for the ground conditions. On deep excavations – greater than 2.0 metres – an engineer must advise on the necessary angle of repose for excavations with battered sides. Where it is not possible to batter or step the sides of the excavation physical supports should be provided in accordance with an engineers requirements.

5.14.2 Inspection of Excavations

The main contractor is to ensure that a suitably trained and experienced person regularly (at least once per shift) inspects the sides of excavations to ensure the safety of the workers. Where temporary supports are installed in an excavation these must be inspected daily by a competent person and a record of a thorough inspection must be made each week in an excavation register. The inspection must be carried out before workers are allowed to work in the excavation. Where there is concern over the result of an inspection work must not be allowed to start in the excavation until the excavation is made safe. All excavations shall be inspected subsequent to any rains and subsequent to the ingress of water from other sources. Where the water entering the excavation appears to be ground water, work shall cease immediately until the excavation is danger free.

5.14.3 Access to the Excavation

The main contractor must ensure that there is safe access provided to the excavation. This will normally be in the form of ladder access and the ladder must be secured or fixed in some way to prevent it from being displaced. Under no circumstances are any workers to be allowed to climb on excavation support work or try to climb down the steep sides of the excavation.

5.14.4 Prevention of fall into Excavations

The main contractor must ensure that the work around the top of the excavation can be carried out safely. Guardrails and toe boards must be fitted in accordance with the Dubai Municipality Code Of Construction Safety Practice. Adequate steps must be taken to ensure that materials or objects are prevented from falling into the excavation. These steps could include but not be limited to providing debris netting or plastic sheeting around the top of the excavation fitted to the guardrails.

5.14.5 Vehicle Safety

Where possible the main contractor is to organize his work to ensure that vehicles and traffic are prevented from coming close to excavations. Where vehicles have to come close to open excavations for example when taking spoil away there must be baulk timbering provided to prevent the vehicle overrunning into the excavation. A trained and experienced person must advise the main contractor on the distance that vehicles can come to the edge of the excavation without compromising the safety of the excavation or those working in the excavation.

5.14.6 Dangerous Atmospheres

The main contractor must ensure the safety of those in excavations and as part of the risk assessment process must take into account the risks associated with dangerous atmospheres. Where there is a risk of a dangerous atmosphere the main contractor must identify appropriate control measures in the risk assessment and ensure the necessary action is taken. The type of dangerous atmospheres that must be considered include but are not limited to the following:-

- 1. Oxygen Deficiency
- 2. Oxygen enrichment
- 3. Presence of harmful gases such as Hydrogen Sulfide or Carbon Monoxide from vehicles.
- 4. Flammable/explosive atmospheres resulting from a process/activity carried out in the excavation.

Where there is a risk of a dangerous atmosphere the main contractor must take all necessary steps to ensure the safety of the workers engaged in the excavation. The main contractor must ensure that the findings of the risk assessment and information on the control measures are passed to the workers. Where there is a specific training requirement as in the example of escape set breathing apparatus the main contractor must make arrangements for this training to be provided to the workers.

5.15 SAFETY ADVISORS/OFFICERS

5.15.1 General Requirements

Every main contractor must ensure that an adequate number of Safety Advisors/Officers are employed and resident on site. As a minimum 1 resident safety advisor must be employed when the main contractor or his subcontractors have 150 workers under his control. Further resident safety advisors must be employed for every 350 workers under the control of the main contractor thereafter. The main contractor must also make arrangements to ensure that an adequate number of resident safety advisors are available to cover the night shift.

5.15.2 Registration Of Safety Advisors

All safety advisors employed by the main contractor must be registered with EHS and approved. As part of this registration process all safety advisors will be required to attend a 2 day safety advisors training course that will be run by EHS and Nakheel. At the end of the second day a written examination must be successfully completed in order for the safety advisor to be approved. Once approved the safety advisor will be issued with a registration card that will be valid for a period of 2 years after which time the safety advisor must attend a 1 day refresher course in order to renew his registration with EHS.

5.15.3 Roles And Responsibilities Of The Safety Advisor

The safety advisor <u>is not</u> responsible for the management of safety on the project, This responsibility rests with the main contractor's Project Manager. The safety advisor will have the following responsibilities:-

- 1. Provide advice to the main contractor on health, safety and environmental issues.
- 2. Monitor statutory compliance by carrying out regular inspections and auditing the main contractor's works.
- 3. Undertake at least a weekly inspection and prepare a quantitative report for submittal to the main contractor's Project Manager.
- 4. Report immediately to the main contractor's senior management any serious safety breaches that place workers in life threatening situations.
- 5. Assist the main contractor in undertaking risk assessments and identifying safe systems of work to be recorded in safe work method statements.
- 6. Develop and deliver in house training courses on health, safety and environmental topics.
- 7. Assist supervisors in delivering toolbox talks to the workers on the control measures identified in risk assessments and the safe system of work to be adhered to.
- 8. Develop and deliver the worker induction ensuring that all workers receive an induction prior to starting work.
- Develop procedures for high risk activities and brief management on their responsibilities under these procedures. Audit against these procedures regularly and report any non compliances to the Project Manager.
- 10. Ensure that the main contractor has an accident investigation reporting procedure in line with EHS requirements.
- 11. Undertake the lead role in all accident investigations and ensure that a written investigation report is provided to EHS for all reportable accidents.
- 12. Audit the registers which should be maintained by the Plant Manager for lifting equipment and lifting accessories.
- 13. Advise on the requirements for site welfare and carry out regular inspections of the facilities, reporting any concerns to the main contractor's Project Manager.
- 14. Conduct himself professionally at all times and ensure that the advice he gives his employer is to the best of his ability.

5.16 CONFINED SPACES

5.16.1 General Requirements

A confined space is to be defined as "any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, and flue, well or other similar space in which by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk. These specified risks are the presence of any of the following conditions or a risk of any of these conditions arising:- oxygen enrichment, oxygen deficiency, presence of a toxic gas, fume or vapour, ingress of liquid, solid materials that can flow and excessive heat." The main contractor must take all necessary precautions to ensure the safety of any worker employed in confined space working.

5.16.2 Risk Assessment

The main contractor must undertake a full and detailed risk assessment prior to any work commencing in a confined space. As part of this risk assessment the emergency procedures must be identified and recorded in an emergency plan. The emergency plan must provide details on the procedure to be followed in the event of an emergency situation arising and the rescue arrangements. The main contractor's safety advisor must assist in the preparation of both the risk assessment and the emergency plan. The main contractor will make arrangements to ensure that all those working in a confined space are trained in confined space working and have the risk assessment information briefed to them prior to starting work.

5.16.3 Arrangements For Confined Space Working

The main contractor will make arrangements for working in a confined space including but not limited to:-

- 1. Establishing a confined space permit to work procedure that allows work to be carried out in the confined space without risk to the heath and safety of workers.
- 2. Providing adequate trained supervision involved with supervising confined space working. Those supervising confined space working must have received confined space working training themselves.
- 3. Ensuring that there is an agreed means of communication between those in the confined space and those working as the lookout outside the confined space. This communication may need to be via two way radio if normal conversation is not possible between both parties.
- 4. Establishing testing of the atmosphere prior to entry where identified in the risk assessment and ongoing monitoring of the atmosphere whilst work in the confined space is being carried out.
- 5. Ensuring good ventilation in the confined space to prevent stale air and ensure the air quality remains breathable.
- 6. Removing any residues that may be present in the confined space which may give rise to risk or increase the risk to those working in the confined space.
- 7. Isolating the confined space from any gasses, liquids or other flowing materials that may enter the confined space. This isolation should be in the form of a lock-off and isolation permit in order to prevent any accidental flow into the confined space.

- 8. Ensuring that safe access and egress are provided into and out of the confined space. Where multiple access is required to a confined space a tally must be kept of the names of the workers in the confined space for emergency purposes.
- 9. Ensuring that where there is excessive temperature in the confined space the working shift is reduced and frequent breaks are provided. Arrangements must also be made to ensure that workers do not become dehydrated whilst working in excessive temperatures.
- 10. Establishing an emergency procedure to deal with the rescue or recovery of any workers who become injured or endangered in the confined space.

The main contractor must ensure that the permit to work procedures and working arrangements are regularly checked and audited to identify any non compliance from the agreed procedure.

5.17 WORK ON OR OVER WATER

5.17.1 General Requirements

The main contractor must ensure that where there is a risk of personnel falling into water and a possibility of drowning a full and detailed risk assessment must be prepared. It is prohibited for the main contractor to rely solely on the fact that workers can swim when identifying the necessary level of control.

5.17.2 Prevention Of Falls Into Water

The main contractor is to take all measures reasonably practicable to prevent falls into water. Where there is still a risk that workers could fall into water the following procedures must be followed:-

- 1. A rescue boat should be provided where there is a risk of workers being swept away by the tide or where rescue from the shore is not possible.
- 2. All off shore workers are to be trained in off shore procedures and emergency arrangements.
- 3. Where life rings are provided they must be provided with a 30 metre life line and at a distance of no more than 60 metres apart.
- 4. For night time working workers must be provided with chemical light sticks and the rescue boat must be fitted with high powered search lights.
- 5. All workers are to be provided with a life jacket equipped with a whistle and emergency light.
- 6. Strictly no lone working at any time.

The main contractor must provide training to all workers who are involved in work on or over water. This training must cover the safe system of work identified in the risk assessment and method statement as well as the emergency procedure. Emergency drills must be carried out on a regular basis to test the effectiveness of the procedure.

5.18 FIRST AID REQUIREMENTS

5.18.1 General Requirements

The Main Contractor shall ensure the availability of one certified first aider prior to the commencement of the works for prompt medical attention in case of serious injury.

All First Aiders and Male Nurses shall be fully qualified for their respective position and copies all certification and qualifications shall be maintained at the site office at all times for EHS Dept personnel inspection.

First Aid provisions are dependent on the number of personnel working on the Project. Reference should be made to the Dubai Municipality Code of Construction Safety Practice which details the First Aid facility requirements depending on the number of personnel on the project.

5.19 USE OF HAZARDOUS SUBSTANCES

5.19.1 Definition Of Hazardous Substance

A hazardous substance is any substance in solid, liquid, vapour, aerosol, gas or particulate form that has the potential to cause harm or ill health. For a list of hazardous substances the main contractor should refer to **Table 2 & 2a** in this regulation. Further information on specific hazardous substances can be obtained from the Manufacturers Safety Data Sheet (MSDS).

5.19.2 General Requirements

The main contractor is to ensure that where a hazardous substance is assigned an Maximum Exposure Limit (MEL) the MEL must not be exceeded under any circumstances. Where a hazardous substance is assigned an MEL the main contractor must set up procedures for monitoring exposure to the hazardous substance.

5.19.3 Assessment Of Risk

The main contractor must under take a risk assessment for the use of all hazardous substances. Where alternative less hazardous substances are available which serve the same purpose the main contractor must give consideration to these substances. If these less hazardous substances are not used the main contractor must make justification to EHS as to why these alternatives are not used. The following is a guide to the risk assessment process for hazardous substances.

Step 1. The main contractor must asses the risk to health from hazardous substances used in or created by his undertaking. The manufacturers safety data sheet (MSDS) should be used as a guide for preparing the risk assessment for a particular hazardous substances.

Step 2. The main contractor must decide what precautions are needed, he must not carry out work which could expose his workers to hazardous substances without first considering the risks and the necessary precautions.

Step 3. As a priority the main contractor should consider measures that prevent exposure to hazardous substances. Where preventing exposure is not reasonably practicable he must adequately control exposure

to hazardous substances. Personal protective equipment is always to be considered as a last resort when controlling exposure.

Step 4. The main contractor must ensure that where engineering control measures are used to prevent or reduce exposure they must be properly maintained. Procedures must be developed for the use and maintenance of engineering control measures. Where maintenance is required a preventative maintenance program must be developed.

Step 5. The main contractor must ensure that exposure to hazardous substances is monitored where required.

Step 6. Where a substance is assigned an MEL the main contractor must ensure that appropriate health surveillance is provided, where necessary, to those who may become exposed to a hazardous substance.

Step 7. The main contractor must ensure that plans and procedures to deal with accidents, incidents and emergencies are prepared where necessary.

Step 8. Every main contractor must ensure that workers are properly informed, trained and supervised. He should provide his employees with suitable and sufficient information, instruction and training.

All risk assessments for hazardous substances must be signed and dated by the person undertaking the assessment.

5.20 ILLUMINATION

5.20.1 General Access Lighting Requirements

The main contractor is to ensure that where work is carried out in the absence of natural light, including during the hours of darkness, illumination levels provided allow for the safe access of workers. This must take into account any illumination that is required for the safe use of vehicles and pedestrian crossing points. Any artificial lighting that is provided must be properly maintained and in the case of fire escape routes, must have battery backup where power failure would result in illumination levels being below those required in these regulations.

5.20.2 Task Lighting

The main contractor must ensure that sufficient task lighting is provided where the minimum illumination levels cannot be achieved with natural lighting. Where artificial lighting is provided for task specific purposes the main contractor must ensure that any shadows cast do not effect the workers ability to carry out the work safely.

5.20.3 Working At Height

Where work at height is carried out the main contractor must ensure as far as practicable that lighting levels allow for the work to be carried out safely. Where artificial lighting is provided special care must be taken to ensure that shadows are not cast in any area where there is a risk of falling.

5.20.4 Minimum Illumination Levels

The main contractor is to ensure that the minimum illumination levels detailed in **Table 5** of these regulations and standards are achieved at all times.

5.21 CRANES AND LIFTING OPERATIONS

5.21.1 General Requirements

The main contractor is to ensure that all lifting operations are carried out in a planned and safe manner. All lifting equipment must be tested in accordance with the Dubai Municipality Code Of Construction Safety Practice, where any lifting equipment is used for lifting persons the test frequency must be 6 monthly. Risk assessments must be undertaken for all operations where mechanical lifting is carried out, this includes but is not limited to lifting carried out by cranes, excavators, forklifts and hoists. The risk assessment must identify how lifting is to be carried out safely and must be communicated to all those involved in supervising and carrying out the lifting operation. (See also Section 2.13)

5.21.2 Lifting Plans

In the case of tower cranes, crawler cranes and mobile cranes a lifting plan must be prepared by the main contractor. The lifting plan must include the following information:-

- 1. Details of the person in overall charge of all lifting operations (the *Appointed Person*), including relevant experience of this person in planning lifting operations.
- 2. A list of responsibilities of those involved in lifting operations including, person in overall control, crane operator and signaler / slinger.
- 3. An overview procedure detailing how lifting operations will be planned, supervised, monitored and reviewed.
- 4. Details of the crane(s) capacities at various radius.
- 5. Copies and a register of all crane operator competency certificates issued by an EHS approved third party.
- 6. Copies and a register of all signaler / slinger competency certificates issued by an EHS approved third party.
- 7. Copies of all test certificates for the cranes to be used issued by an EHS approved third party engineer.
- 8. A schedule of common lifts to be undertaken by the crane detailing what is to be lifted, weight of load and how.

- 9. A written procedure detailing how special lifts will be planned to ensure they can be carried out safely. A special lift is any lift not detailed in the schedule of common lifts.
- 10. A written procedure detailing the planned maintenance requirements of each type of crane and the inspections and checks that must be carried out.
- 11. Copies of all risk assessments undertaken for crane lifting operations.

5.21.3 Competency Of Personnel

The main contractor is to ensure that all those involved in lifting operation are competent to carry out their work safely. The Appointed Person shall possess the necessary knowledge and experience to ensure that all lifts are planned and can be executed safely. All crane operators and signaler / slingers are to be trained and certified by a third party approved by EHS. All signaler / slingers must be easily identifiable and the working "Crane Banksman" or "Signaler/Slinger" must be printed on their coveralls.

5.21.4 In Service Inspection Of Cranes

All cranes are subject to a weekly inspection by a competent person. The main contractor is to ensure that inspections are carried out and recorded for each crane in use on the project. The inspection should take into account the items recommended by the crane manufacturer and include lubrication as recommended by the manufacturer.

5.21.5 High Winds

The main contractor is to ensure that an anemometer is fitted to the highest crane on their project and is kept in good working condition. The main contractor must ensure that wind speeds are monitored and that cranes are stopped when the wind speed exceeds the maximum speed stated in the manufacturers operating manual. The main contractor will also ensure that where loads with a large surface area are lifted wind condition are assessed and the lift is stopped if the load cannot be controlled.

5.21.6 Climbing Frames

The main contractor will ensure that where a climbing frame is used on a tower crane the frame must be tested and certified by a competent third party engineer in accordance with the crane manufacturer's manual. Following use the climbing frame will be lowered in accordance with the crane manufacturer's manual.

5.21.7 Communication

The main contractor will ensure that there is an effective means of communication in place between every crane operators and signaler / slinger. Where there is no clear line of sight between the crane operator and the signaler / slinger radio communication must be used. In any case on all tower cranes erected over the height of 35 metres measured from the ground to the operators cab radio communication will be used.

5.21.8 Lifting Accessories

The main contractor will ensure as a minimum that all lifting accessories are thoroughly examined by a competent person every 6 months. All lifting accessories that have been thoroughly examined by a competent person and deemed to be in a condition that is safe to use must be clearly identifiable. The main contractor is to operate a colour coded tagging system to identify lifting accessories that are safe to use and the colour shall be in use for the validity period of the thorough examination. The tag colour for the current period must be clearly displayed at the site and all signaler / slingers are to be briefed on the colour tagging arrangements. The main contractor is to ensure that arrangements are in place to maintain the colour tagging system. Under no circumstances are lifting accessories to be used that have not passed a thorough examination within the previous 6 months.

5.21.9 Emergency Arrangements

The main contractor must ensure that subcontractors he may employ to erect and maintain tower cranes have procedures in place to deal with any emergency situation that may arise. This will include but not be limited to workers becoming suspended by their safety harness following a fall. These procedures must make provision for the rescue of workers and include a rescue buddy system such as the 'Gotcha Rescue Kit'.

5.22 MOBILE ELEVATED WORK PLATFORMS (MEWP'S)

5.22.1 General Requirements

The main contractor must ensure that where MEWP's are used a risk assessment is undertaken to identify the specific health and safety requirements of the work. When using a MEWP the main contractor must ensure the following:-

- 1. The operator is fully trained and competent.
- 2. The work platform is provided with guard rails and toe boards.
- 3. Outriggers are extended and chocked as necessary before raising the platform
- 4. All workers know what to do if the machine fails with the platform in the raised position.
- 5. An inspection of the MEWP must be carried out and recorded by the operator on a daily basis.
- 6. The MEWP must be suitable for the conditions it is required to be used in i.e. rough terrain
- 7. Harnesses must be worn by workers in the MEWP where identified as necessary in the risk assessment or if required by the manufacturer in the operating manual.

5.23 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

5.23.1 General Requirements

The main contractor is to 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. In the case of hard hats the main contractor will ensure that the requirements of either the British

Standard or the American National Standards Institute are complied with. The minimum requirements for PPE on all projects where these regulations apply will be; Hard Hat, Safety Footwear and Hi-Vis vests or jackets. All PPE issued including equipment for fall arrest will comply with internationally recognized standards such as; American, Australian or European.

5.23.2 Financial Cost

The main contractor will be responsible for all costs associated with supplying PPE to his workers. Under no circumstances is the main contractor allowed to make any charge financially or otherwise for PPE issued to his workers.

5.23.3 Training

The main contractor will ensure that all personnel under his control are trained in the fitting, use and maintenance of personal protective equipment. As part of the training the main contractor 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 workers to prevent them becoming complacent in the wearing of PPE.

5.24 SPECIAL TOOLS

5.24.1 Definitions

Special tools are tools which present an additional risk of injury during their use owing to the operating speed, power, torque or complicated nature of the tool. The following are classed as special tools:-

- 1. Cartridge operated tools
- 2. Abrasive wheel machines all types
- 3. Hand held and bench circular saws
- 4. Core drilling rigs
- 5. Compressed air driven tools

5.24.2 General Requirements

The main contractor must ensure that special tools are used only by those workers that have received specific training on the use of the tool. Where available this specific training is to be carried out by the tool manufacturer. The main contractor is to ensure that those trained in the use of special tools are clearly identifiable, for example with a hard hat sticker. Supervisors and foreman must also be trained in the use of special tools that may be used by workers under their control.

5.24.3 Guarding Requirements

The main contractor must ensure where a special tool is fitted with a guard, as in the case of abrasive wheel machines and circular saws, the guard must always be in place when the tool is used. An inspection and maintenance procedure must be developed by the main contractor to ensure the guarding requirements of this regulation are fully complied with.

5.25 LONE WORKING

5.25.1 Definition Of Lone Working

For the purpose of these regulations lone working is defined as any situation where a worker is alone by virtue of the fact that supervision or other workers are not present. Lone working requirements will apply to all workers employed in construction activities and also any night watchman or security guard that is employed by the main contractor.

5.25.2 General Requirements

The main contractor is to undertake a risk assessment for any situation that may arise where workers may be working alone. The risk assessment must take into account arrangements that must be in place to safeguard the worker and deal with any situations that may arise including emergencies. The following work is prohibited for lone workers:-

- 1. Work at height where safety harnesses are required.
- 2. Work on or over water where there is a risk of falling into the water.
- 3. Work in excavations deeper than 2.0 metres.

The risk assessment carried out by the main contractor may identify other work activities that are not to be carried out by lone workers.

5.25.3 Means Of Summonsing For Help

The risk assessment carried out by the main contractor must identify the procedure to be employed in the case of the lone worker requiring assistance in the event of an accident or emergency situation. Typical planning will include but not be limited to the use of mobile telephones and regular reporting in calls. The main contractor will ensure a procedure is in place to deal with any situation that may arise where a lone workers does not report in.

5.25.4 Training

The main contractor will ensure that all persons involved in lone working, including those who the lone worker reports in to, are fully trained on the lone working procedure and the emergency arrangements to be employed. Regular refresher training must be provided and the main contractor must test the procedure for raising the alarm on a regularly.

5.26 GOOD ORDER

5.26.1 General Requirements

The main contractor must ensure that his site is kept in good order at all times. This includes ensuring that regular housekeeping is carried out to minimize the risk or trips and falls. All scrap wood from

shuttering/formwork and temporary works will be de-nailed as soon as it is dismantled. All access routes must be properly maintained and illuminated in accordance with Regulation 19 and Dubai Municipality Code Of Construction Safety Practice. Emergency escape routes must be clearly marked with appropriate signage and inspected regularly to ensure they remain clear at all times.

5.26.2 Fire Prevention Requirements

The main contractor will organize and manage his site at all times so as to prevent the risk of fire so far as reasonably practicable. Waste piles must not be allowed to accumulate so that they become a fire risk. All flammable materials and liquids will be stored in a suitable area that is outside the building and away from rest / office accommodation areas.

5.26.3 Segregation Of Waste

The main contractor will ensure that different waste streams are segregated and removed from site by licensed contractors. As a minimum waste must be segregated into the following categories:-

- 1. Hazardous waste which includes waste oil, paints, thinners, solvents, etc.
- 2. Construction waste which includes general arising from construction activities.
- 3. Food waste which will be kept in sealed containers and cleared on a daily basis.

Any lightweight waste such as packaging must be placed in containers or rubbish skips and covered to prevent the waste being blown around the construction site. The main contractor is strictly prohibited from burning any waste on site.

5.27 CONTROL OF CONTRACTORS

5.27.1 General Requirements

The main contractor is responsible for exercising management control over all subcontractors that he may employ. The main contractor must ensure the health and safety competency of all subcontractors at the pre-tender stage by carrying out a health and safety prequalification on prospective subcontractors. During the prequalification process the following should be determined by the main contractor:-

- 1. Experience of the subcontractor carrying out similar work
- 2. Past health and safety performance including details of any penalties imposed by PCFC EHS or Dubai Municipality.
- 3. Details of serious accidents and any fatalities that may have occurred.
- 4. Action taken in the event of serious accidents or any fatalities to prevent recurrence.
- 5. The ability of the subcontractor to manage workers in accordance with health and safety requirements.
- 6. Details of health and safety training courses that managers have attended.
- 7. Professional qualifications of the subcontractor's health and safety department.

The main contractor must review all health and safety prequalifications received from prospective subcontractors and take health and safety performance into account when selecting the successful subcontractor.

5.27.2 Requirements On Subcontractors

Every subcontractor must ensure they work with the main contractor in following health and safety regulations and ensuring the safety of those workers that they employ.

5.28 SECURITY ARRANGEMENTS

5.28.1 General Requirements

The main contractor is to ensure that all reasonably practicable measures are taken to prevent unauthorized access to his work site. Where there is a risk of others entering the site, fencing and 24 hour security patrols must be provided. Particular attention is to be given to projects that are partly completed where units are occupied. In these situations the measures taken are to ensure that adequate provisions are made to prevent children entering the site.

5.28.2 Security Personnel

The main contractor will ensure that all security personnel are trained in their duties and provided with information on the action to take in the event of site emergencies. The main contractor is to ensure that security personnel have a means of communication to communicate emergencies and raise the alarm as necessary. Security personnel must receive fire safety training which must include practical training on the use of fire extinguishers.

5.29 CONTROL OF NOISE AT WORK

5.29.1 Action Levels

For the purpose of this regulation the main contractor will be aware of action levels that exist for the control of noise at work. The action levels are as follows:-

- 1. First Action Level means a daily personal noise exposure of 85 dB(A) based on an 8 hour time weighted average period per day.
- 2. Second Action Level means a daily personal noise exposure of 90 dB(A) based on an 8 hour time weighted average per day.
- 3. Peak Action Level means a level of peak sound pressure of 200 pascals.

5.29.2 General Requirements

The main contractor will ensure that where his workers are exposed to the first action level or above or the peak action level or above a noise assessment is carried out by a trained and experienced person. The assessment must identify the workers at risk and the noise levels to which those workers are exposed to.

The main contractor will ensure that the risk of damage to the hearing of his workers from exposure to noise is reduced to the lowest level reasonably practicable.

5.29.3 Reduction Of Noise Exposure

The main contractor will ensure that where his workers are exposed to the second action level or above or the peak action level or above he must reduce exposure to noise of these workers so far as is reasonably practicable. Reduction of exposure is to be by any means other that the use of personal ear protectors.

5.29.4 Use Of Personal Ear Protection

The main contractor is to rely on the use personal ear protection only after the measures taken in 29.3 have failed to reduce the workers exposure to noise to below the first action level or below the peak action level. Where a worker is exposed to noise in excess of the first action level but below the second action level the main contractor is to ensure that personal ear protection is provided at the request of the workers. Where a worker is exposed to noise levels in excess of the second action level or in excess of the peak action level the main contractor must provide personal ear protection to every worker and the wearing of the personal ear protection must be enforced.

5.29.5 Hearing Protection Zones

The main contractor is to ensure that any area or areas that form part of his work site, where workers may be exposed to noise levels in excess of the second action level or in excess of the peak action level, are clearly identified. The areas are to marked as personal ear protection zones and the main contractor is to enforce the wearing of personal ear protection in these zones.

5.29.6 Training

The main contractor is to ensure that all workers that either request personal ear protection, or are required to wear personal ear protection as prescribed by these regulations, are provided with adequate information, instruction and training. This will cover the risks of exposure to high levels of noise as well as the fitting, use, maintenance and storage of the personal ear protection.

5.29.7 Health Surveillance

The main contractor is responsible for ensuring that health surveillance is carried out for any workers that are permanently exposed to noise levels in excess of the second action level or the peak action level. For the purpose of this regulation permanent exposure will be considered as exposure that forms the main part of the workers daily duties. Health surveillance will take the form of audiometric testing that will be carried out in the first month of the worker commencing work and then every 2 years.

5.30 MISCELLANEOUS REQUIREMENTS

- EHS representatives shall be invited for attending all project meetings and the detailed addresses of the Contractors/Sub-Contractors, Project Managers & Consultants, shall be provided to the Competent Department for co-ordination & record.
- 2. The main contractor shall obtain NOC for site mobilization from PCFC Civil Engineering Department.
- 3. All the contractors shall clearly display the project details at the site as per PCFC Civil Engineering Standards & Specification.
- 4. The main contractor shall be responsible for ensuring Health & Safety of workers and shall comply with all PCFC EHS Rules & Regulations and where relevant, Dubai Municipality Construction Safety Code of Practice. Penalties as per EHS Rules shall be imposed on the main contractor for any failure in compliance.
- 5. "Fire Regulations" as stipulated in Chapter-4 shall be strictly followed. PCFC Fire Department Emergency Telephone number shall be conspicuously displayed at the site.
- 6. Provision of Septic Tank/ Holding Tank should be made available (without soakaways)
- Adequate mess hall/dining/changing facility shall be provided at the site for all industry/site workers. Necessary approvals shall be obtained from EHS Department.
- 8. Cooking is not allowed at any construction sites other than the licensed Canteens and Eating Establishments. These Eating Establishments shall conform to the requirements of PCFC and approval shall be obtained from EHS Department.
- 9. Housekeeping both within and outside the construction sites, canteens and other areas shall be maintained as per PCFC requirements.
- 10. All wastes shall be handled and collected in suitable containers/skips for necessary disposal with the approval of the Authority. No industrial/trade wastes shall be dumped in sewers, garbage bins, roadsides, and storm water drains etc.
- 11. No wastes (solid, liquid or airborne) shall be disposed/released without appropriate approvals from the Authority. Dumping of construction and excavated waste within the PCFC areas is prohibited.
- 12. All facilities generating wash/process wastewater shall have valid disposal permits from PCFC and/or DM.
- 13. Waste oils shall be recycled/disposed only after obtaining requisite approvals from the Authority.
- 14. No storage of hazardous chemicals or industrial waste effluent generation shall be allowed on the construction sites.
- 15. Cutting Gas Cylinder storage shall be as per relevant EHS Requirements.
- 16. Diesel Oil drums, Paint drums, Thinners, Flammables etc. shall be stored as per the MSDS. Quantities stored on site shall be restricted to the bare minimum required for two days job only.
- 17. A Hot Work Permit duly signed by the site manager, safety advisor and supervisor performing the job shall cover gas cutting and welding operations. Copy of the permit shall be displayed near the work area.
- 18. For spray painting/blasting operation, a proper painting/blasting booth shall be constructed with a proper extraction/filtration system. These systems shall conform to EHS requirements.
- 19. All the heavy equipment's i.e. Forklifts, JCB etc. shall be fitted with reverse alarm system.

- 20. All Lifting Equipment, Tools and Tackles shall be tested as per EHS Requirements by approved 3rd. Party agencies.
- 21. All excavated trenches shall be effectively protected to prevent any accidental fall. Excavations exceeding more than 1.2 metres depth shall be shored adequately and trench ladders shall be provided.
- 22. The main contractor shall be held responsible for any incident/accident at the construction site. All serious incidents/accidents (those with the potential to become reportable) shall be reported to EHS Emergency Control Centre (ECC) (04-8831111) immediately. Penalties on defaulters shall be imposed as per EHS Rules. The Authority's decision in this regard shall be final.
- 23. EHS Requirements for Labour Camps/temporary Accommodation shall follow the **H,S&F Guidelines** issued by the Competent Department.

5.31 PROHIBITION AND IMPROVEMENT NOTICES

5.31.1 General Requirements

As part of their role as an enforcement authority EHS will identify any activities where there are significant risks to the workers that have not been adequately controlled by the main contractor. In situations where it is reasonably foreseeable that a worker could become fatally injured EHS will serve a prohibition notice on the main contractor for a particular work activity or area, this will impose an immediate stop on the unsafe work. In situations that are less serious involving breaches of regulations where workers are not exposed to immediate danger, EHS will issue an Improvement notice and state a time period for the improvements to be made.

5.29.2 Compliance With A Prohibition Or Improvement Notice

Where a main contractor has complied with the requirements of a prohibition notice he must inform EHS initially by telephone (in writing soon after) on the action that he has taken before allowing his workers to continue work. Where deemed appropriate by EHS they will inspect the area to check if the requirements of the notice have been fully complied with. The main contractor shall follow up the telephone call in writing detailing the action that has been taken to correct the unsafe condition and prevent it from recurring. In the case of improvement notices the main contractor is to record in writing to EHS the action he will be taking to comply with the notice.

5.31.3 Offences Under This Regulation

Where any main contractor fails to comply with the requirements of a prohibition or improvement notice by allowing work to either continue or resume before the necessary action has been taken he will be subject to financial penalties as detailed in Regulation 31. In addition EHS reserve the right to remove the offending Project Manager permanently from the project at their discretion.

5.32 FINANCIAL PENALTIES

5.32.1 General Requirements

Financial Penalties will be imposed on main contractors for infringements of health and safety requirements in accordance with the following table:-

Item	Description of Offence	Maximum Fine
1	Fatal accident as a consequence of management	AED200'000
	failures	(two hundred thousand)
2	Serious injury as a consequence of management	AED100'000
	failures	(one hundred thousand)
3	Failure to immediately report a fatal accident (this is in	AED75'000
	addition to item 1)	(seventy five thousand)
4	Failure to immediately report a serious injury or near	AED75'000
	miss incident / accident (this is in addition to item 2	(seventy five thousand)
	and 5)	
5	Serious near miss incidents as a result of management	AED50'000
	failures	(fifty thousand)
6	Failure to comply with the requirements of a	AED50'000
	prohibition notice issued by EHS	(fifty thousand)
7	Failure to meet the requirements of an improvement	AED50'000
	notice within the timeframe assigned by EHS	(fifty thousand)
8	Consistent failure to take action on safety	AED25'000
	infringements highlighted during EHS inspections	(twenty five thousand)
9	Failure to pass a Certificate of Conformity I or II EHS	AED1000
	inspection requested by a main contractor	(one thousand)

All main contractors should note that past health and safety performance will be taken into account when financial penalties are imposed. Main contractors with a good track record in the management of health and safety may receive reduced financial penalties where appropriate. It should be noted that any main contractor failing to make payment of a financial penalty within the specified time will be subject to having COC and Building Completion Inspections suspended.

5.32.2 Use Of Funds Generated From Financial Penalties

All Main Contractors are advised that excess financial penalties collected by EHS will be re-invested in the promotion of Environment, Health and Safety initiatives.

SECTION - 6

HEALTH & SAFETY REQUIREMENTS AT PORTS & PORT FACILITIES

6.0 APPLICATION & SCOPE

These regulations apply to all vessels, companies and organizations entering or making use of Ports under the jurisdiction of PCFC-Dubai Port Authority. Neither non-possession nor ignorance of these regulations will be considered a reason of non-imposition of a penalty for violation of these regulations. These Regulations are issued to empower the Port Management to make and enforce Regulations to ensure safe and efficient operation of the Port. Nothing in these Regulations shall be construed as over-riding or contradicting to:

a) The Laws of the UAE

b) The provisions of international, national or regional regulations as applicable.

c) The practice of good seamanship.

Nothing contained herein shall be construed as relieving the Master of any Vessel from his responsibility for the safety of the Vessel under his command. The PCFC-Dubai Port Authority reserves the right at any time, to alter, change or amend any or all of the provisions contained in these Regulations with or without prior notice.

6.1 ROLES AND RESPONSIBILITIES

6.1.1 Conduct in port

No one within the jurisdiction of these regulations shall endanger, hinder or interfere with a vessel's movements or port operations or cause any damage.

6.1.2 Legal arrangements for Authority

- 6.1.2.1 All official orders and/or instructions issued by persons authorized by the PCFC shall be obeyed at once. They may be given verbally, in writing or by displaying signs and notices.
- 6.1.2.2 Authority shall be provided with any pertinent information required concerning the vessel including but not limited to, it condition, construction, equipment, cargo, crew or any incident on board which is considered at variance with the laws of the country to which the port belongs. They are also entitled to check the vessel's documents.
- 6.1.2.3 Authority personnel are allowed to enter and examine vessel to ensure security and good order, to prevent illegal action to navigation safety as well as for reasons of health and lawfulness. Should the Authority personnel, after boarding the vessel suspects that it is substandard, then he has the right to conduct a more through inspection.
- 6.1.2.4 The Authority reserves the right to take the action required by the appropriate international convention or protocol if there are any discrepancies in the ship's certificates.
- 6.1.2.5 The master is obliged to ensure safe access to the vessel at all times. Likewise, port users must permit access of Authority personnel.

6.1.2.6 No person shall molest, assault, resist, hinder or obstruct the Authority in the execution of their duty, or attempt to do so, or use offensive language against them, or and or incite others to do so.

6.1.3 General EHS Requirements relating to Port Activity

- 6.1.3.1 Workplaces, equipment and methods of work that are safe and without risk of injury to health
- 6.1.3.2 Safe means of access to any workplace
- 6.1.3.3 Providing the information, training and supervision necessary to ensure the protection of workers against risks of accident or injury to health arising out of or in the course of their employment
- 6.1.3.4 Providing workers with any personal protective equipment and protective clothing and any life-saving appliances reasonably required where adequate protection against risks of accident or injury to health cannot be provided by other means
- 6.1.3.5 Providing and maintaining suitable and adequate first-aid and rescue facilities
- 6.1.3.6 Developing and establishing proper procedures to deal with any emergency situations which may arise.
- 6.1.3.7 In case of an accident, the parties responsible for the accident will be held responsible for any loss or damage caused to property of the port management

6.1.4 Responsibility of Port workers

Safety is also a matter for all port workers, who should:

- 6.1.4.1 Inform themselves of the risks inherent in their work and take full advantage of any vocational training courses available.
- 6.1.4.2 Cooperate with ships' officers to ensure that their activities do not give rise to hazards to the safety or health of crew members
- 6.1.4.3 Acquaint themselves with and carry out all safety and health instructions relating to their work.
- 6.1.4.4 Comply strictly with all safety rules and instructions at all times make proper use of all safeguards, safety devices and other appliances furnished for their protection or the protection of others
- 6.1.4.5 Refrain from careless or reckless practices or actions that are likely to result in accidents or injuries to health;
- 6.1.4.6 As soon as practicable, notify their supervisor (and, where appropriate, a Competent Department inspector) of any operation or equipment which they consider to be defective or otherwise dangerous. Such operations or equipment should not be further used until it has been checked and approved for further use.
- 6.1.4.7 cooperate in the training of new workers, giving them the benefit of their experience.
- 6.1.4.8 not interfere with, remove, alter or displace any safety devices and other appliances provided for their personal protection or that of others, or interfere with any procedure or safe system of work, except in an emergency or with proper authorization.

6.1.4.9 Be aware that other persons might be affected by their actions when carrying out port work. In some countries, port workers have a legal responsibility in connection with the safety and health of others, as well as themselves.

6.1.5 Responsibility of Contractors and labour or service providers

Contractors and labour or service providers should cooperate with port authorities and other bodies working in port areas to protect the safety and health of all persons who may be affected by their activities. In particular, they should ensure that:

- 6.1.5.1 All workers they employ or supply are appropriately trained and competent to perform the work they are required to do in port areas
- 6.1.5.2 All such persons are aware of the particular hazards of the port areas in which they are to work, the hazards and precautions to be taken in connection with port work in general, and any local rules
- 6.1.5.3 All such persons are appropriately supervised
- 6.1.5.4 All plant and equipment that they supply or use is of sound construction and properly maintained in a safe condition
- 6.1.5.5 They supply such information as is necessary to others who may be affected by their activities
- 6.1.5.6 They cooperate with the port authority, other employers and any other relevant bodies.

6.1.6 Responsibility of Vessel's Master

- 6.1.6.1 It shall be the duty of the master of every vessel to comply with the requirements of the regulations in so far as the vessel is concerned. The vessel's master shall be responsible for all damages that may be caused by his vessel, crew, or other persons in his services to any property. The port management has the right to detain any vessel which has caused damage to public property until such damage has been made good, or a security has been provided to the satisfaction of the port management.
- 6.1.6.2 The vessel's master shall be responsible for and give special care to all the requirements of governmental agencies and agents: customs authorities; master should contact their ships agent for the supply of the necessary instructions.
- 6.1.6.3 Nothing in these regulations shall relieve the master of any vessel entering or navigating within the limits of a port of his responsibilities for the vessel under his command.

6.1.7 Responsibility Ships' officers

Ships' officers should cooperate with shore personnel as necessary. This should include:

- 6.1.7.1 Providing safe means of access to the ship and to any place on the ship where port workers need to work
- 6.1.7.2 Ensuring that any ship's equipment that will be used by port workers is of sound construction and properly maintained
- 6.1.7.3 Providing such information as is necessary to port workers on the ship;

- 6.1.7.4 Ensuring that the activities of the ship's crew do not give rise to hazards to safety or health on the ship
- 6.1.7.5 Ensuring that if the crew works together with port workers , joint safe systems of work are followed to protect the safety and health of all involved.

6.1.8 Responsibility of Ship's Agent

The ship's agent is responsible for informing the port management of all relevant information and message received from the master of a vessel including information regarding any accidents within the port limits due to carelessness or any other reasons.

6.1.9 Responsibility of Other persons at work

Any other persons who may be present at work in port areas in addition to persons who carry out cargohandling operations (e.g. haulers, ships' crew members, pilots, ships' agents, immigration and customs officers, inspectors, members of the emergency services) should cooperate with the management of the port authority and other organizations with which they are working, and should comply with all relevant legal requirements.

6.1.10 Responsibility of Passengers and other non-workers

Passengers and other members of the general public who may be present in port areas but do not carry out port work should be separated from hazardous operations and instructed on the actions they should take by means of notices, verbal instructions or otherwise, and should comply with such instructions.

6.2 SAFETY AND CONDUCT

6.2.1 Workplace Requirements

Any time that a workplace has become unsafe or there is a risk of injury to health, effective measures shall be taken (by fencing, flagging or other suitable means including, where necessary, cessation of work) to protect the workers until the place has been made safe again.

- 6.2.1.1 Dubai Local Order No. 61/1991 requires the Occupier/Employer to ensure that the workplace, plant and equipment are safe at all times.
- 6.2.1.2 All places where dock work is being carried out and any approaches thereto shall be suitably and adequately lighted.
- 6.2.1.3 Any obstacle liable to be dangerous to the movement of a lifting appliance, vehicle or person shall, if it cannot be removed for practical reasons, be suitably and conspicuously marked and, where necessary, adequately lighted.
- 6.2.1.4 All surfaces used for vehicle traffic or for the stacking of goods or materials shall be suitable for the purpose and properly maintained.

- 6.2.1.5 Where goods or materials are stacked, stowed, unstacked or unstowed, the work shall be done in a safe and orderly manner having regard to the nature of the goods or materials and their packing.
- 6.2.1.6 In the case of ships carrying containers, means shall be provided for ensuring the safety of workers lashing or unlashing the containers.
- 6.2.1.7 Suitable and adequate means for fighting fire shall be provided and kept available for use where dock work is carried out.

6.2.2 Passageways

6.2.2.1 Passageways of adequate width shall be left to permit the safe use of vehicles and cargo-handling appliances

6.2.2.2 Separate passageways for pedestrian use shall be provided where necessary and practicable; such passageways shall be of adequate width and, as far as is practicable, separated from passageways used by vehicles.

6.2.3 Machinery Safety

- 6.2.3.1 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.
- 6.2.3.2 Effective measures shall be provided for promptly cutting off the power to any machinery in respect of which this is necessary, in an emergency.
- 6.2.3.3 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 before this work is begun and adequate measures shall be taken to ensure that the machinery cannot be restarted (Lockout/Tag out) until the work has been completed: Provided that a responsible person may restart the machinery for the purpose of any testing or adjustment which cannot be carried out while the machinery is at rest.

"Lockout/Tagout (LOTO)" refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires that a designated individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorized 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.

- 6.2.3.4 Only an Authorized person shall be permitted to :
 - a) remove any guard where this is necessary for the purpose of the work being carried out;

b) remove a safety device or make it inoperative for the purpose of cleaning, adjustment or repair.

If any guard is removed, adequate precautions shall be taken, and the guard shall be replaced as soon as practicable.

6.2.3.4 If any safety device is removed or made inoperative, the device shall be replaced or its operation restored as soon as practicable and measures shall be taken to ensure that the
relevant equipment cannot be used or inadvertently started until the safety device has been replaced or its operation restored.

6.2.3.5 The term *machinery* includes any lifting appliance, mechanized hatch cover or power-driven equipment.

6.2.4 Electrical Equipment

All electrical equipment and installations shall be so constructed, installed, operated and maintained as to prevent danger and shall conform to such standards as have been recognized by the competent or relevant authority.

6.2.5 Safe Access & Safe Transport

- 6.2.5.1 All passageways should be marked, so far as is reasonably practicable, kept free of any obstruction not related to the work in progress.
- 6.2.5.2 Wherever reasonably practicable, means of access should be so placed that no suspended loads pass over them.
- 6.2.5.3 Wherever necessary, the means of access to a ship should be fitted with a safety net properly secured so as to prevent workers from falling into the water between the ship's side and the adjacent quay.
- 6.1.5.1 Junction plates used with ramps on roll-on/roll-off ships should be so designed and used as to be safe.
- 6.1.5.2 When a ship is being loaded or unloaded alongside a quay or another ship, adequate and safe means of access to the ship, properly installed and secured, shall be provided and kept available.
- 6.1.5.3 When workers have to be transported to or from a ship or other place by water, adequate measures shall be taken to ensure their safe embarking, transport and disembarking; the conditions to be complied with by the vessels used for this purpose shall be specified.
- 6.1.5.4 When workers have to be transported to or from a workplace on land, means of transport provided by the employer shall be safe.

6.2.6 Gangway Requirements

6.2.6.1 The purpose built shore gangway shall be used at all times unless unavailable or unsuitable for the Vessel, at which time the Vessel is to provide a gangway as

- a. Any gangway provided by the Vessel should conform with the Regulations with correctly rigged rails, embarkation steps, safety net, and appropriately positioned lifebuoy.
- b. During the hours of darkness the access area on deck, and where possible, the length of the gangway should be floodlit.
- c. A gangway and manifold watch, shall be maintained at all times by competent shipboard personnel.

6.1.5.1 During the Vessel's stay alongside, notices and information shall be displayed at the gangway access area as required under the relevant Terminal Regulations and Information.

6.2.7 Access to a ship's hold or cargo deck

Access to a ship's hold or cargo deck shall be by means of,

- 6.2.7.1 A fixed stairway or, where this is not practicable, a fixed ladder or cleats or cups of suitable dimensions, of adequate strength and proper construction; or
- 6.2.7.2 By other means acceptable to the competent Department.
- 6.2.7.3 So far as is reasonably practicable, the means of access specified here shall be separate from the hatchway opening.
- 6.2.7.4 Workers shall not use, or be required to use, any other means of access to a ship's hold or cargo deck than those specified here.

6.2.8 Hatch cover or beam

6.2.8.1 No hatch cover or beam shall be used unless it is of sound construction, of adequate strength for the use to which it is to be put and properly maintained.

- 6.2.8.2 Hatch covers handled with the aid of a lifting appliance shall be fitted with readily accessible and suitable attachments for securing the slings or other lifting gear.
- 6.2.8.3 Where hatch covers and beams are not interchangeable, they shall be kept plainly marked to indicate the hatch to which they belong and their position therein.
- 6.2.8.4 Only an authorized person (whenever practicable a member of the ship's crew) shall be permitted to open or close power-operated hatch covers; the hatch covers shall not be opened or closed while any person is liable to be injured by the operation of the covers. This clause shall also apply, mutatis mutandis, to power operated ship's equipment such as a door in the hull of a ship, a ramp, a retractable car deck or similar equipment.
- 6.2.8.5 Every hatchway on the weather deck not protected by means of a coaming of adequate height and strength should be effectively guarded or covered.
- 6.2.8.6 Every 'tween-deck hatchway should, when it is open, be effectively guarded to an adequate height.
- 6.2.8.7 Guards may be temporarily removed on any side of a hatchway where this is necessary for loading or unloading goods.
- 6.2.8.8 If, for technical reasons, if the hatchway is not protected by means of coaming or guard, an authorized person should ensure the safety of the workers.
- 6.2.8.9 Deck cargoes should not be placed on nor vehicles pass over any hatch cover which is not of adequate strength for that purpose.

6.2.9 Deck Openings

- 6.2.9.1 Adequate measures shall be taken to protect any opening in or on a deck where workers are required to work, through which opening workers or vehicles are liable to fall
- 6.2.9.2 Every hatchway not fitted with a coaming of adequate height and strength shall be closed or its guard replaced when the hatchway is no longer in use, except during short interruptions of work, and a responsible person shall be charged with ensuring that these measures are carried out.

6.2.10 Working in the ships hold or on a cargo deck

6.2.10.1 All necessary measures shall be taken to ensure the safety of workers required to be in the hold or on a cargo deck of a ship when power vehicles operate in that hold or loading or unloading operations are taking place with the aid of power-operated appliances.

6.2.10.2 Hatch covers and beams shall not be removed or replaced while work is in progress in the hold under the hatchway. Before loading or unloading takes place, any hatch cover or beam that is not adequately secured against displacement shall be removed.

- 6.2.10.3 Adequate ventilation shall be provided in the hold or on a cargo deck by the circulation of fresh air to prevent risks of injury to health arising from the fumes emitted by internal combustion engines or from other sources.
- 6.2.10.4 Adequate arrangements, including safe means of escape, shall be made for the safety of persons when dry bulk cargo is being loaded or unloaded in any hold or 'tween deck or when a worker is required to work in a bin or hopper on board ship.
- 6.2.10.5 As far as is reasonably practicable, workers should not be required to work in the part of a hold where a trimming machine or grab is operating.
- 6.2.10.6 No person shall enter a vessel's hold or cargo compartment containing goods liable to oxidation or to generate heat giving rise to a lack of oxygen or the emission of poisonous vapours unless or until the master or a responsible ship's officer has taken the necessary safety precautions and declares that it is safe for persons to enter the hold or cargo compartment safely. To support this, PCFC approved gas surveyor shall issue gas free certificate on vessel's behalf.
- 6.2.10.7 The master of every vessel must ensure that proper and adequate lighting is provided in all holds, cargo working compartments and other parts of the vessel where persons engaged in the cargo operation are working, or may have to pass through

6.2.11 Turning of propellers

6.2.11.1 The master of a vessel moored in the port shall not turn her propellers and bow thruster without the permission of the port control.

- 6.2.11.2 While the propellers are turning, responsible person shall be on the bridge and in the engineroom to ensure that the engines can be stopped immediately.
- 6.2.11.3 The master is responsible for advising a vessel ahead, astern or alongside of his intention to use his engines and crew members shall be stationed at the bow and the stern to supply the necessary communications to the bridge.

6.2.12 Engine Repair

The master of a vessel shall ensure that the vessel is ready at any time to leave the berth. The master of nay vessel wishing to carryout engine repairs or adjustments which may affect the mobility of the vessel must first obtain the permission of the port management, and must not commence the repairs or adjustments until such permission has been granted.

6.2.13 Main Engine

6.2.13.1 The main engine shall only be tested with the prior approval of the Port control.

6.2.13.2 The main engines of all Vessels within Port Limits shall always be kept ready for use within the shortest possible notice.

6.2.13.3 Repairs or other work, which may render the Vessel incapable of maneuvering under its own power, are not permitted. In cases of breakdowns that affect the Vessel's readiness to maneuver, the Port Management may agree to allow emergency repairs to be carried out on the condition that adequate safety and precautionary measures are undertaken by the Vessel including hiring sufficient number of tugs. The Port Management reserves the right to shift the Vessel to another berth for the purpose of such repairs.

6.2.14 Funnel discharges

Soot blowing and excessive smoke emissions from the funnel are prohibited. All appropriate measures shall be taken to prevent the emission of sparks from funnels.

6.2.15 Galley Stoves and Cooking Equipment

Only the use of galley stoves and other mechanically secured & approved cooking equipment within the catering area shall be permitted.

6.2.16 Explosives

Vessels carrying explosives are not allowed to enter the Port, without the prior written permission from the Port Management and relevant authorities, who shall, if entry is granted, specify the required precautions and procedures as imposed by the governing authorities.

6.2.17 Firearms

All firearms, including ammunition, shall be declared to the Port Management and relevant authorities who will specify the security arrangements required.

6.2.18 Lost equipment or cargo

- 6.2.18.1 Any cargo or equipment which may fall overboard during cargo operations must at once be reported by the master or one of his officers to the port control.
- 6.2.18.2 The master is responsible under the supervision of the port for the retrieval of equipment or cargo. If not the port authorized to takeover operations and finish them at the expense of the vessel.

6.2.19 Firefighting and Life-saving appliances onboard

- 6.2.19.1 Ships masters must maintain their firefighting & lifesaving appliances according to type and quantity for the number of persons on board, confirming with SOLAS 1974 and protocol and with any other instructions from IMO concerned with evaluation, testing and acceptances of this equipment.
- 6.2.19.2 No person shall willfully damage or misuse any such appliances or the lines attached there to or remove the same from their positions except for the purpose of maintenance work.

6.2.20 Photography prohibited

The use of cameras, including video cameras, within the Port Limits is strictly prohibited without the prior written permission of the Authority.

6.2.21 Swimming and fishing prohibited

No person shall swim or fish in the port.

6.2.22 Restriction on use of ship's boats

Vessels are not to use their own boats or launches except in cases of emergency or with the approval of the port management.

6.2.23 Smoking prohibited

6.2.23.1 Smoking is strictly prohibited in port operational areas.

6.2.23.2 Appropriate warning notices shall be displayed in all those places within the port and on board where smoking is prohibited.

6.2.23.3 Vessels carrying dangerous goods or materials shall prominently display at the gangway or other shore access point boards or notices inscribed:

- Dangerous goods on board
- Smoking strictly forbidden.

This warning shall be written in both English and Arabic, and accompanied by the international prohibition picture sign.

7.2.23.4 Smoking may be allowed only within the dedicated smoking area provided by the vessel and Port Authority.

6.2.24 Laid up vessels

No person shall lay up within the port limits any vessel or marine craft without prior written permission of the port and accordance with the rules and regulations of the port management.

6.2.25 Distress and other sound signals

- 6.2.25.1 A continuous sounding of either long or short blasts by the vessel's siren or whistle means that the vessel requires immediate assistance. This signal is not to be sounded by any vessel or on any occasion whatsoever unless the vessel requires immediate assistance.
- 6.2.25.2 No steam siren, whistle or foghorn shall be sounded within a port expect for the purpose of navigation or giving of an alarm and/or distress signal.

6.2.26 Conduct of the crew

The master or owner of every vessel is held directly responsible of the conduct and behavior of the crew of his vessel while in a port and for the strict observance of the laws of the state in which the port is located. Special attention is drawn to those laws concerning the sale, transfer, or consumption of any narcotics or of alcoholic drinks of any kind.

6.2.27 Shipboard Hot Work

- 6.2.27.1 Repair work involving burning, welding, flame cutting, brazing, grinding and similar operations which produce ignition sources including the use of Naked Lights are prohibited unless a Hot Work Authorization has been issued as per Port requirements.
- 6.2.27.2 Any violation could result in the cessation of the cargo operations and the Vessel requested to vacate the berth and being put to anchor pending a full inquiry.
- 6.2.27.3 The Vessel will be responsible for all the costs and delays whatsoever resulting from such action.

6.2.28 Ship/Shore Co-operation - Vessel Alongside

Whilst a Vessel is alongside at the chemical, liquid , general cargo or container terminal berths:

- 6.2.28.1 he relevant berth user shall appoint and maintain at the Terminal, at all times, a sufficient number of qualified and experienced persons, including a competent person with suitable marine expertise, to monitor the progress of all operations onboard the Vessel and to ensure reliable communications are maintained with the Master and the Port Management.
- 6.2.28.2 The Master shall ensure that his staff who are charged with the responsibility of conducting or overseeing the cargo operations and related duties are qualified and competent, including the ability to communicate in English. Sufficient Vessel personnel shall be made available at all times to ensure that the Port Management requirements for safe and efficient operations and mooring practices, are observed and that adequate ship/shore liaison is maintained. The Master and his delegated staff shall ensure that the instructions and requirements that may be imposed by the Port Management, pursuant to these Regulations, are attended to and performed with reasonable dispatch and in an appropriate manner.

6.2.29 Diving Operations

- 6.2.29.1 No person is authorized to send divers down to perform any hull inspection or any submerged part in the port limits without the permission from the port management.
- 6.2.29.2 All diving operations should be effected in accordance with the safety rules mentioned in the PCFC- EHS requirements and according to the international regulations for preventing collision at sea.

6.2.30 Toolbox Talks

Toolbox talks shall be held by each work team at individual work sites before commencement of the day's activities and again just prior to non routine high risk activities at the discretion of the supervisor. They shall concentrate on the risks of the work being undertaken and the precautions necessary to ensure a safe, healthy and environmentally acceptable working day. The risks associated with the work being undertaken shall be discussed together with the potential risks posed by other groups who may be working in the vicinity. The toolbox talk shall be led by the work site supervisor of the team and shall be given in a language that all members of the team can understand. Proper understanding by team members of hazard controls and recovery provisions shall be selectively tested by the work site supervisor. The work site supervisor shall be able to communicate with his subordinates.

6.3 LIFTING APPLIANCES AND LIFTING GEAR

Every lifting appliance, every item of loose gear and every sling or lifting device forming an integral part of a load shall be :

- 6.3.1.1 of good design and construction, of adequate strength for the purpose for which it is used, maintained in good repair and working order and, in the case of a lifting appliance in respect of which this is necessary, properly installed;
- 6.3.1.2 used in a safe and proper manner and, in particular, shall not be loaded beyond its safe working load or loads, except for testing purposes as specified and under the direction of a competent person.
- 6.3.1.3 Operators of lifting appliances should check the operation of their safety devices before commencing work.
- 6.3.1.4 Lifting appliances, where necessary and reasonably practicable, should be fitted with a means of emergency escape from the driver's cabin. There should be arrangements for the removal of an injured or ill driver without further endangering him.

6.3.2 Testing & Examination of Lifting Appliance and Gears

6.3.2.1 Every lifting appliance and every item of loose gear shall be tested by a competent person before being put into use for the first time and after any substantial alteration or repair to any part liable to affect its safety.

6.3.2.2 Cranes, hoists, lifts, lifting appliances and forklifts, etc. used in workplaces shall be tested and certified by EHS Authorized persons/agencies **(See H,S&F Guidelines)** once in every 12 months. Lifting gears shall be retested at such times as prescribed by the competent Department (preferably every six months).

6.3.2.3 A competent person shall issue a certificate of safety after due examination and test , and only after any repairs have been carried out, specifying the serial number, technical details, tests done, safe working load, etc. for each equipment/appliance.

- 6.3.2.4 The repairs identified by the competent person shall be carried out by the owner/occupier immediately.
- 6.3.2.5 Any re-rating of safe working load or any other condition stipulated for the safe operation shall be clearly indicated in the certificate.
- 6.3.2.6 Safe working loads shall be displayed on the appliance. Compliance certificate shall be kept at the site.
- 6.3.2.7 In addition to the requirements of the above clause, every lifting appliance and every item of loose gear shall be periodically thoroughly examined and certified by a competent person. Such examinations shall take place at least once in every 12 months. A 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 appliance or item of loose gear examined.

6.3.3 Inspection of Loose Gear

6.3.3.1 Every item of loose gear shall be inspected regularly before use. Expendable or disposable slings shall not be reused. In the case of pre-slung cargoes, the slings shall be inspected as frequently as is reasonably practicable. For this purpose, an inspection means a visual inspection by a responsible person carried out to decide whether, so far as can be ascertained in such manner, the gear or sling is safe for continued use.

- 6.3.3.2 No heat treatment should be applied to any item of loose gear unless the treatment is carried out under the supervision of a competent person and in accordance with his/her instructions
- 6.3.3.3 Suitable and adequate dunnage should be used if necessary to protect slings of preslung cargoes.
- 6.3.3.4 Slings which have not been approved or inspected should not under any circumstances be used for pre-slinging.
- 6.3.3.5 Every lifting beam, lifting frame, vacuum lifting or magnetic lifting device which does not form an integral part of a lifting appliance and every other item of loose gear weighing more than 100 kg should be clearly marked with its own weight.
- 6.3.3.6 No lifting appliance, loose gear or other cargo-handling appliances shall be used if the competent Department is not satisfied by reference to a certificate of test or examination or to an authenticated record, as the case may be, that the necessary test, examination or inspection has been carried out in accordance with the provisions of this Convention; or in the view of the Competent Department, the appliance or gear is not safe for use.

Also the above clause 6.3.3.6 shall not be so applied as to cause delay in loading or unloading a ship where equipment satisfactory to the competent Department is used.

6.3.4 Records of Lifting Appliances & Lifting Gears

6.3.4.1 Duly authenticated records as will provide prima facie evidence of the safe condition of the lifting appliances and items of loose gear concerned shall be kept, on shore or on the ship as the case may be; they shall specify the safe working load and the dates and results of the tests, thorough examinations and inspections referred to the above clause.

- 6.3.4.2 A register of the lifting appliances and items of loose gear shall be kept in a form prescribed by the competent Department, account being taken of the model recommended by the International Labour Office.
- 6.3.4.3 The register shall comprise certificates granted or recognized as valid by the competent Department, or certified true copies of the said certificates, in a form prescribed by the competent Department, account being taken of the models recommended by the International Labour Office in respect of the testing, thorough examination and inspection, as the case may be, of lifting appliances and items of loose gear.

6.3.5. Safe Working Load

- 6.3.5.1 Every lifting appliance (other than a ship's derrick) having a single safe working load and every item of loose gear shall be clearly marked with its safe working load by stamping or, where this is impracticable, by other suitable means.
- 6.3.5.2 Every lifting appliance (other than a ship's derrick) having more than one safe working load shall be fitted with effective means of enabling the driver to determine the safe working load under each condition of use.
- 6.3.5.3 Every ship's derrick (other than a derrick crane) shall be clearly marked with the safe working loads applying when the derrick is used,
 - a. in single purchase,
 - b. with a lower cargo block,
 - c. in union purchase in all possible block positions.
- 6.3.5.4 Loads shall not be raised or lowered unless slung or otherwise attached to the lifting appliance in a safe manner.

6.3.6 Rigging Plan

Every ship shall carry rigging plans and any other relevant information necessary to permit the safe rigging of its derricks and accessory gear.

6.3.7 Pallets

6.3.7.1 Pallets and similar devices for containing or supporting loads shall be of sound construction, of adequate strength and free from visible defects liable to affect their safe use.

- 6.3.7.2 Disposable pallets and similar disposable devices should :
 - > be clearly marked or labeled to indicate that they are disposable.
 - > not be used unless they are free from defects liable to affect their safe use

6.4 DANGEROUS CARGO HANDLING

- 6.4.1 Any dangerous cargo shall be packed, marked and labeled, handled, stored and stowed in accordance with the relevant requirements of international regulations (i.e., IMO)applying to the transport of dangerous goods by water and those dealing specifically with the handling of dangerous goods in ports (IMDG Code).
- 6.4.2 Dangerous substances shall not be handled, stored or stowed unless they are packed and marked and labeled in compliance with IMDG code and other applicable international regulations for the transport of such substances.
- 6.4.3 If receptacles or containers of dangerous substances are broken or damaged to a dangerous extent, dock work, other than that necessary to eliminate danger, shall be stopped in the area concerned and the workers removed to a safe place until the danger has been eliminated.
- 6.4.4 Adequate measures shall be taken to prevent exposure of workers to toxic or harmful substances or agents, or oxygen-deficient or flammable atmospheres.
- 6.4.5 Where workers are required to enter any confined space in which toxic or harmful substances are liable to be present or in which there is liable to be an oxygen deficiency, adequate measures shall be taken to prevent accidents or injury to health.
- 6.4.6 Dangerous substances should only be handled, stored or stowed under the supervision of a responsible person.
- 6.4.7 When dangerous substances are to be handled, stored or stowed, the workers concerned should be given adequate information as to the special precautions to be observed, including action to be taken in the event of a spillage or accidental escape from containment.

6.5 NOISE AT WORKPLACE

Suitable precautions shall be taken to protect workers against the harmful effects of excessive noise at the workplace.

6.5.1 Control of Noise

For the purpose of this regulation, the personnel at work will be aware of action levels that exist for the control of noise at work. The action levels are as follows:-

- 6.5.1.1 First Action Level means a daily personal noise exposure of 85 dB(A) based on an 8 hour time weighted average period per day.
- 6.5.1.2 Second Action Level means a daily personal noise exposure of 90 dB(A) based on an 8 hour time weighted average per day.
- 6.5.1.3 Peak Action Level means a level of peak sound pressure of 200 pascals.

6.5.2 General Requirements

The Employer, port operators and contractors will ensure that where their workers are exposed to the first action level or above or the peak action level or above a noise assessment is carried out by a trained and experienced person. The assessment must identify the workers at risk and the noise levels to which those workers are exposed to. The Employer, port operators and contractors will ensure that the risk of damage to the hearing of his workers from exposure to noise is reduced to the lowest level reasonably practicable.

6.5.3 Reduction of Noise Exposure

The Employer, port operators and contractors will ensure that where his workers are exposed to the second action level or above or the peak action level or above he must reduce exposure to noise of these workers so far as is reasonably practicable. Reduction of exposure is to be by any means other that the use of personal ear protectors.

6.5.4 Use of Personal Ear Protection

The Employer, port operators and contractors is to rely on the use personal ear protection only after the measures taken to control noise have failed to reduce the workers exposure to noise to below the first action level or below the peak action level. Where a worker is exposed to noise in excess of the first action level but below the second action level they are to ensure that personal ear protection is provided at the request of the workers. Where a worker is exposed to noise levels in excess of the second action level or in excess of the peak action level thet they must provide personal ear protection to every worker and the wearing of the personal ear protection must be enforced.

6.5.5 Hearing Protection Zones

Any area or areas, where workers may be exposed to noise levels in excess of the second action level or in excess of the peak action level, are clearly identified. The areas are to marked as personal ear protection zones and the responsible person shall enforce the wearing of personal ear protection in these zones.

6.6 USE OF PERSONAL PROTECTIVE EQUIPMENT

6.6.1 Where adequate protection against risks of accident or injury to health cannot be ensured by other means, workers shall be provided with and shall be required to make proper use of such personal protective equipment and protective clothing as is reasonably required for the performance of their work.

6.6.2 Personal protective equipment and protective clothing shall be provided by the employer.

6.6.3 Workers shall be required to take care of that personal protective equipment and protective clothing.

6.7 EMERGENCY RESPONSE

In case of accident, adequate facilities, including trained personnel, shall be readily available for the rescue of any person in danger, for the provision of first aid and for the removal of injured persons in so far as is reasonably practicable without further endangering them.

6.8 BASIC SAFETY INDUCTION

6.8.1 No worker shall be allowed to work in port premises unless he has been given adequate instruction or training as to the potential risks attaching to his work and the main precautions to be taken.

6.8.2 With a view to preventing occupational accidents and diseases, workers should be given adequate instruction or training in safe working procedures, occupational hygiene and, where necessary, first-aid procedures and the safe operation of cargo-handling appliances.

6.9 ACCIDENT REPORTING

6.9.1 To assist in the prevention of occupational accidents and diseases, measures shall be taken to ensure that they are reported to the competent Department and, where necessary, investigated. Accidents are reported to Emergency control centre (ECC) immediately by telephone on 04 8833111. This number is available 24 hours a day 7 days a week. (See Section 2.28)

- 6.9.2 The port operator ,contractor shall report and investigate all work related HS&E incidents to EHS as per the PCFC requirements. Incident reports and investigations shall be reviewed by the EHS representative.
- 6.9.3 In the event of any accident on board vessels in addition to the above, the master must do everything within his power to keep the situation under control, and as soon as practicable, submit to the port management a full written report duly signed.

6.10 INVESTIGATION OF ACCIDENTS

6.10.1 All accidents should be investigated with a view to determining their cause and to determining the action that should be taken to prevent any similar accident in the future.

6.10.2 The formality and depth of the investigation should be proportional to the severity or potential severity of the accident. Often, only a minor change in circumstances can make the difference between an accident resulting in no injury, very minor injury, or a fatality. It should not be necessary to 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.

- 6.10.3 The names of witnesses should be recorded and any relevant photographs taken should be identified, captioned and dated.
- 6.10.4 The investigation should consider all the relevant evidence. This may include the site where the incident occurs, plant, the type of cargo being handled or substances being used, systems of work, responsibilities and people involved, including their physical or mental condition, training and competencies.
- 6.10.5 It is important to investigate not only the *direct* cause of an accident, but also to determine the *underlying* cause or causes, which are often the real cause of an accident.

6.11 WELFARE FACILITIES

A sufficient number of adequate and suitable sanitary and washing facilities shall be provided and properly maintained at each dock, wherever practicable within a reasonable distance of the workplace.

The contractor is responsible for ensuring the welfare of all workers under his control. As a minimum the contractor must ensure adequate welfare facilities as detailed in DM / PCFC Health & Safety regulations and standards. The port users including contractor must make arrangements to ensure that the facilities provided are properly maintained and cleaned on at least a daily basis.

6.11.1 Drinking Water

The port operators, users and contractors must ensure that there is an adequate supply of drinking water supplied close to the work site. During the summer months this supply of water must be chilled. During the period 15^{th} June – 15^{th} September the they must also ensure that ISOTONIC solutions are provided to the workforce in order to prevent dehydration. The use of salt tablets is prohibited.

6.12 SPECIAL EHS REQUIREMENTS AT TANKER BERTHS

6.12.1 Stores, Provisions and Spare Parts

6.12.1.1 Stores and provisions, other than hand carried provisions are NOT allowed to be taken during the loading of liquid cargoes at tanker berths.

6.12.1.2 Barges or crafts carrying stores or spare parts are NOT allowed alongside any oil & chemical & Gas tanker when the loading arms are connected. Delivery of stores and/or spare parts by barge or boat should be arranged for the period before or after loading. Arrangements shall be made through the Agent.

6.12.2 Surge Pressure Precautions at Tanker berths

Surge pressure shall be minimized at all times, by sensible valve operation during cargo transfer and tank changeover periods, and regular communications and updates between the Vessel and the Terminal.

6.12.3 Tank Lids and Connections, Cargo and Bunker

6.12.3.1 Cargo and bunker tank lids must be closed and gas tight at all times.

6.12.3.2 Cargo and bunker connections not in use must be blanked and gas tight with all holes bolted.

6.12.4 Tank Cleaning, Gas Freeing and Purging

Tank Cleaning, inerting, purging or gas freeing within the Port Area is strictly prohibited without the written permission of the Port Management with the exception of associated and agreed routine procedures pertaining to the tanker operations.

6.12.5 Sighting and Ullage Ports

Closed loading operations shall be maintained at all times at tanker berths.

6.12.6 Sea and Overboard Valves

6.12.6.1 Overboard discharge valves on the bilge and cargo systems shall be firmly closed and locked. Where the indicated valves are hydraulically powered then a suitable means of preventing accidental operation shall be arranged.

- 6.12.6.2 During the Vessel's stay in the Port all overboard discharge valves shall be monitored to ensure that no polluting substances are released.
- 6.12.6.3 Water discharges (e.g. cooling water) & deballast water shall not be directed onto or over the jetty or dolphins. Where this cannot be achieved mechanically then suitable baffle boards must be rigged to the satisfaction of the Port Management.

6.13 BALLAST DISCHARGE AND POLLUTION PREVENTION

The waters in and around the Port are renowned for their abundant marine life and tourism. Any pollution affecting the well-being of the area is looked upon as extremely serious and will incur heavy penalties, in addition to any clean up costs.

Masters shall ensure the following conditions:-

- 6.13.1 Only the discharge of "clean" ballast from Segregated Ballast Tanks (SBT) is permitted.
- 6.13.2 All ballast water, other than that contained within SBT, shall be retained onboard.
- 6.13.3 If required, Ballast water for discharge at this Port will be sampled and analyzed by the Port Management before discharge is allowed. Should any analysis indicate that the quality of the ballast water does not conform to that required within the "Environmental Guidelines" as published and amended from time to time by the PCFC, then appropriate action will be pursued.

Substance	Units	Max. allowable
Ammonia	mg/l	3
Biochemical Oxygen Demand	mg/l	75
Chemical Oxygen Demand	mg/l	470
Floatable Oil & Grease	mg/l	Nil
PH	рН	6 – 9
Total Suspended Solids	mg/l	35
Total Oil	mg/l	15
Total Organic Carbon	mg/l	150

A table showing the acceptable criteria for 'clean ballast' is given below :-

6.13.4 In line with the ROPME Protocols **any** water discharged into Arabian Gulf should be free from substances that:

- a) Settle or form objectionable deposits.
- b) Floats as debris, scum, oil, or other matter to form nuisance.
- c) Produce objectionable colour, odour, or turbidity.

- d) Result in impact on the adjacent open Gulf water quality and injure or are toxic or produce adverse physiological responses in humans, marine animals or plants.
- 6.13.5 Masters are strongly encouraged to take all necessary precautions to minimize and control the introduction of unwanted aquatic organisms and pathogens from the Vessel's ballast water by adopting a ballast water exchange and sediment removal procedures in accordance with the relevant IMO Guidelines and Recommendations.
- 6.13.6 Pollution prevention
- A) In the event that pollution, on the land or within the waters of the Port Limits occurs, regardless of cause or origin, the person in charge or responsible for the operation, works or location where such pollution occurs, shall **immediately** report the incident via the Port Control by the most expeditious means. **Inform Port Control by VHF radio Ch:69 or by Tel:8835251.**
- B) Immediate action must be taken to stop or minimize further pollution and contain or clean up any spillage of oil on, the Vessel's deck, or shore areas. Failure to report a pollution incident is a serious offense against the Regulations and persons found contravening this requirement will be liable to heavy fines and prosecution in UAE courts.

6.14 APPROVAL OF SHIP REPAIR AND SURVEY COMPANIES

6.14.1 No person or company shall provide ship repair , ship survey services without having obtained an approval from the port management.

- 6.14.2 The approval shall only be issued by the Harbour Master.
- 6.14.3 The approval shall be renewed annually y not exceeding maximum of a month from the date of expiry of the approval.

6.15 ROAD SAFETY REGULATIONS

6.15.1 Restriction on securing of loads

- 6.15.1.1 The port management may require limitation of a load carried on any vehicle, or any towed trailer, if the load is, or is liable to become a danger or obstruction or inconvenience to persons and vehicles using the port premises which includes roads as well.
- 6.15.1.2 No vehicle or trailer shall carry a load with dimension in excess of the limitations imposed by the government traffic regulations, except when an exception permit has been obtained from the relevant authorities.
- 6.15.1.3 Loads projecting beyond the overall dimensions of the vehicle or trailer shall be marked where they protrude with the red marker or with a red flag by day and with red lights at night.
- 6.15.1.4 No vehicle shall be loaded with a weight greater than the rated weight capacity as specified by the manufacturer or in excess of limits imposed by the government traffic regulations.
- 6.15.1.5 All loads shall be properly stacked and secured to the satisfaction of the port management before vehicles are allowed to proceed through the port.

6.15.1.6 The owner or hirer of a vehicle shall be held responsible for any loss of life, limb or property or damage arising from improper securing of cargo on his vehicle.

6.15.2 Abnormal Loads

6.15.2.1 Owners of abnormal loads which require special permits from the traffic department for transportation by road, as prescribed by the government traffic regulations, when demanded by the port management, must provide escort vehicles traveling in front of and at the rear of the load using amber or red flashing lights or using full headlights (in daylight only), in conjunction with hazard warning flashers.

6.15.2.2 Vehicles carrying abnormal loads must be routed according to the specific instruction of the port management, that is , Security department in this case. Requisition to the port management must be made well in advance of any expected movement of an abnormal load within the port.

6.15.3 Transport of containers

No vehicle or trailer shall transport any container within the port facilities unless the container is properly secured twist locks, designed to transport containers by land.

6.15.4 Refueling of vehicles

Transport vehicles shall not be refueled inside the port. If it is necessary, then an approval is required from port management to carry out this activity provided that appropriate safety equipments is available in the location and appropriate safety precautions are strictly followed.

6.15.5 Removal of goods falling from vehicles

When some cargo of a vehicle fall down on a road of the port, the vehicle driver shall stop their vehicle and report the matter to the Security department and relevant authorities. The vehicle driver shall maintain the safety of others in the area by removing and reloading the spillage in safe manner till other assistance arrives.

6.15.6 Reporting of Road accidents

All drivers of vehicles involved in an accident at the port whereby injury or property damages are caused, shall stop their vehicles and report the matter to the Security Department and concerned authority namely traffic police immediately.

6.16 ENTERING AND WORKING IN ENCLOSED OR CONFINED SPACES

6.16.1 General provisions:

6.16.1.1 A confined space may be considered as an enclosed or partially enclosed space, where there is little or no natural ventilation which may be of any shape, may be above or below ground, and does not necessarily have to be small in volume having following main characteristics of confined space:

- an enclosed or partially enclosed space, may be above or bellow ground, any shape or size,
- access may be restricted,
- likely to be poor ventilation,
- hazardous gases, vapours, mists, fumes or dust may be present or may be produced in the space or may flow into space,
- atmosphere may be deficient in Oxygen or enriched with Oxygen,
- space may be hot, humid or dark,
- engulfment or entrapment hazards may be exist,
- normal industrial hazards may be intensified,
- mechanical, electrical or radiation hazards may present,
- fire protection flooding system may be installed.

All enclosed or confined spaces should be unsafe for entry until proven otherwise.

- 6.16.1.2 If there is unexpected reduction in or loss ventilation, in spaces which are usually ventilated whatever means, then those spaces should also considered as dangerous.
- 6.16.1.3 Any enclosed or confined space may have an atmosphere deficient in Oxygen, and/or contain flammable or toxic fumes, gases or vapours, thus presenting a major risk to health or life for anyone entering it or the area in which an unsafe atmosphere is present or unsafe atmosphere can arise by virtue of its conditions/situation & actions.
- 6.16.1.4 Such enclosed or confined spaces should not be entered except upon the explicit instruction of the master or the responsible officer. If a deficiency of Oxygen or the presence of toxic gases, vapours or fumes is suspected in any space, then that space should be considered dangerous.
- 6.16.1.5 The ships & shore-based crew should be drilled periodically in confined spaces rescue and medical first aid.
- 6.16.1.6 No body should be allowed to enter in to confined space without a **work permit.**
- 6.16.1.7 Equipment producing gases or exhaust gases shall not be allowed to enter/use in confined space.
- 6.16.1.8 All contractors & port users/operators shall ensure their employees are aware of and can recognize the hazards of confined spaces and enclosed spaces. They shall also make sure their employees know entry and work procedures as well as emergency and rescue procedures for the specific confined spaces and enclosed spaces with dangerous atmospheres where they may work either in facilities or on ships. They shall ensure that their employees obey confined space signs and tags.

6.16.2 Precautions on entering dangerous spaces:

6.16.2.1 Before a space is entered, the following precautions should be taken, as appropriate, to make it safe for entry without the need for breathing apparatus, and to ensure that it remains safe whilst seafarers/workers are inside:

- a) PCFC-DPA-approved surveyor should make an assessment of the space and a responsible officer should be appointed to take charge of the operation.
- b) The potential hazards should be identified
- c) The space should be prepared and secured for entry.
- d) The atmosphere should be tested for human worthiness.
- e) A work permit system should be used.
- f) Entry procedures shall be established and followed.
- g) Continuous ventilation should be maintained throughout.
- h) Appropriate warning notices should be placed on relevant controls or equipment.
- 6.16.2.2 Additional precautions, including the use of breathing apparatus, personal protective equipment, should be taken where the above precautions have been followed and an unsafe atmosphere has been established.
- 6.16.2.3 No one should enter a dangerous space to attempt a rescue without first having called for assistance and then having donned a breathing apparatus. Even then entry should not be made until assistance arrives.

6.16.3 Duties and responsibilities of surveyor and of responsible officer

6.16.3.1 The designated DPA approved surveyor/ship's officer should carryout risk assessment. Risk assessment provides a sound basis for the improvement of safety. It should cover all work tasks and hazards in the workplace and allows hazards to be assessed to see how harmful they are. The designated DPA approved surveyor/ship's officer should be capable of making an of likelihood of a dangerous atmosphere present or arising subsequently in a space. The person should have sufficient theoretical knowledge and practical experience of the hazards that might be met in order to be able to assess whether .precautions are necessary. The assessment should include potential hazards, which might be met, and should take into account any dangers from neighbouring or unconnected space, as well as the work needing to be done in the space itself.

- 6.16.3.2 A responsible officer should be designated to charge of every operation where entry into potentially dangerous space is necessary.
- 6.16.3.3 The responsible officer must decide on the basis the surveyor's assessment the procedures, which must be followed for entry into the space.
- 6.16.3.4 If no risk to life or health is envisaged, and it is considered that conditions in the space will not change, then entry may be made. The space should be monitored as long as anyone is inside and at every re-entry after work breaks.

6.16.4 Testing the Atmosphere of Confined and Enclosed Spaces

- 6.16.4.1 The surveyor/ responsible officer who is trained for
 - Use and care of gas detection equipment
 - Limitations of gas detection equipment
 - Gas sampling procedures

- 6.16.4.1 Equipment should be properly calibrated before use. Testing of atmosphere should be carried out before entry and at regular intervals thereafter.
- 6.16.4.2 Testing of the atmosphere before entry should made by remote means. If not possible, the approved surveyor should ensure that all attempts have been made to reduce the danger posed by the atmosphere and only then should entry be made with additional precautions to safeguard health and life of the persons. Testing of the atmosphere should be carried out different levels, where appropriate.
- 6.16.4.3 All relevant parameters for human worthiness such as toxic vapours, explosive/ flammable gases and Oxygen deficiency should be tested with the help of suitable equipment and exact results should recorded.
- 6.16.4.4 Personal monitoring equipment should not be used as a means of determining whether a dangerous space is safe to enter.
- 6.16.4.5 In order to obtain a representative cross section of the compartment's atmosphere, samples should be taken from several depths as many opening as possible. Ventilation should be stopped for 30 minutes before the pre-entry atmosphere tests are taken. Human worthiness must be checked by measuring explosivity, toxicity and oxygen deficiency of the work site and in the vicinity.
- 6.16.4.6 Testing equipment /methods should be approved by recognized authorities and it should be calibrated before use.
- 6.16.4.7 **Testing of Flammable (Combustible) gases or Vapours:** The combustible gas indicator (sometimes called the explosimeter) detects the amount of flammable gas or vapour in the air. An instrument capable of providing an accurate reading at low concentrations should be used to judge whenever the atmosphere is safe. The meter is primarily intended to detect hydrocarbon gas concentrations in air UP TO A POINT WHERE THEY CAN SUSTAIN AN EXPLOSION. It will not measure flammable limits in an inerted atmosphere. For this secondary purpose, a special meter is used which measures combustible gases in inerted atmosphere.
- 6.16.4.8 In deciding whether the atmosphere is safe for entry, continuous **NIL** readings on an explosimeter are desirable.
- 6.16.4.9 Atmosphere can be considered safe where readings shows 0% of **LEL** and O-PPM toxic gases and are confirmed to be steady in conjunction with oxygen readings of 20.8% by volume. Readings should continue to be taken throughout the period that spaces are occupied. Inerted atmosphere can contain toxic gases.
- 6.16.4.10 **Testing of Toxic Gases/ Vapours:** Suspected toxic gases based on previous cargoes and the last cargo content should be tested for human worthiness prior to the entry to the confined spaces. Material safety Data Sheets (MSDS) of the cargoes should be referred to identify the toxic gases. In deciding whether the atmosphere is safe for entry, continuous **NIL** reading on meter or dry tubes is desirable without ventilation running. However, atmosphere can be considered safe where readings of much less than the **TLV** (threshold limit value) of the

chemical content/specific toxic contaminant depending of nature of previous content of the space.

- 6.16.4.11 **Testing of Oxygen deficiency:** A steady reading 20.8% oxygen by volume on an oxygen meter shall obtained before entry is permitted and regular tests performed in conjunction with continuous venting.
- 6.16.4.12 **PCFC** Work Permit must be used.

6.16.5 Validity of Work Permit

6.16.5.1 Procedures, arrangements and precautions should be followed as specified in the work permit.

6.16.5.2 Gas Free Certificate issued by DPA approved surveyor has a maximum validity of three (3) days from the date of issue, after which the certificates will automatically expire. Notwithstanding the 3-day validity period, any change in the conditions or state of the examined parts of the vessel due to activities taken place subsequent to the examination, including but not limited to re-ballasting of tanks, pumping of bunkers, and steaming of pipelines or valves, shall invalidate the Certificate. Should the Certificate expire or any change in the condition occurred, it is necessary to re-inspect the vessel and a new Certificate issued thereupon. It is the responsibility of the Master of the vessel to monitor the expiry date and the condition and should the Certificate expire or any change occur, it is the responsibility of the vessel to inform the DPA approved surveyor through the vessel's agent in order that a further inspection be carried out. However responsible officer should monitor, test and record the confined/ enclosed space atmosphere at regular interval, preferably every hour to ensure that the condition is safe to continue the work.

6.16.5.3 Everyone should leave the space on expiry of a work permit, and the entrance should be closed or otherwise secured to prevent re-entry, or declared safe for normal entry when it is no longer dangerous.

6.16.5.4 No one should enter in any confined space without an approved and current valid work permit.

6.16.6 Safety Arrangements during Entry

6.16.6.1 The space should be continuously ventilated whilst occupied and during temporary breaks. All persons in the space should leave it immediately should the ventilation system fail or if unforeseen difficulties or hazards occur

- 6.16.6.2 Whilst the space is occupied the atmosphere should be tested periodically and recorded. Should there be any deterioration in the conditions all persons should leave immediately.
- 6.16.6.3 A rescue harness should be worn to facilitate recovery in the event of an accident.
- 6.16.6.4 The general alarm should be sounded in the event of an emergency, so that immediate back up can be given to the rescue team.
- 6.16.6.5 In case of any dispute refer to EHS representatives and his advice shall be binding to all concerned.
- 6.16.6.6 Any additional precautions as required for the specific jobs/entry etc. should be considered to ensure safety, health and environment.

6.17 HEAT STRESS AT WORK

6.17.1 General Information

Heat stress is a significant occupational problem in this region. Heat stress in dependent on the environmental conditions and the physical activity being undertaken by the person. High temperature, high thermal radiation, high humidity, low air movement, high activity levels in the work place and the need to wear personal protective clothing, all combine to elevate the body temperature, resulting in heat cramps, heat exhaustion or heat stroke. The same degree of exposure may produce different effects depending upon the susceptibility of the person exposed. Dubai Occupational Health and Safety regulations Local Order 61 of 1991 requires the employer to ensure safe working environment in the workplace.

6.17.2 Measures to prevent Heat stress

- 6.17.2.1 Responsible person at worksite must look for early signs of heat stress, relieve workers and provide appropriate treatment.
- 6.17.2.2 Know which factors increase the risk of heat stress control the work environment.
- 6.17.2.3 Increase water consumption to replenish the water lost from sweating
- 6.17.2.4 Provide/take rest breaks depending upon conditions such as air temperature, sun exposure, radiating heat exposure and hard physical work.
- 6.17.2.5 An employer shall provide heat protective clothing and equipment, when possible, loose lightweight clothing which encourages heat to be released and covers most areas of the body.
- 6.17.2.6 An employer shall plan work schedules to help the employees to adapt to the heat for better acclimatization.
- 6.17.2.7 An employer shall not require/allow an employee who is physically unfit to work in hot environment.
- 6.17.2.8 An employer shall ensure adequate cool drinking water is available at each workplace. Sweet drinks such as canned soft drink should not be provided as these increase fluid loss.
- 6.17.2.9 An employer shall ensure adequate medical facilities are made available in case of medical emergencies due to heat stress.

6.18 CONTRACTOR'S EHS REQUIREMENTS FOR PORT ACTIVITIES

6.18.1 General Requirements

All Contractors shall ensure that the work is executed in the spirit of PCFC Policies and its adopted principles. Contractors should achieve the same or higher EHS Standards as those required internally by PCFC. Whenever two or more contractors undertake activities simultaneously at one workplace, they shall have the duty to collaborate, without prejudice to the responsibility of each contractor for the safety and health of his employees.

6.18.2 Application of EHS requirements to Sub-Contractors, Vendors/Third Parties

The Contractor shall ensure that any sub-contractors working on its behalf, complies with PCFC-EHS Standards, procedures and other requirements. It is the responsibility of each and every contractor working within the port premises to comply fully with all applicable federal, state and local regulations and laws. Furthermore the Contractor is responsible for implementing a verification system to check the implementation of EHS Standards in their Sub-contractors.

6.18.3 Roles and Responsibilities

Contractor management shall demonstrate its commitment to Health, Safety and Environmental protection. The Contractor shall at all times provide competent supervision for each individual. On-site supervisors shall ensure that all HS&E requirements for the work being carried out are satisfied. If the work is stopped due to such concerns, corrective action shall be sought before resuming work.

Contractors and labour/service providers should cooperate with Port Authorities and other bodies working in port areas to protect the safety and health of all persons who may be affected by their activities. In particular, they should ensure that:

- a) all workers they employ or supply are appropriately trained and competent to perform the work they are required to do in port areas;
- b) all such persons are aware of the particular hazards of the port areas in which they are to work, the hazards and precautions to be taken in connection with port work in general, and any local rules;
- c) all such persons are appropriately supervised;
- d) all plant and equipment that they supply or use is of sound construction and properly maintained in a safe condition;
- e) they supply such information as is necessary to others who may be affected by their activities;
- f) they cooperate with the port authority, other employers and any other relevant bodies.

6.18.4 Training & Personnel Competency

1. The Contractor is responsible for ensuring that all personnel including Sub Contractors are competent, provided with sufficient skills and HS&E training to enable them to work in a safe, healthy and environmentally responsible manner.

2. All personnel, including sub-contractors shall have received formal EHS induction training prior to commencing work within Port premises. The Contractor shall complement formal training by "on-the-job" training when required.

6.18.5 Reporting of Incidents

The Contractor shall report and investigate all work related HS&E incidents to EHS as per the PCFC requirements (See Section 2.28). Incident reports and investigations shall be reviewed by the EHS representative.

<u>SECTION – 7</u> <u>EHS : DEVELOPMENT & CONSTRUCTION REQUIREMENTS</u>

7.1 EHS-NOC (for Building Permit):

From the year 2006, all developers are required to obtain an EHS-NOC (for Building Permit) from EHS prior to applying for a Building Permit from the Civil Engineering Department. The purpose of this process is to ensure that the Client's/End-user's facilities comply with the required Health, Safety & Environment and Fire Protection, Fire Prevention & Fire /Emergency Control Standards as defined by Environment Health & Safety (EHS) in the design stage of the project. Any developer who intends to construct/erect/modify/alter/add a building/ facility, carry out any civil/mechanical works such as Building, roads, earthworks, Plot leveling, fencing or pipelines, tanks, install machinery, equipment, racking systems etc., shall follow the required procedure **(H,S&F Guidelines)** to obtain the NOC prior to applying for the Building Permit (BP) from CED.

7.2 Procedure for Construction Works (Refer CED Regulations)

Construction Procedure shall be in line with the requirements of Civil Engineering Department (CED) Building Regulations & Design Guidelines. However, after mobilization and prior to start of construction activities, the contractor shall invite PCFC-EHS for site inspection and obtain a Certificate of Conformity (COC-I) by submitting the "Contractor's Environment, Health & Safety (EHS) Form I" to the Competent Department. Any works that commence prior to obtaining the same could result in sanctions/penalties.

7.3 Certificates of Conformity

The developers shall be fully aware of the procedures/requirements in regard to submission of EHS Forms I & II in regard to obtaining the Certificates of Conformity (I & II) from EHS to ensure Construction Safety (See H,S&F Guidelines).

7.4 Procedure for Facility Completion Certificate (Refer CED Regulations)

Upon completion of the project, the consultant shall apply to EHS for EHS-NOC for BCC prior to approaching CED for a **BUILDING COMPLETION CERTIFICATE (BCC)**. However, any failure to reply/comply/clarify earlier issued EHS-NOC comments may result in penalties/ rejection of the EHS-NOC for BCC. EHS shall not be involved in issuing BCC for DEWA Purpose and has no objection for obtaining Water & Electricity for testing/commissioning purposes. However, facilities shall not be occupied on the basis of such Certificates from CED, unless EHS Approval/ NOC is obtained. **(Refer H,S&F Guidelines)**

7.5 Permit to conduct Operations

After obtaining a BUILDING COMPLETION CERTIFICATE and completing the installation of machinery (with approvals from EHS), the client/licensee shall then apply/invite immediately to EHS for obtaining an OPERATION FITNESS CERTIFICATE. The facility shall not be operated unless an **OPERATION FITNESS CERTIFICATE** is obtained from the EHS. (Refer ECRR, 2005)

7.6 POWERS OF THE AUTHORITY

- 7.6.1 At the discretion of the Authority, the EHS-NOC for BP may be cancelled/suspended if:
 - a) Work was carried out in contravention of the conditions of the **EHS-NOC for BP** or of any regulations issued by the Authority.
 - b) It is subsequently revealed that the **EHS-NOC for BP** was issued on the basis of erroneous or inadequate information supplied by the developer or his agent.
- 7.6.2 **EHS-NOCs** will not be withheld unreasonably, but the Authority shall have the discretionary power, to attach such special conditions thereto.
- 7.6.3 The Authority is empowered to change, amend, add, replace and/or update the regulations without notice. It is the developer's responsibility to obtain updated regulations. it is the responsibility of the developer/licensee to apply the up-to-date regulations and Free Zone Rules, etc. that may supersede ones mentioned in these regulations.
- 7.6.4 The Authority reserves the right to levy fines for breach of regulations and to suspend a consultant or a contractor for non-compliance with the regulations.

7.7 RESPONSIBILITIES AND DISPUTES

7.7.1 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 the Authority or their representatives. The client, developer and his agents shall remain entirely responsible for all errors in the design and execution of the project and for the stability and safety of construction during the progress of the works and after completion.

7.7.2 All complaints and disputes concerning **EHS-NOC** and the approvals in this regard shall be referred to EHS Senior Management. In case of any difficulty or issue concerning EHS-Fire Department, the matter shall be, in the first instance, directly reported to Vice President/Chief Fire Officer: EHS –Fire Department or his Deputy. It shall be noted however that the Competent Department will not arbitrate for financial/contractual disputes between clients/developers and their consultants or contractors. All such disputes shall be settled through the Dubai Civil Courts.

7.8. SITE AND SERVICES

- 7.8.1 Prior to seeking EHS-NOC for BP from EHS, the developer shall obtain the following approvals :
 - i. Concept Design approval from CED/ NAKHEEL wherever applicable.

ii. Approval from CED/Property Department on % of area to be developed (if exceeding standard JAFZA/CED norms)

iii. Approvals from Master Designer /Infrastructure Consultant/Dubai Municipality (where applicable) on connection of house drainage to Drainage networks

- iv. Connection to Fire main Network System, if available.
- 7.8.2 The developer shall ensure :

- Unimpeded road access not less than 5.5 m wide around the Warehouse, Industrial/factory buildings and facilities in Free Zone area. Roads shall be of sufficient standard for use by fire tenders (any septic tank, manhole located in this road shall be of heavy duty) and shall be adequately illuminated. (Note : for other facilities, CED regulations shall be referred).
- ii. Sewerage and water services to all habitable buildings.
- iii. Adequate fire protection & fighting facilities.
- iv. Uncontaminated surface water drainage and disposal in line with CED requirements
- v. Suitable Perimeter fence/wall to the leased area (as per CED requirements)
- vi. Adequate sanitary and parking facilities within the plot.
- vii. Suitable waste collection, treatment, re-cycling and disposal facilities.

viii. Compliance with Environmental Rules & Requirements, Health & Safety Regulations, Environmental Guidelines, Health & Safety Guidelines, Food Establishment Guidelines, relevant local/federal, Dubai Municipality Regulations & Guidelines wherever applicable to the project.

7.9. WATER SUPPLY AND SANITARY DRAINAGE

- 1. All tanks for reception or disposal of sewage from any building shall be adequately vented and impervious to liquid either internally or externally.
- 2. Drains and sewers must be of durable material and construction and watertight under all conditions. The internal diameter of any soil drain shall not be less than 100 mm.
- 3. Drains shall be laid in straight lines between changes of direction or gradient. The Maximum distance between inspection chambers shall be 30 m. Inspection chambers shall be provided at every point of change of direction. Top inspection chambers shall be adequately vented to fresh air. Any soil ventilation pipe within 5 m (measured horizontally) from any window shall extend to not less than 1 m above the window head.
- 4. All installations shall be subject to testing in accordance with appropriate Regulations.
- 5. Building drainage shall be designed and constructed in accordance with the requirements of BS 8301 or an equivalent standard approved by the Authority.
- 6. Soakaways are not permitted in the PCFC areas of jurisdiction. Holding /Septic Tanks of minimum 7 days holding (capacity minimum 100 lts./person/shift for 7 days) with provision of early warning alarm system with beacon light and buzzer and Breaching pipe for pumping out the tank shall normally required to be provided. The tank shall not be located in the 5.5m set-back/vehicular access area. If located in this area, the Road and tank construction shall be of sufficient standard for use of road by fire tenders, heavy vehicles and manhole shall be of heavy duty type.
- 7. To prevent overflowing of the waste water holding/septic tank, level indicator with warning light, buzzer and Breaching pipe for pumping out shall be provided.
- 8. Design and installation of small sewage treatment plants shall comply with BS 6297 or an equivalent standard approved by the Authority.

- 9. Water supply installations shall comply with relevant British Standards or an equivalent standard approved by the Authority and the requirements of DEWA Water Division and any house connection charges shall be paid by the client/developer.
- 10. Water storage tanks, to relevant British Standards or an equivalent standard approved by the Authority, shall be provided with a minimum capacity of one day's storage and additional storage required for fire fighting systems in accordance with EHS: Fire department's requirements.
- 11. Wherever there is a sewage network, the developer is required to connect into it, the charges for which will be according to the tariff available with EHS department (see also sec 7.4 of Free Zone Rules). These charges may be reviewed from time to time and the developer is advised to contact EHS department to obtain the latest tariff. In case such network is not available, the developer is required to construct a holding tank. (Refer to Environmental Control Rules and Requirements,
- 12. Provision for future connection to drainage network system shall be provided. Where connection of facility drainage is done by the infrastructure consultant/contractor/others, the submissions shall include a detailed note from such consultants/ contractors on the provision of infrastructure drainage/sewerage/effluent plans.

7.10 INDUSTRIAL DRAINAGE

- Any lessee/ client that has such wastewater should discuss his treatment, recycling, re-use, recovery (R-R-R) and disposal options prior to any construction works (ideally at the time of application for establishment of the project/company in the Business Unit)
- As per EHS Policy, no wastewater is recommended for off-site disposal and recycling, re-use, recovery (R-R-R) methods should be adopted along with suitable wastewater treatment practices. Direct disposal of Industrial waste to DM facilities without pre-treatment is not permitted.
- 3. A proper holding tank with liquid tight liner (preferably 2mm HDPE liner) of suitable capacity (*minimum 3 days capacity*). shall be provided for the collection/storage of any industrial wastewater generated from the operations.
- 4. Developers are required to have an industrial waste system within their plot separate from the domestic waste/sewage system. No drains from industrial processes will be allowed to discharge into the soakaway, storm water drainage, sea, harbor or the Authority's drainage network without treatment to standards acceptable to the Authority (refer to Environmental Control Rules & Requirements).
- 5. The developer will have to pay a one-time connection charge and according to EHS tariff for the effluent discharged into the Authority lines (see Environmental Control Rules & Requirements). These charges may be reviewed from time to time and the developer is advised to contact EHS department to obtain the latest tariff.
- 6. Proper spillage collection facility for the spillages, which could occur in the liquid chemical storage/production area should be provided. Open drain channels are not permitted and all drains shall be fully covered/closed.

- 7. Fire water drainage/spillage collection tank fitted with flame arrestors shall be provided for chemical/paint storage rooms/warehouses.
- 8. The drainage networks for industrial shall always be separated from the domestic drainage.
- 9. Drainage drawings for extensions/modifications shall include existing drainage networks.
- 10. The A/C drains to be discharged into a properly designed soak pit or domestic drainage network.

7.11 RAINWATER DRAINAGE

- Rainwater is not permitted to be discharged into the sanitary drainage system (septic tank) and Authority's drainage network system (where existing), adjacent plot or industrial drainage collection system.
- 2. All uncontaminated rainwater shall be either drained into a specially constructed soakaway or into the approach road, where suitable drainage provisions are available.
- 3. For further requirements, section 21.4 of Civil Engg. Department, "Building Regulations & Design Guidelines" Edition 2006 shall be referred.

7.12 FENCING & PLOT LEVELING

- 1. The developer should provide perimeter fencing to define the boundary of the property and to provide the degree of security that is consistent with the operations proposed. (For further detail please refer Section 8 of Civil Engg. Department, Building Regulations & Designed Guidelines).
- 2. In particular circumstances, the Authority may insist that the fence be covered with nylon fabric/tilda net. In such cases, the fence design shall be substantiated with calculations.
- 3. Fencing of open/empty plot for storage/operation activities without proper building structures is not permitted. However, where it is necessitate the Authority may decide and permit for open yard storage in special cases e.g. storing Steel Coils/materials and Heavy Earthmoving vehicles/ equipment, Trucks and cars etc. However, this will be permitted with construction of Sanitary Block with Toilet, Pantry and Messing Room for the employees.
- 4. The open plot storage yard for Heavy machine/equipment, Steel material, Building Material and Vehicles etc. shall be hard paved with suitable material such as Asphalt, Interlocking tiles, concrete etc. to ensure safety of vehicles in the area and prevent dust generation during operations.
- 5. Inlet road from the plot shall be paved with interlocking tiles.

7.13 VENTILATION AND AIR CONDITIONING

Design and installation of all ventilation and air conditioning systems for type of buildings shall be in accordance with current guidelines of ASHRAE standards (American Society of Heating, Refrigeration and Air conditioning Engineers). The purpose is to limit the accumulation of smoke, fumes, vapors, heat and pollutants which originate in the building and which would otherwise become a health hazard and to provide comfortable and safe working environment for the occupants.

1. Proper extraction/filtration systems with hood & ducting shall be provided for airborne emissions from the laboratory/kitchen/machine/operations/chemical manufacturing/processing areas. The

extraction/filtration ducting shall extend to a height of not less than 3 mts. above the roof ridge with appropriate sampling/access points. The efficiency of the extraction/ filtration system shall be assessed during drawing review & Operation Fitness Inspections of the project.

- 2. AC Ventilation shall be provided for the workers messing/dining/rest room in the Industrial/warehouse/factory Building and Security Guard Room.
- 3. For further requirements, Section 21.6 of Civil Engg. Department, "Building Regulations & Design Guidelines" Edition 2006, shall be referred and complied.

7.14 MESS AND KITCHEN:

- A mess, pantry and Kitchen (where applicable) shall be constructed of fire resisting materials and comply with standards required by the Authority. However, note that the provision of kitchen/cooking is not permitted in the Industrial, Warehouse and Factory Building (including offices in the same buildings). Also Refer EHS - Food Establishment Guidelines
- Floors and walls shall be impervious to moisture and capable of being cleaned by washing down.
 Floors shall be hard-surfaced, non-absorbent & adequately drained. They shall be constructed with waterproof, non-absorbent washable materials without fissures or crevices.
- 3. Walls shall be tiled to a height of 2.1m above floor level with glazed ceramic tiles and Floor with unglazed ceramic tiles. Internal walls shall be smooth, waterproof, resistant to fracture, light coloured and readily cleanable. (See also Food Establishment Guidelines for more details)
- 4. Drains from the mess, pantry and Kitchen (where applicable) shall incorporate grease and pea (rice) traps and interceptors.
- 5. Working surfaces for preparation of food are to be of stainless steel or other approved impervious material to facilitate cleaning and maintenance of hygienic conditions.
- 6. Mechanical extraction with filtration, exhaust hoods and fans shall be provided to all areas involving cooking activities i.e. stoves, gas rings, tandoors etc.
- 7. Gas pipes to cookers, rings etc., shall be laid in an approved manner with approved materials i.e. copper or steel tubing, permanent joints, minimum flexible hose and gas leak detection with auto shut off valve shall be provided.
- 8. Kitchens shall be fitted with recommended fire extinguishers as decided by the Fire Department.
- 9. Layout and construction details of any temporary canteen required during the period of construction shall be approved by the Authority (EHS- Food & Health).

7.15 REFUSE DISPOSAL

- The 5 x 5 mtr. Concreted area with three sides minimum 6" raised kerb-stone for placing the Domestic waste Garbage Collection Skip shall be provided within the plot at the industrial, warehouse and factory buildings. For special cases (e.g. Food establishments, further requirements may be advised depending on type/quantity of waste generated).
- 2. The area shall be directly accessible for safe maneuvering/access/ for the Garbage Collection Truck and shall be hard paved with suitable material.

- 3. If there is waste oil drums, empty paint or chemicals cans/drums or solid waste (other than domestic waste which requires special approval from the Authority's), the concreted storage area with 4 side raised curbstones away shall be provided.
- 4. Disposal of any kind of industrial waste (other than domestic waste) is not permitted to be disposed off in the garbage skip provided for the domestic waste.
- 5. For further requirements, section 19 of Civil Engg. Department, "Building Regulations & Design Guidelines" Edition 2006 shall be referred.

7.16 CHEMICAL LABORATORIES:

- Since all types of acids, alkalis and flammable materials are used in the laboratory, the schedule of finishes shall be selected with consideration to the Chemical Resistance, Mechanical Strength, Scratch Resistance, Non-absorption of materials, Heat Resistance, Ease of cleaning &, Decontamination, Life Expectancy, Ease of repair & maintenance and Prevention of static charge. Use of ceramic tiles is recommended as the most suitable material since it meets/withstands all the above requirements.
- 2. All electrical machine & lighting equipment/fixtures in the laboratory where there is chance of accumulation of flammable mixtures shall be of intrinsically safe.
- 3. An eye wash shower shall be provided in the Chemical laboratory.
- 4. All waste from the lab shall be treated as industrial waste and collected/disposed off as per EHS/DM Hazardous waste disposal procedures.

7.17 SWIMMING POOL

- Detailed for machine, Equipment, Filtration, Skimmer, Chlorination, Dosing, Backwash system and Safety Equipment with relevant drawings shall be submitted for obtaining approval for the Swimming Pools. Detail for the same shall be filled and submitted on the prescribed 'Swimming Pool Form' (See H,S&F Guidelines)
- 2. Adequate number of Lifebuoys shall be provided at the swimming pool.
- 3. A qualified lifeguard shall be available during the swimming pool operation timings.
- 4. Adequate number of Bathroom, Toilet & Changing Room separate for Male & Females shall be provided.
- 5. For further requirements, section 18 of Civil Engg. Department, "Building Regulations & Design Guidelines" Edition 2006 shall be referred.

7.18 LOADING/UNLOADING ARRANGEMENTS :

- 1. Proper loading/unloading bay or docking facility for loading/unloading of Containers & material etc. shall be provided at the Industrial/Warehouse/factory Buildings.
- For low level docking facility proper rain water collection/pumping out shall be provided. Wherever it is necessary, a proper Guardrails/handrails/kerb stone shall be provided. Wherever it is required a Dock Leveler shall be provided.

- 3. Suitable arrangements shall be made to prevent flooding during rain.
- 4. For loading/unloading operations only approved & Certified Lifting machine/equipment/tools/ tackles shall be used.
- 5. All Lifting machine/equipment shall drive/operated by authorized UAE license holder/operator only.

7.19 MACHINERY INSTALLATION

- 1. Machinery installation approval shall follow the Machinery Installation Procedure (Refer H,S&F Guidelines)
- 2. List of Machine/equipment with Floor Layout Plan and dimensions shall be submitted by the licensee/owner of the facility prior to installation. All machinery installation shall comply with applicable EHS Guidelines.
- 3. Full operational details and technical specifications with relevant drawings/brochure/catalogue etc. shall be submitted.
- 4. Minimum 1 mtr horizontal clearance from the walls/structure to the machine/equipment and minimum 2 mtrs. in-between the each machine/equipment shall be maintained. All service lines & 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.
- 5. All electrical operated machine/equipment shall be fitted with ELCB's and properly earth as per DEWA regulations.
- 6. All moving/rotating/dangerous parts of the machine/equipment shall be fully covered and fitted with proper safety guards.
- 7. All higher/elevated working platforms/area shall also fully covered/barricaded with suitable & rigid guardrail/handrails.
- 8. All conveyor belts shall be fully covered/enclosed to prevent dust generation/emission.
- 9. Wherever applicable full technical details/specifications/drawings for the installation of Boiler, Heating oven, Furnace, Pressure Vessels, Compressors and shall be submitted prior to installation.
- 10. Wherever applicable full technical details/specifications/drawings for the Dust Collection, Extraction/Filtrations system shall be submitted prior to installation.

7.20 LP GAS INSTALLATION

- Detailed engineering drawings for LP Gas Storage Cylinder/tanks for all type of installations including under ground, above ground, mounded, within or outside the building with storage capacity, location, piping, distribution, leak detection system, auto shut down valve, safe distances from the nearest building/property line and safety provisions etc. shall be submitted prior to installation.
- 2. The tank design & installation shall meet the requirement laid down in ASME-Boiler & Pressure Vessel Code, Section VIII, Division 1 & 2 , NFPA 58 and API 2510.

- For Bulk storage tanks, Risk Assessment Study from the PCFC approved RA Consultants (See H,S&f Guidelines) shall be carried out with prior approval of Scope of Work and submitted to EHS for their review/approval.
- 4. Hydro test certification from the approved Third party for the tanks shall be submitted.
- 5. For LP Gas facilities, section 21.5 of Civil Engg. Department, "Building Regulations & Design Guidelines" Edition 2006 shall also be referred.

7.21 PAINT/BLAST BOOTHS/ROOMS

- Spray painting operations/activities in the open area is not permitted. All spray painting operations shall be carried out in the fully covered and proper designed/constructed/approved painting booth/building. The construction material shall be of fire proof material and acceptable & approved by Authority. The walls & flooring shall be of smooth finish to prevent pocketing of paint residue and easily cleanable.
- 2. Detailed drawings for the paint/blast booth/building fitted with proper extraction/filtrations system shall be submitted to EHS for review/approval.
- 3. All electrical machine/equipment/lighting/fixtures etc. in the painting booth/building shall be of flame proof/ignition proof type.
- 4. Outlet from extraction/filtration system shall be taken out from the building, raised to minimum 3 meter from the roof ridge level and provided with sampling point with safe ladder/access.
- 5. 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 shall not be stored in the painting booth.
- 6. All electrical equipment/lighting/fixtures etc. in the paint store room shall be of intrinsically/ignition proof type.
- 7. Exhaust ventilation system @ 10-12 air changes/hour shall be provided for the Paint Store Room.
- 8. Proper Spillage/drainage collection provision shall be provided.
- 9. The construction material & storage racking/shelving in such areas etc. shall be of fire proof material acceptable & approved by Authority.

7.22 FUEL /CHEMICAL/ WASTEWATER TANK INSTALLATION

- 1. Detailed engineering drawings for Fuel Storage tanks for all type of installations including under ground, 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 prior to construction/installation.
- 2. All FRP/GRP/Plastic underground tanks shall be encased with concrete encasement. A proper leak detection system shall be installed to detect any leakage.
- 3. A minimum 2 mm thick HDPE liner shall be installed at the bottom of chemical/fuel/wastewater tanks to prevent leaks and EHS shall be invited for inspection after the same is laid.

- 4. For chemical/oils/wastewater tanks, concrete bund wall shall be provided. Bund wall calculation with 110% capacity of the tank, considering the free volume available after deduction for submerged tanks volume/piping/civil works in the bunded area.
- 5. All Pipe lines shall be marked and color coded and shall be checked during the inspection.
- 6. The tank design & installation shall meet the requirement laid down in API 650 and NFPA 30. The design verification report shall be submitted to EHS.
- 7. Wherever required, for Bulk storage tanks, Risk Assessment Study from the PCFC approved RA Consultant shall be carried out with prior approval of Scope of Work and submitted to EHS for their review/approval.
- 8. Hydro test certification from the approved Third party for the tanks shall be submitted.

8.23 HARDOUS STORAGE WAREHOUSE

- 1. Prior to construction, Risk Assessment Study report from the PCFC approved RA Consultant shall be carried out with prior approval of Scope of Work and submitted to EHS for the review/approval.
- 2. The flooring of the chemical storage warehouse shall be lined with chemical/ acid resistant coating.
- 3. All building/warehouse facilities for storing/handling/manufacturing chemicals/dangerous goods shall be provided with Emergency Eye Wash with Quick drench shower.
- 4. A de-contamination room with storage arrangement for Personal Protective Equipment shall be provided for chemicals/dangerous goods manufacturing/storing/handling facilities.
- 5. Adequate number of Wind socks at prominent locations shall be provided.
- 6. Adequate number of safety sign boards shall be provided.
- All RA Study recommendations shall be incorporated in the drawings and submitted to EHS for review/approval of the Hazardous Storage Warehouse/building for issuance of EHS-NOC for Building Permit.
- All RA study recommendations shall be implemented during the design/construction stage of the building. The same shall be checked/assessed during the Building Completion/Operation Fitness Inspection of the facility.

7.24 RADIOGRAPHY WORK AREAS

- 1. In Fabrication Industry, wherever radiography is required shall have proper storage pit for "Radio Isotopes" and Proper Radiography booth/enclosure for carrying out radiography.
- 2. Detailed drawings for storage pit & radiography booth enclosure with safe distance (Minimum distance shall not be less than 10 meters from other activity/facility/buildings & boundary/fence line of the premises) & provisions of beacon light, warning buzzer and appropriate safety sign board shall be submitted.
- 3. The design & construction materials of radiography enclosure shall be adequate to limit the radiation level outside the walls/enclosure. The design/thickness of the wall enclosure shall be checked/approved during the drawing submission of the radiography enclosure/booth.

7.25 CONSTRUCTION SITE FACILTIES

- 1. The client/consultant/contractor is responsible to maintain the safety standards of their site and shall provide suitable and adequate number of sanitary/welfare facilities for the construction workers at the site such as Toilet, Washbasin, Cool Drinking Water, Covered Rest Room for lunch.
- Port cabins or containers may be permitted for temporary use (site office, sanitary facilities etc.) only during the construction/development period of the project/ construction. The same are not permitted for regular operations by the client.
- 3. All such temporary port cabin/containers and waste/surplus material shall be removed prior to issuance of Building Completion Certificate.
- 4. The construction site shall be enclosed/barricaded from all sides with temporary fencing with strong & rigid material which shall be safe to withstand the wind load and acceptable to the Authority.
- 5. A refundable security deposit of AED 2,500/- for minor internal modification, Racking and Machinery installation etc., AED 5,000/- for Plot size upto 10,000 sq.mts. and AED 10,000/- for plot size bigger than 10,000 sq.mts. shall be paid by the Client/consultant/contractor. The refundable security deposit shall be paid prior to issuance of COC 1, to PCFC Finance Department, after endorsement from EHS.
- 6. Within 3 months of obtaining Building Completion Certificate, the refundable security deposit shall be claimed from EHS by respective client/consultant/contractor. Failure to claim the same within the 3 months period, may result in forfeiture of the security deposit.

7.26 GENERAL ENVIRONMENT, HEALTH AND SAFETY REQUIREMENTS.

- 1. Equipment & Car/vehicle washing shall be carried out in enclosed area with minimum 6 feet high walls with glazed ceramic tiles on three sides for car/vehicle/heavy equipment washing areas.
- 2. For storage, Logistics & Freight Forwarding activities, detailed justifications/calculations for truck/trailer parking, loading, unloading areas and Car Parking Space for the staff needs to be submitted. For such facilities/activities, adequate area shall be kept free for truck-trailer parking, containers grounding and loading/unloading activities.
- 3, Battery charging area shall be provided at minimum safe distance of 5 mtrs. from the storage area and with local exhaust ventilation @ 8-12 air changes/hour.
- 4. Changing Room with locker arrangement & Mess Room for workers shall be provided in each industrial/warehouse/factory building.
- 5. All columns inside the warehouse (fork-lift operating areas) shall be provided with protection bollards and painted with 100-mm wide red and white or yellow and black strips, same to be shown in the machinery/racking drawing layout.
- 6. Drawings for the generator shall be incorporated with location & its housing details with diesel tank and relevant brochures, point of smoke emission/discharge from the generator with details for noise level proof provisions.

- 7. All the stairs/steps shall be provided with non-slippery materials.
- 8. Health Clubs shall comply with Dubai Municipality requirement as per CMSS-QP-07A-GL06.
- 9. For high-rise buildings, provision of Cradle for Glass Cleaning/Maintenance activity shall be provided.
- 10. For industrial projects with potential for environmental contamination, ground water monitoring wells at minimum 3 locations should be provided to enable submission of quarterly analysis reports on the physico-chemical characteristics of the ground water as a measure and record of groundwater contamination (if any).
- 11. Suitable spill containment/collection provisions shall be provided in areas of potential spills.
- 12. Proper welding booths/enclosed area constructed with fire proof material to prevent UV rays/glare shall be provided.
- For storing portable full/empty Gas cylinders, proper storage area, outside the warehouse/industrial/factory building away from direct sunlight, and possible source of heat and ignition shall be constructed.
- 14. In premises with open storage, to prevent dust emissions and safety of equipment/ vehicles, all such Vehicle/equipment storage/operating areas & roads should be hard surfaced.

7.27 Food & Hygiene Department (Submission Requirements for Food Establishments)

- 1. Submit list of products and set of specification sheets.
- 2. **Scale:** A detailed to-scale drawing that is readable. Identify each room or area on the plans.
- 3. **Site plan:** Include facilities for skip and remote restrooms if applicable.
- 4. **Floor plans:** Submit plans of the entire facility, including plumbing layout, electrical layout, reflected ceiling plan, equipment layout details, and equipment elevations.
- 5. Entrances, exits, loading/unloading areas and docks: Provide details of these.
- 6. **Square footage:** Provide square footage of food facility and number of seats in dining room and/or bar if applicable.
- 7. Equipment schedule and Specifications: Size, construction and design specifications for equipment such as preparation tables, refrigeration units, cooking/holding/display equipment, dishwashing equipment and ventilation hoods. Include manufacturers' specification sheets and the method of installation for all equipment; Food service sinks must meet applicable international standards.
- 8. **Finish schedule:** Specify materials and finishes for floors, bases, walls, ceilings, shelving, and cabinets. This schedule should include the type of material, the color, and the surface finish. Samples or specifications of proposed finish materials may be submitted.
- 9. **Hoods:** Must be provided over all equipment that produces heat, gases, smoke, or vapors. Complete an Exhaust Hood Worksheet for each separate hood that is proposed.
- 10. **Plumbing plan:** Show complete plumbing layout (include grease trap) and water heater locations. Floor sinks must be accessible for cleaning and installed flush with the floor finish. Include specification sheets for all food service sinks. All food service sinks must meet local and international standards.

- 11. **Restrooms:** Must be provided for use by employees. Food establishments within a retail shopping center need not provide toilet facilities within their boundaries if public restrooms are located within 300 feet of the food establishment.
- 12. **Water heater:** Specify size and output in BTU/hour of the water heater. If fixtures are located more than 60 feet from the water heater, a recirculation pump must be installed.
- 13. **Hand wash sink:** A sink to be used exclusively for hand washing with hot and cold water must be provided within each food preparation area and equipped with mounted soap and towel dispensers or hand driers.
- 14. **Utensil washing:** A three-compartment stainless steel sink with dual integral drain boards is required if utensils are to be washed. The sink must be capable of accommodating the largest utensil to be washed. Each drain board shall be as large as the sink compartments. The three-compartment sink must drain to a floor sink.
- 15. **Dishwashing:** Where reusable customer utensils are used, provide a three-compartment stainless steel sink with dual integral drain boards or a dishwasher that meets local and international standards.
- 16. **Food preparation sink:** Establishments needing a separate sink for food preparation such as thawing, rinsing, or soaking shall have a stainless steel sink that meets local and international standards. The food preparation sink must drain to a floor sink.
- 17. **Mop sink:** Provide an approved janitorial sink with hot and cold water and backflow protection. Submit a specification sheet. The sink shall be located to prevent contamination of any food preparation areas, food storage areas, utensils, or equipment. A wall or enclosure may be required depending on location of the mop sink. Provide space for storage of a mop bucket and cleaning supplies. A curbed utility wash down area may be used in lieu of a mop sink.
- 18. Grease trap, pea (rice) traps and interceptors: Provide location and size. Check with the Environment department of EHS for requirements.
- Menu: Submit a menu or list of foods to be prepared in the food facility with the following details: Projected Volumes (expected meals/day):_____

Methods of food preparation: \Box Assembly \Box Cook and Serve \Box Preparation 1 day or more in advance \Box Cooling &Re-heating \Box Hot or Cold Holding \Box Service only

Style of Service:
To order
Self Service
Family Style
Other

20. A color coded Process flow chart demonstrating flow patterns for:

-food (receiving, storage, preparation, service);

-food and dishes (portioning, transport, service);

-dishes (clean, soiled, cleaning, storage);

-utensil (storage, use, cleaning);

-trash and garbage (service area, holding, storage);

- 21. Sneeze guards: Provide complete scale drawings and finish schedule of each sneeze guard.
- 22. Employee clothes storage / Dressing / Locker Rooms: A Room, enclosure, or designated area separated from toilets, food storage, food preparation areas and utensil washing areas must be

provided where employees may change and store clothes. Establishments with fewer than five (5) employees per shift can meet this requirement by providing employee lockers or similar cabinets.

- 23. **Storeroom:** The required floor area of the storeroom shall be determined as 25% of the kitchen area or 1 square foot per seat, whichever is greater. This area must include cleanable metal shelves. Shelves must be located to allow for 6" of clear space between the floor and the bottom shelf.
- 24. **Refrigerated Stores:** Calculated Total Refrigerated / Freezer Storage Needs based either on seating capacity or on meals served between deliveries
- 25. **Lighting:** Shatterproof shields are required on lights above food preparation areas, utensil washing areas, and where open food is stored. In areas where food is prepared or utensils are washed, lighting as required should be as per the Food Establishment Guidelines 2002.
- 26. **Skip area:** An area for skip and enclosure are required. Check with the Dubai Facility Services Management for requirements.

27. Cabinets or room for storing toxic chemicals:

- 28. Water supply: The water supply shall be from an approved water system.
- 29. **Sewage disposal:** Details of sewage disposal should be submitted. Check with EHS-FZ for requirements.

30. Additional Required Information

a. Plan for HACCP system implementation for all manufacturing establishment

b. Caterer

List the equipment used to protect food from contamination and to maintain product temperature during:

□Transportation

Hot or cold holding

□Service

5. Machines Vending Potentially Hazardous Foods

- ✓ Attach the label that will be affixed to the front of each machine with the name, physical address and phone number of the permitted food establishment servicing the machine
- ✓ Attach letter of agreement or approval from the establishment where the vending machine would be installed.
- 31. **Sub-leased facilities:** Copy of contract from the main lessee.
REPORTABLE DISEASES/OCCUPATIONAL DISEASES

Diseases	Activities
Conditions due to physical agents and the physical demands of work	
1. Inflammation, ulceration or malignant disease of the skin due to ionizing radiation.)
 Malignant disease of the bones due to ionizing radiation.)) Work with ionizing radiation)
3. Blood dyscrasia due to ionizing radiation.	5
4. Cataract due to electromagnetic radiation.	Work involving exposure to electromagnetic radiation (including radiant heat).
5. Decompression illness	
 Barotrauma resulting in lung or other organ damage. 	Work involving breathing gases at increased pressure (including diving)
7. Dysbaric osteonecrosis	
 Cramp of the hand or forearm due to repetitive movements 	Work involving prolonged periods of handwriting, typing or other repetitive movements of the fingers, hand or arm.
9. Subcutaneous cellulitis of the hand (<i>beat hand</i>)	Physically demanding work causing severe or prolonged friction or pressure on the hand.
10. Bursitis or subcutaneous cellulitis arising at or about the knee due to severe or prolonged external friction or pressure at or about the knee (<i>beat knee</i>)	Physically demanding work causing severe or prolonged friction or pressure at or about the knee.
11. Bursitis or subcutaneous cellulitis arising at or about the elbow due to severe or prolonged external friction or pressure at or about elbow (<i>beat elbow</i>)	Physically demanding work causing severe or prolonged friction or pressure at or about the elbow.
12.Traumatic inflammation of the tendons of the hand or forearm or of the associated tendon sheaths.	Physically demanding work, frequent or repeated movements, constrained postures or extremes of extension or flexion of the hand or wrist.
13.Carpal tunnel syndrome	Work involving the use of hand-held vibrating tools.

14.Hand-arm vibration syndrome.	 Work involving: (a) the use of chain saws, brush cutters or hand-held or hand-fed circular saws in forestry or woodworking; (b) the use of hand-held rotary tools in grinding material or in sanding or polishing metal; (c) the holding of material being ground or metal being sanded or polished by rotary tools; (d) the use of hand-held percussive metal-working tools or the holding of metal being worked upon by percussive tools in connection with riveting, caulking, chipping, hammering, fettling or swaging; (e) the use of hand-held powered percussive drills or hand-held percussive hammers in mining, quarrying or demolition, or on roads or footpaths (including road construction); or (f) the holding of material being worked upon by pounding machines in shoe manufacture.
Infections due to biological agents	(a) Work involving handling infected animals, their
15.Anthrax	products or packaging containing infected material; or(b) work on infected sites
16.Brucellosis	 Work involving contact with: (a) Animals or their carcasses (including any parts thereof) infected by brucella or the untreated products of same; or (b) Laboratory specimens or vaccines of or containing brucella.
17. (a) Avian chlamydiosis	Work involving contact with birds infected with chlamydia psittaci, or the remains or untreated products of such
(b) Ovine chlamydiosis	Work involving contact with sheep infected with chlamydia psittaci or the remains of untreated products of such sheep.
18.Hepatitis	Work involving contact with; (a) human blood or human blood products; or (b) any source of viral hepatitis.
19.Legionellosis	Work on or near cooling systems which are located in the workplace and use water, or work on hot water service systems located in the workplace which are likely to be a source of contamination.
20.Leptospirosis	 (a) Work in places which are liable to be infested by rats, field-mice, voles or other small mammals; (b) Work at dog kennels or involving the care or handling of dogs; or (c) Work involving contact with bovine animals or their meat products or pigs or their meat products.
21.Lyme disease	Work involving exposure to ticks (including in particular work by forestry workers, rangers, dairy farmers, gamekeepers and other persons engaged in countryside management).

22.Q fever	Work involving contact with animals, their remains or their untreated products.
23.Rabies	Work involving handling or contact with infected animals.
24.Streptococcus suis	Work involving contact with pigs infected with streptococcus suis, or with the carcasses, products or residues of pigs so affected.
25.Tetanus	Work involving contact with soil likely to be contaminated by animals.
26.Tuberculosis	Work with persons, animals, human or animal remains or any other material which might be a source of infection.
27.Any infection reliably attributable to the performance of the work specified in the entry opposite hereto.	Work with micro-organisms; work with live or dead human beings in the course of providing any treatment or service or in conducting any investigation involving exposure to blood or body fluids; work with animals or any potentially infected material derived from any of the above.
Conditions due to substances	
 28.Poisonings by any of the following: (a) acrylamide monomer; (b) arsenic or one of its compounds; (c) benzene or a homologue of benzene; (d) beryllium or one of its compounds; (e) cadmium or one of its compounds; (f) carbon disulphide; (g) diethylene dioxide (dioxan); (h) ethylene oxide; (i) lead or one of its compounds; (j) manganese or one of its compounds; (k) mercury or one of its compounds; (l) methyl bromide; (m) nitrochlorobenzene, or a nitro- or amino- or chloro-derivative of benzene or of a homologue of benzene; (n) oxides of nitrogen; (o) phosphorus or one of its compounds. 	Any activity
29.Cancer of a bronchus or lung	 (a) Work in or about a building where nickel is produced by decomposition of a gaseous nickel compound or where any industrial process which is ancillary or incidental to that process is carried on; or (b) Work involving exposure to bis(chloromethyl) ether or any electrolytic chromium process (excluding passivation) which involve hexavalent chromium compounds, chromate production or zinc chromate pigment manufacture.
30.Primary carcinoma of the lung where there is accompanying evidence of silicosis	 Any occupation in: (a) Glass manufacture; (b) Sandstone tunneling or quarrying; (c) The pottery industry; (d) Metal ore mining; (e) Slate quarrying or slate production;

	 (f) Clay mining; (g) The use of siliceous materials as abrasives; (h) Foundry work; (i) Granite tunneling or quarrying; or (j) Stone cutting or masonry;
31.Cancer of the urinary tract.	 Work involving exposure to any of the following substances: (a) Beta-napthylamine or methylene-bisorthochloroaniline; (b) Diphenyl substituted by at least one nitro or primary amino group or by at least one nitro and primary amino group (including benzidine); (c) Any of the substances mentioned in sub-paragraph (b) above if further ring substituted by halogeno, methyl or methoxy groups, but not by other groups; or (d) The salts of any of the substances mentioned in sub-paragraphs (a) to (c) above The manufacture of auramine or magenta.
32. Bladder cancer	Work involving exposure to aluminium smelting using the Soderberg process.
33.Angiosarcoma of the liver	 (a) Work in or about machinery or apparatus used the polymerization of vinyl chloride monomer, a process which, for the purposes of this sub-paragraph, comprises all operations up to and including the drying of the slurry produced by the polymerization and the packaging of the dried product; or (b) Work in a building or structure in which any part of the process referred to in the foregoing sub-paragraph takes place.
34. Peripheral neuropathy	Work involving the use or handling of or exposure to the fumes of or vapour containing n-hexane or methyl n-butyl ketone.
35. Chrome ulceration of:(a) the nose or throat; or(b) the skin of the hands or forearm	Work involving exposure to chromic acid or to any other chromium compound.
36. Folliculitis)
37. Acne) Work involving exposure to mineral oil, tar, pitch or
38. Skin cancer	arsenic.)
39. Pneumoconiosis (excluding asbestosis)	1.(a) The mining, quarrying or working of silica rock or the working of dried quartzose sand, any dry deposit or residue of silica or any dry admixture containing such materials (including any activity in which any of the aforesaid operations are carried out incidentally to the mining or quarrying of other minerals or to the manufacture of articles containing crushed or ground silica rock); or

	(b)the handling of any of the materials specified in the foregoing sub-paragraph in or incidentally to any of the operations mentioned therein or substantial exposure to the dust arising from such operations.
	2. The breaking, crushing or grinding of flint, the working or handling of broken, crushed or ground flint or materials containing such flint or substantial exposure to the dust arising from any such operation.
	3. Sand blasting by means of compressed air with the use of quartzose sand or crushed silica rock or flint or substantial exposure to the dust arising from such sand blasting
	 4. Work in a foundry or the performance of, or substantial exposure to the dust arising from, any of the following operations: (a) the freezing of steel castings from adherent siliceous substance or; (b) the freezing of metal castings from adherent siliceous substance: (i) by blasting with an abrasive propelled by compressed air, steam or a wheel, or (ii) by the use of power driven tools.
	5. The manufacture of china or earthenware (including sanitary earthenware, electrical earthenware and earthenware tiles) and any activity involving substantial exposure to the dust arising therefrom.
	6. The grinding of mineral graphite or substantial exposure to the dust arising from such grinding.
	7. The dressing of granite or any igneous rock by masons, the crushing of such materials or substantial exposure to the dust arising from such operations.
	8. The use or preparation for use of an abrasive wheel or substantial exposure to the dust arising therefrom.
	 9.(a) Work underground in any mine in which one of the objects of the mining operations is the getting of the material; (b) the working or handling above ground at any coal or tin mine of any materials extracted therefrom or any operation incidental thereto; (c) the trimming of coal in any ship, barge, lighter, dock or harbour or at any wharf or quay; or (d) the sawing, splitting or dressing of slate or any operation incidental thereto.
	10. The manufacture or work incidental to the manufacture of carbon electrodes by an industrial undertaking for use in the electrolytic extraction of aluminium from aluminium oxide and any activity involving substantial exposure to the dust therefrom.
	11. Boiler scaling or substantial exposure to the dust arising therefrom.
40. Byssinosis	The spinning or manipulation of raw or waste cotton of flax, carried out in each case in a room in a factory, together with any other work carried out in such a room.

41. Mesothelioma	
42. Lung cancer	
43. Asbestosis	 (a) The working or handling of asbestos or any admixture of asbestos; (b) The manufacture or repair of asbestos textiles or other articles containing or composed of asbestos: (c) The cleaning of any machinery or plant used in any of the foregoing operations and of any chambers, fixtures and appliances for the collection of asbestos dust; or (d) Substantial exposure to the dust arising from any of the foregoing operations.
44. Cancer of the nasal cavity or associated air sinuses	 1.(a) Work in or about a building where wooden furniture is manufactured; (b) work in a building used for the manufacture of footwear or components of footwear made wholly or partly of leather or fibre board; or (c) Work at a place used wholly or mainly for the repair of footwear made wholly or partly of leather or fibre board.
	 Work in or about a factory building where nickel is produced by decomposition of a gaseous nickel compound or in any process which is ancillary or incidental thereto.
45. Occupational dermatitis	 Work involving exposure to any of the following agents: (a) Epoxy resin systems; (b) Formaldehyde and its resins; (c) Metalworking fluids; (d) Chromate (hexavalent and derived from trivalent chromium); (e) Cement, plaster or concrete; (f) Acrylates and methacrylates; (g) Colophony (rosin) and its modified products; (h) Glutaraldehyde; (i) Mercaptobenzothiazole, thiurams, substituted paraphenylene-diamines and related rubber processing chemicals; (j) Biocides, anti-bacterials, preservatives or disinfectants; (k) Organic solvents; (l) Antibiotics and other pharmaceuticals and therapeutic agents; (m) Strong acids, strong alkalis, strong solutions (e.g. brine) and oxidising agents including domestic bleach or reducing agents; (n) Hairdressing products including in particular dyes, shampoos, bleaches and permanent waving solutions; (o) Soaps and detergents; (p) Plants and plant-derived material including in particular the daffodil, tulip and chrysanthemum families, the parsley family (carrots, parsnips, parsley and celery), garlic and onion, hardwoods and the pine family; (q) Fish, shell-fish or meat; (r) Sugar or flour; or (s) Any other known irritant or sensitising agent including in particular in particular any chemical bearing the warning "may cause sensitisation by skin contact" or

	"irritating to the skin".
46. Extrinsic alveolitis (including farmer's lung)	 Exposure to moulds, fungal spores or heterologous proteins during work in: (a) agriculture, horticulture, forestry, cultivation of edible fungi or malt working; (b)loading, unloading or handling mouldy vegetable matter or edible fungi whilst same is being stored; (b) caring for or handling birds; or (c) handling bagasse.
47. Occupational asthma	 Work involving exposure to any of the following agents: isocyanates; platinum salts; (c) fumes or dust arising from the manufacture, transport or use of hardening agents (including epoxy resin curing agents) based on phthalic anhydride, tetrachlorophthalic anhydride, trimellitic anhydride or triethylene-tetramine; (d) fumes arising from the use of rosin as a soldering flux; (e) proteolytic enzymes; (f) animals including insects and other anthropods used for the purposes of research or education in laboratories; (g) dusts arising from the sowing, cultivation, harvesting, drying, handling, milling, transport or storage of barley, oats, rye, wheat or maize or the handling, milling, transport or storage of barley, oats, rye, wheat or maize or the handling, milling, transport or storage of barley; (i) cimetidine; (j) wood dust; (k) ispaghula; (l) castor bean dust; (m) ipecacuanha; (n) azodicarbonamide; (o) animals including insects and other anthropods (whether in their larval forms or not) used for the purposes of pest control or fruit cultivation or the larval forms of animals used for the purposes of research or education or in laboratories; (p) glutaraldehyde; (q) persulphate salts or henna; (r) crustaceans or fish or products arising from these in the food processing industry; (s) reactive dyes; (t) soya bean; (u) tea dust; (w) fumes from stainless steel welding; (x) any other sensitizing agent, including in particular any chemical bearing the warning "may cause sensitization by inhalation".
48. Infectuous Diseases	Cholera, Typhoid, para typhoid, Salmonallosis, Bacillary Dysentery, Pulmonary Tubercolosis, Brucoliosis, Leprosy, Diphtheria, Pertusis, Scarlet Fever, Meningococcal Meningitis, Tetanus, Acute Poliomyelitis, Small Pox, Chicken Pox, Measles, Rubella, Viral Haemorrhagic fever, Hepatitis, Rabies, Mumps, Trachoma, Malaria, Opthalmia (Neonatorum), Leptospirosis, HIV, ARC, Meningitis, Viral Encephalitis.

MAXIMUM ALLOWABLE LIMITS FOR INDOOR AIR POLLUTANTS (GASES)

Two categories of Threshold Limit Values are shown here:

a) Time Weighed Average (TWA)- the time weighed average concentration for a normal 8-hour workday or 40-hour work-week, to which nearly all workers may be exposed, day to day, without adverse effect.

b) Short Term Exposure Limit (STEL) – the maximum concentration to which workers can be exposed for a period of up to 15 minutes continuously.

Name of the substance	TWA	STEL
Ammonia	25 ppm	35 ppm
Arsine	0.05 ppm	0.05 ppm
Asbestos	5 fibres per ml, more	
	than 5 um in length	
Butyl acetate	150 ppm	200 ppm
Carbon monoxide	50 ppm	400 ppm
Carbon tetrachloride – skin	10 ppm	25 ppm
Chlorine gas	1 ppm	3 ppm
Chromic acid	0.1mg/m3	0.1mg/m3
o-Dichlorobenzene C	50 ppm	50 ppm
p- Dichlorobenzene	75 ppm	110 ppm
Dicholoroethyl ether - skin	5 ppm	10 ppm
1.2 Dichloroethylene	200 ppm	250 ppm
Ethyl ether	400 ppm	500 ppm
Ethyl acetate	400 ppm	400 ppm
Fluorine	1 ppm	2 ppm
Formaldehyde C	2 ppm	2 ppm
Gasoline	500 ppm	500 ppm
Hydrogen Chloride C	5 ppm	5 ppm
Hydrogen cyanide - skin	10 ppm	15 ppm
Hydrogen Fluoride	3 ppm	3 ppm
Hydrogen Sulphide	10 ppm	15 ppm
Lead, inorganic, fumes and dusts	0.15 mg/m3	0.45 mg/m3
LPG (Liquidified Petroleum Gas)	1000 ppm	1250 ppm
Malathion – skin	10 mg/m3	10 mg/m3
Mercury (Alkyl compounds) - skin	0.001 ppm	0.003 ppm
Mercury (All forms except alkyl)	0.05 mg/m3	0.15 mg/m3
Methanol - skin	200 ppm	250 ppm
Monochlorobenzene	75 ppm	75 ppm
Methyl mercaptan	0.5 ppm	0.5 ppm
Methyl methacrylate	100 ppm	125 ppm

Nitric acid	2 ppm	4 ppm
Nitrobenzene - skin	1 ppm	2 ppm
Nitrogen dioxide C	5 ppm	5 ppm
Phosgene (carbonyl chloride)	0.1 ppm	0.05 ppm
Phosphine	0.3 ppm	1 ppm
Silica dust (50% respirable) –various	0.15 – 0.3 mg/m3	
Sulphur dioxide	5 ppm	5 ppm
Sulphuric acid	1 mg/m3	1 mg/m3
Tetra ethyl lead (TEL)	0.1 mg/m3	0.3 mg/m3
Tetra methyl lead (TML)	0.15 mg/m3	0.45 mg/m3
Trichloroethylene	100 mg/m3	150 ppm
Vanadium perntoxide - dust	0.5 mg/m3	1.5 mg/m3
- fumeC	0.05 mg/m3	0.05 mg/m3
Zinc oxide fume	5 mg/m3	10 mg/m3

Notes:

1. p.p.m. – Parts of vapour or gas per million parts of air by volume at 25°C and 760 mm mercury pressure.

2. mg/m³ - Milligrams of substance per cubic metre of air.

3. C - The concentration that should not be exceeded even instantaneously.

The above list only represents a few of the substances used in industry. In the case of substances not in the list, reference must be made to the current issue of "Occupational Exposure Limit (year)" revised and reprinted annually by the U.K. Health & Safety Executive as Guidance Note EH40/(year).

TABLE NO. 2- A

MAXIMUM ALLOWABLE LIMITS FOR INDOOR AIR POLLUTANTS (DUST)

SUBSTANCE	MAX. ALLOWABLE LIMITS (mg/m ³)
Respirable Dust	
Crystallize Silica (quartz)	0.1
Un-crystallize silica (graphite)	2.5
Asbestos (crisotile)	2(fiber/cm ³)
Total Dust	
Un-crystallize silica (graphite)	10
Stone wool	10
Silica jell	10
Portland cement	10
Dust From Biological Sources	
Hard wood vapors	1
Soft wood vapors	5
Inorganic Lead	1

TESTING OF LIFTING EQUIPMENT AND PRESSURE VESSELS

Boilers/	
Pressure Vessels	- 12 months internal and external, when all parts include blow down valve, safety valve and pressure gauge opened for inspection. On completion of inspection working test has to be carried out and safety valve floated.
Air Receivers	- 12 months of the internal and external examination.
Passenger Lifts	- Inspection after every 6 months.
Lifting tackles/ Lifting Equipment	- Inspection after every 12 months

OCCUPATIONAL NOISE

In every workplace, suitable measures shall be taken by the occupier to ensure that no worker is exposed to continuous sound levels exceeding the maximum exposure level given in the following table:

Sound level in dB(A)	Maximum No. of hours of exposure per employee per work day hours
Up to 85	8
92	6
95	4
97	3
100	2
102	1.5
105	1
110	0.5
115	0.25
more than 115	0

The following duties are laid on employers:

1. To make (and update where necessary) a formal noise assessment, where employees are likely to be exposed to:

a) First action level or above 85 dB(A)

b) Peak action level

2. To provide, at the request of an employee, suitable and efficient personal ear protection where employees are likely to be exposed to 85 dB(A) or above but less than 90 dB(A).

3. To designate ear protection zone.

4. To designate ear protection zone, indicating that it is an ear protection zone with signs, informing that ear protection must be worn.

5. The manufacturers and suppliers of noisy machinery to design and construct such machinery, so that the risks from noise emissions are reduced to the lowest level. Information on noise emissions must be provided when specified levels are reached.

SUITABLE LIGHTING

The lighting illuminance levels indicated in the following table shall be the minimum allowed in the listed operations :

Sr.	Operations	Lux
1	Operations not requiring accuracy like the ascertainment of large objects.	50
2	Operations requiring some accuracy like the assembly of machine parts, grinding	
	of grains and stones and similar primary industrial operations, chambers of steam	
	boilers, sections where the product is put in large containers, equipment	100
	storehouses and apparatuses used in semi-accurate operations.	100
3	Assembly of simple parts like turnery and moulding which do not require accuracy	
	and test conducted on products and machines and the sewing of light coloured	
	clothes, the storing of foodstuff, the manufacturing of wooden planks, leather and	200
	similar operations.	200
4	Operations requiring accuracy like turnery and lathe works which requires average	
	accuracy, and office work, final operations in production and similar operations.	250
5	Operations which require a great deal of accuracy like the assembly of small parts	
	and accurate turnery and fitter works, the cutting and reshaping of glass, accurate	300
	carpenting, office work, drawing and similar operations.	
6	Operations requiring extreme accuracy and patience such as tests conducted with	
	extreme accuracy, tests conducted on small or subtle tools and machinery, the	
	manufacturing of precious stones and watches, assembly of printing press letters,	500
	the weaving of dark coloured clothes and similar operations.	300

Notes:

1. Only safety has been considered, because no perception of detail is needed and visual fatigue is unlikely. However, where it is necessary to see detail to recognize hazards or where error in performing the task could put someone else at risk, the figure should be increased to that for work requiring the perception of detail.

2. The purpose is to avoid visual fatigue; the luminance shall be adequate for safety purposes.

STEAM BOILER INSTALLATION GUIDELINES

Prior to any steam boiler installation in the Free Zone, the following Health, Safety and Environment Protection Guidelines are to be fulfilled:

A. ENVIRONMENT PROTECTION GUIDELINES:

- 1. Details of steam boiler/heater : capacity, fuel type, fuel rate, sulphur content etc. to be provided.
- 2. Boiler room height any adjacent building height to be provided. Boiler chimney height calculation will be provided by EHS to the client.
- 3. The fuel tank should be bunded with impervious bund wall including the bund floor. The same should 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 & design should be provided.
- 4. Proper drainage facility should be provided for the boiler condensate and blow down as approved by EHS, away from the domestic drainage of the facility. A detailed drawing in this regard should be provided.
- 5. Refer PCFC Environmental Guideline. (2004) No. 2 for Large Boilers & Furnaces.
- 6. Proper sampling point & access ladder to be provided on chimney for emission quality checks.

B. <u>HEALTH & SAFETY GUIDELINES:</u>

- 1. Boilers should be installed at a safe distance from production or other working areas and to be protected (at least 3 mts.). Entry is to be restricted in the boiler rooms for authorized personnel only.
- 2. The boiler should be checked and certified by accredited third party (in case of new boiler, manufacturer's certificate is acceptable) every year. The test & certification should cover all the boiler's safety devices, gauges, internal and external conditions etc.
- 3. All Safety devices of the Boiler must be checked before starting and the safety devices as well as pressure gauges and water level meter should be located at a height of not more than 1.5 m from the ground level.
- 4. Boiler design should meet ASME boiler & pressure vessel codes.
- 5. 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.
- 6. 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.

TABLE No. 7 FIRST AID TRAINING

First aid training should be given by EHS Approved agencies (See H,S&F Guidelines) such as:
i) Registered medical practitioner/nurses with knowledge & experience of first aid in workplace.
ii) Qualified teachers or graduates/lecturers with current first aid certificates from Authority approved organization, or Lay trainers holding a certificate from HS&E approved organization, such certificate being renewable every two years.

The number of appointed and/or first aiders in different workplaces should be in accordance with the following table of requirements:

Category of Risk	First-aid Personnel		
LOW RISK (e.g. shops, offices, libraries):			
 fewer than 50 employed 	 at least one appointed person 		
 between 50 & 200 employed 	 at least one first-aider 		
 more than 100 employed 	 one more first-aider to every 100 		
MEDIUM RISK (e.g. light engineering and			
assembly work, food processing, warehousing):			
 fewer than 20 employed 	 at least two appointed persons 		
 between 20 & 100 employed 	 at least two first-aiders for every 50 		
 more than 100 employed 	 one more first-aider for every 100 		
HIGH RISK (e.g. most construction,			
slaughterhouses, chemical manufacture,			
extensive work with dangerous machinery):			
 fewer than 5 employed 	 at least two appointed persons 		
 between 5 & 10 employed 	 at least two first-aiders 		
 more than 50 employed 	- one more first-aider for every 50		
HIGH RISK including risk of poisoning for which	at least two first aider trained in the specific		
treatment with an antidote may be needed, or	- at least two mist-aluer trained in the specific		
where hazard justifies additional first-aid facilitiy	entergency delivit		

A certificate of qualification as a first-Aider is valid for two years, after which a refresher course, followed by further examination is necessary before the person can be granted a further certificate. First-Aiders should be trained in following techniques and be knowledgeable about:

a) Resuscitation;	j) Treatment of minor injuries;
b) Treatment and control of bleeding;	k) Treatment of burns and scalds;
c) Treatment of shock;	l) Eye irritation;
d) Management of unconscious casualty;	m) Poisons;
e) Contents of first-aid rooms;	n) Treatment of a casualty overcome by gas/ fumes
f) Purchasing first-aid supplies;	o) Simple record keeping;
g) Transport of casualties;	p) Personal hygiene in treating wounds; and
h) Recognition of illness;	q) Communication and delegation in an emergency.
i) Treatment to injuries to bones, muscles and joints;	

Work places must have first-aid facility established in accordance with the following table:

Number of Employees						
	1 – 50	50 - 150	150 - 250	250 - 1000	More than 1000	
No. of First-aid boxes stocked	1	2	2	In each work area		
First-aid room			yes	yes	Yes	
Trained certified first-aid staff				yes	Yes	
Nurse or Doctor					yes	

TABLE NO. 8 Accident / Incident Notification Form Section-1 Details Of Person Making This Report

	8 1		
Name, Company		Position :	
Contact No. & Address:			
Date & Time of Report:		Signature:	

Section-2 Accident / Incident Details

Project / Business Name &			
Address:			
Exact Location Of Accident /			
Incident:			
Name of Main Contractor /	Contact		
Business Senior Manager:	Number:		
Nature Of Accident/Incident	Dangerous Occurrence Fatality Major Over 3 Day Fire Property Damage Environmental Disturbance		
Date Of Accident / Incident:	Time of Accident / Incident:		
Accident / Incident Reported By:			
(Name & Position)			
Name Of Injured Person(s) If	Trade		
Known?	11000.		
Type Of Injury:	Bruise Sprain Fracture Cut Amputation Crush Burn Electric Shock Puncture Wound Other (State)		
Nature of work of injured person:			
Employer Of Injured Person:			
Details Of Plant / Equipment			
Involved In Accident / Incident:			
Accident/Incident Causal Factors: (tick/select most relevant cause)	lent Causal Factors: Lack Of Training □ Unsafe Act □ Unsafe Condition □ Poor Supervision □ <i>nost relevant cause)</i> Management System Failure □ Other □ (State)		

Section-3 Brief Details Of The Accident / Incident.

Section-4 Immediate Actions Taken.

Section-5 Witnesses to the Accident / Incident.

Name	Position	Company	Contact Nos.

✤ If necessary continue on a separate piece of paper and attach to this form.

4 In case of all reportable accidents this form must be faxed to EHS within 24 hours of the accident (04) 8818857/8817023

In the case of fatal or major incident, EHS must be first notified by calling (04) 8833111 immediately

4 Any contractor failing to give required information or providing false information will be liable to further action being taken

<u> PART - II</u>

FIRE PROTECTION, FIRE PREVENTION & FIRE/EMERGENCY CONTROL REGULATIONS

SECTION 1 - SCOPE

- The provisions of these regulations establish minimum fire protection requirements / prescriptive criteria for buildings, facilities or structures within PCFC jurisdiction. The requirements / criteria reflect the need for the protection of life and property while taking into account the assessed risks associated with the buildings, facilities or structures, their contents and quality assurance and safeguards before, during and after construction.
- The provisions shall be applicable to all new and all types of existing buildings, facilities or structures and their contents and permitted activities whether considered permanent or temporary, mobile & stationary equipment, waterfront facilities and shore protection for ships within PCFC jurisdiction.
- 3. The provisions shall also be applicable to construction, alteration, repair, equipment, use and occupancy, maintenance, relocation & demolition of any building, facility or structure or any appurtenances connected or attached to such buildings, facilities or structures within PCFC jurisdiction.
- 4. The provisions primarily address those construction, protection and occupancy features necessary to minimize danger to life & property.
- 5. All provisions of these regulations are based almost on functional requirements and do not encompass detailed dimensional and technical specifications.
- 6. The provisions are mandatory. Also, all requirements placed hereunder at every Guideline Notes and the ones contained in Appendices to these regulations are mandatory with relation to the principal matter to which they stand as requirements.
- 7. The provisions shall be used consistently as a mandatory reference document for the development of detailed documents (including scope, basis of design, technical requirements, plans, design drawings & specifications etc.) by the consulting services, including that of fire protection experts / specialists, hired by the developers /lessees / licensees. The provisions shall not be used in lieu of detailed documents that are required to be so developed.
- 8. Ports, Customs & Free Zone Corporation (PCFC) has adopted by reference National Fire Protection Association (NFPA) USA and its companion Codes, standards and publications including their official definitions, for application of their prescriptive design criteria / requirements within PCFC jurisdiction.
- 9. The term "Authority Having Jurisdiction (AHJ)" as used in NFPA codes, standards and publications referenced in these regulations indicates the office of responsibility i.e. The Competent Department : EHS-Fire Department, as represented by its officers including Vice President/Chief Fire Officer and his deputy for enforcing (i) the requirements of NFPA and its companion codes, standards and publications (ii) provisions of these regulations (iii) requirements of EHS-Fire Department and (iv) applicable statutes and regulations of UAE / Dubai Governments; and Vice President / Chief Fire Office of EHS-Fire Dept is the person who is ultimately responsible to PCFC/EHS management for the enforcement of

the foregoing requirements, statutes, rules & regulations and for the delivery of fire, non-fire and emergency medical services (i.e. ambulance services in accordance with DOH protocol).

- 10. Certain requirements and recommendations [that may not be covered in NFPA codes/publications/standards] that are necessarily recommended by the EHS Fire Department on a case-by-case basis shall be complied with notwithstanding mere compliance with NFPA codes/publications/standards.
- 11. In the event of any conflict between the text of the references cited herein in regard to NFPA and its companion codes, standards and publications, the text of the relevant and applicable codes, standards and publications shall take precedence.
- 12. Omission of any specific references or cross references, in regard to any NFPA and its companion codes, standards and publications, shall not relieve the developers / lessees / licensees of their obligation to complying with such codes, standards and publications having regulatory jurisdiction effect and force.
- 13. Where the situation and the context warrants, the consultants including fire protection experts / specialists shall be obligated to gather the explicit interpretation of the words of any provisions of these regulations from EHS-Fire Dept / AHJ and not from what they profess it to be when they have translated their self-assumption or intention into requirements.
- 14. Where appropriate relevant and current statutes and regulations of UAE/Dubai Governments shall be applicable.
- 15. <u>Insurance</u>: Developers / lessees / licensees are required to have their lands and premises insured against Fire, Explosion and Perils.

SECTION 2 - EQUIVALENCIES

- Equivalencies to any established prescriptive criteria of NFPA and its companion codes, standards and publications, the provisions of these regulations may be approved by the EHS-Fire Dept / AHJ, if the alternative fire protection engineering design provides an equivalent level of fire protection and life safety. Written requests for approval shall include justification, hazard analysis, criteria used and other pertinent data.
- 2. Lack of funds and time deadlines of projects shall not be considered sufficient justification for deviation from the established criteria requirements and provisions.
- 3. Approved equivalencies and alternatives shall only apply to the specific building, facility or structure involved in extraordinary case where no technical alternatives exist; and shall not constitute blanket approval for similar cases.

SECTION 3 - WAIVERS

1. Written request for waiver to any established prescriptive criteria of NFPA and its companion codes,

standards and publications or provisions of these regulations shall be submitted to EHS-Fire Dept/AHJ for determination prior to commencement of building constructions. The same shall demonstrate that the provisions, criteria or requirements cannot be technically executed, or their execution will increase a hazard or create a new hazard and no technical alternatives exist. Written request for waivers shall include justification, hazard analysis, alternatives considered and other pertinent data.

- 2. Lack of funds and time deadlines of projects shall not be considered sufficient justification for deviation from the established criteria, requirements or provisions.
- 3. Waivers, if given expressly by EHS-Fire Dept / AHJ, shall only apply to the specific building, structure, facility or project involved and shall not constitute blanket approval for similar cases.

SECTION 4 – ABSENCE OF CRITERIA

- 1. When a specific application is not covered by the criteria or the provisions of NFPA codes, standards & publications; other international building codes, recognized industry standards and standard engineering practices shall be followed with prior and express approval of EHS-Fire Department / AHJ.
- 2. Where appropriate the provision of Part-2 (Equivalencies) shall apply.

SECTION 5 – EXISTING BUILDINGS, FACILITIES

1. Existing buildings, facilities or structures:

- (i) Existing buildings, facilities or structures that meet the requirements of NFPA 101 for existing occupancies do not have to be modified to comply with provisions of these regulations.
- (ii) Existing Buildings, facilities or structures that do not meet the requirements of NFPA 101 for existing facilities and in the opinion of the Competent Department, present major fire risks, shall be brought up to, at least, the minimum NFPA 101 requirements, including sprinkler retrofit.
- (iii) If the facility cannot be brought up to the minimum requirements for existing occupancies and a renovation, modernization or rehabilitation project is required, that project shall meet the requirements for new construction as stipulated in these regulations.
- (iv) Any changes in occupancy shall require the building, facility or structure to meet the requirements for new construction for the new occupancy as stipulated in these regulations.

2. Sustainment and Restoration:

New work accomplished in existing buildings, facilities or structures as part of repair, restoration and sustainment actions / projects shall meet the requirements for new construction as stipulated in these regulations. Sustainment and restoration efforts shall look beyond the scope of work to ensure that the fire protection, including life safety, features are not being compromised or designed only for the portion of the building, facilities or structure that is being repaired. The repair project, if possible, shall include a basis to support the entire building, facility or structure i.e. if considering providing a fire

alarm extender panel to the existing antiquated fire alarm control panel, ensure the panel being provided has the capability to support the entire building facility or structure so that any additional projects can utilize the new panel without having to remove what was just installed.

3. <u>Conversion of use / change of occupancy:</u>

- i. When any portion of a building, facility or structure is modified from its current use to that of an inhabited building, facility, structure for one year or more, the building, facility or structure shall meet the requirements for new construction as stipulated in these regulations. Examples would include a warehouse (uninhabited) being converted to administrative (inhabited) use; an inhabited administrative building being converted to uninhabited building, facility or structure; or inhabited building, facility or structure being altered, modernized, modified, rehabilitated or renovated and converted to uninhabited building, facility or structure or vice-versa.
- ii. When any portion of a building, facility or structure is modified from its current use to any other occupancy use for two years or more, the building, facility or structure shall meet the requirements of new construction as stipulated in these regulations. Changing groups of occupants within the occupancy classification does not constitute an occupancy change. An example of modifying from one occupancy to another would include an office building converted to mercantile. An example of changing groups of occupants would include an installation personnel function occupying the office space formally used by an installation contracting function.

SECTION 6 – FIRE CONSULTANCY SERVICES

- The qualified, competent & authorized / registered consultants shall submit the documents and drawings through EHS as per Appendix – 1.
- 2. The Consultants (service providers) executing projects involving fire protection design, fire rated construction, fire detection, fire suppression or life safety systems including evacuation plans shall be required to provide / hire the services and review of a qualified fire protection expert/specialist. Such fire protection expert/specialist shall be an integral part of the design team and shall be involved in every aspect of fire protection design. This shall include, but not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression systems, water supply analysis and a multi-discipline review of the entire project.
- 3. A qualified fire protection expert /specialist shall be fully conversant with all provisions of these regulations and also meet one of the following conditions: -

Fire protection expert / specialist within the meaning & context of the provisions of these regulations shall be an engineer having a Bachelor of Science, Advanced Diploma or Master of Science Degree in Fire Protection Engineering from an accredited university engineering program or recognized Fire Engineering Institution of repute plus a minimum of 10 years of work experience dedicated to fire protection engineering including application of NFPA and its companion codes and standards that can be verified with documentation.

A registered professional engineer (P.E) in a related engineering discipline who has passed the fire protection engineering written examination administered by an accredited university or recognized Fire Engineering Institutions of repute plus minimum of 5 years of work experience dedicated to fire protection engineering including application of NFPA and its companion codes and standards that can be verified with documentation.

4. EHS-Fire Dept / AHJ reserves the right to approve fire protection experts / specialists.

Guideline Notes: -

- i. The consultants 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 construct in compliance with the required standards, failure to comply with rules of Professional ethics, failure to use knowledge and experience to the contracting entity, 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 pursuant to the laws of the UAE.
- ii. EHS-Fire Dept/AHJ, EHS Dept or any other departments of PCFC and their directors, officers & 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.

SECTION 7 – RISK ASSESSMENT STUDIES

- Risk Assessment study shall be mandatory normally for manufacturing & process industries, store places for flammable, combustible and other hazardous liquids, solids & gases, Tank Farms, Spheres, Bullets, Liquid & gas storage tanks, boilers & pressure vessels, gas distribution systems, Petrol, Oil & Chemical distribution systems / pipelines and other special structures.
- 2. Risk Assessment study shall be carried out and report to that effect shall be submitted to EHS Dept by the qualified, competent & authorized / registered consultants (Refer H,S&F Guidelines)
- EHS approved Risk Assessment consultants shall adhere to PCFC-EHS "Risk Assessment Guidelines" (Refer H,S&F Guidelines). Major aspects are as follows :
- 4. _EHS approved Risk Assessment consultants shall include, but not limited to, the following points in their Risk Assessment/Analysis Report:
 - i. Fire hazard identification.
 - ii. Severity analysis/Fire & Explosion Index (F & EI) and Toxicity Index (TI). (Refer H,S&F Guidelines)
 - iii. Mapping areas of risk, risk contours and risk transect
 - iv. Direct comparison with actuarial data and other risk criteria.
 - v. Criteria for assessing maximum release quantity and separation distances / Quantifying dispersion.
 - vi. Scenario development.
 - vii. Probability analysis / the chances of fire and explosion.

- viii. Risk monitoring (if the risk is acceptable).
- ix. Identification of environmental problems that are related to fire protection.
- x. Risk reduction analysis (if the risk is not acceptable) systems & methods and recommendations to prevent and/or reduce them to the acceptable level(s).
- xi. Hazard and Operability Study (HAZOP)
- xii. Event trees
- xiii. Case histories where appropriate
- xiv. Compliance with codes, procedures and regulations including manufacturing requirement & management under ASME code for boilers & pressure vessels.
- xv. Toxicity relationships & dense gas dispersion model
- xvi. Damage from fire and radiant heat
- xvii. The TNT equivalence
- xviii. Primary and secondary blasts relationships
- xix. Top event frequency estimation
- xx. Design & construction procedures
- xxi. Maintenance Operations
- xxii. Education & Training of staff
- xxiii. Emergency / Evacuation Plans (on site & off site plans including emergency actions, emergency reporting procedures, evacuation policy, exit maps, procedure for sheltering in place, procedure for people who remain in place, procedure for accounting for all personnel, Rescue and medical tasks and emergency communication plan.)

Guideline notes:

- i The scale that measures severity such as death, injuries, property damage, and areas reached by flames shall be specified.
- ii Calculations specifying the severity measure used for a particular fire shall be included.
- iii Active and passive fire protection measures shall be included.
- iv The consultants 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 construct in compliance with the required standards, failure to comply with rules of Professional ethics, failure to use knowledge and experience to the contracting entity, 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 caused to complete and compensate for any such losses or damages pursuant to the laws of the UAE.
- EHS-Fire Dept/AHJ, EHS Dept or any other departments of PCFC and their 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.

SECTION 8 – PLANS/FIRE LAYOUT DRAWINGS

- 1. The plans/Fire Layout Drawings shall be clear and legible and cover the following details:
 - i. Necessary/requisite details, point of compass, scale and date.
 - ii. Indicate limits of boundary wall.
 - iii. Indicate all buildings/structures/plants, door and window openings, and future expansion/extensions.
 - iv. Plans for storied buildings/structures/plants shall include plans of each storey and its sectional elevations. Also, the locations of staircases, landing valves/hydrants and fire access details shall be indicated.

- v. Layout of fixed fire fighting installations.
- vi. Layout of fire detection & fire alarm systems.
- vii. Locations of fire extinguishers, exits & emergency lights/escape lighting luminaries.
- viii. Use of fire safety symbols as per NFPA 170.
- Building plans for special structures and high rise buildings shall indicate the following additional details:
 - i. Access to fire & other emergency vehicles with details of vehicular turning circle and clear motorable access way around the building;
 - ii. Size (width) of main and alternate staircases along with balcony approach, corridor, ventilated lobby approach;
 - iii. Location size of fire lift and details of lift enclosures;
 - iv. Smoke stop lobby / door;
 - v. Refuse chutes, refuse chamber, service duct etc;
 - vi. Vehicular Parking Space;
 - vii. Refuge area;
 - viii. Details of Building Services/ Utilities (air conditioning system, dampers, mechanical ventilation system electrical services, gas tanks & gas pipes etc).
 - ix. Details of exits including provision of ramps, etc for hospitals, advanced medical care facilities & other special risks;
 - x. Location of generators, transformers, and switchgear rooms.
 - xi. Smoke Management System
 - xii. Location of centralized control connecting detection & fire alarm systems, built-in protection system and public address system including one-and-two way voice communication systems.
 - xiii. Location and dimension of static water storage tank and pump room; and number and capacity of fire pumps.
 - xiv. Location and details of fixed fire protection systems/ installations such as sprinklers, risers, hose reels and inert gas / clean agent fire suppression systems etc;
 - xv. Location and details of first aid and fire fighting equipment.
 - xvi. Number of stairwells, Pressurized stairwells.
- xvii. Extent of automatic sprinkler system and its location.
- xviii. Number and location of standpipe system and zone control valves.
- xix. Contact information for building owners and managers.
- xx. Buildings height, numbers of stories & building address.
- xxi. Classification of occupancy (i.e. use of building. Residential or mixed use and number of dwelling units.)
- xxii. Passive Fire Protection, rating of door assemblies, partitions/compartmentation etc.
- xxiii. Building code analysis (i.e. type of construction, height and area limitations and building separation or exposure protection)

- xxiv. Specific compliance with NFPA codes, provisions of these regulations (Compliance & Method Statement) & EHS-Fire Dept. requirements.
- xxv. Interior finish ratings
- xxvi. Co-ordination with Civil Engineering, EHS & Security departments.

Guideline notes:

- The site layout shall normally allow for a minimum setback of 5.5 Mtrs. from all boundaries so as to maintain/permit necessary and natural fire break.
 - i The building/structure/plant shall be accessible to fire tenders and other emergency vehicles.
- ii Unobstructed layout of building/structure/plant for easy fire fighting.
- iii Emergency lights/escape lighting luminaries shall be sited near each exit door and at the points where it is necessary to emphasis the position of safety equipment, signs and potential hazards (i.e. near intersection of corridors, exit doors, staircase flights, change of direction, change of floor level, fire fighting equipment, fire alarm call points, outside final exits, lift cars and plant rooms).

SECTION 9 - BUILDING DESIGN AND LIFE SAFETY

1. <u>Classification of Occupancy and Hazards of Contents and Special Operation:</u>

Relevant provisions of NFPA 101, 2006 (Chapter – 6) and of NFPA 5000, 2006 (Chapter – 6) shall apply.

2. Special Structures & High Rise Buildings:-

Relevant Provisions of NFPA 101, 2006 (Chapter – 11) and of NFPA 5000, 2006 (Chapters 32 & 33)) shall apply.

Guideline notes:

Refer to Appendix 2 for Fire Protection / Fire Safety Guidelines For Designing High Rise Buildings

3. Features of Fire Protection and Fire Resistive Materials and Construction: -

- i. Every building, facility or structure shall be constructed, arranged, equipped, maintained, and operated to avoid undue danger to the occupants from fire, smoke, fumes, unsafe conditions or resulting panics.
- ii. Relevant provisions of NFPA 101, 2006 (chapter-8) and of NFPA 5000, 2006 (Chapter-8) shall apply.

Guideline notes:

- i Use of fire-resistive barriers to slow spread of fire to large secondary items.
- ii Use construction barriers to block fire spread between zones (wall assemblies, ceiling/floor assemblies, barriers between occupied and concealed places, fire-stopping in concealed spaces and

exterior barriers to vertical spread between floors).

- iii Design doors and windows to block fire spread between zones (Fire door assemblies and window restrictions to block fire spread between buildings/structures/plants).
- iv Separate buildings, facilities or structures enough to prevent fire spread between them.
- Regulate design and operation of systems for heating, venting, and air conditioning to prevent their serving as mechanism to transfer smoke and gases into uncontaminated occupied areas. (This shall also permit shut off of air movement in fires).
- vi Plug vertical and horizontal utility openings (pipes, cable ducts, AC ducts and cables) and peepthrough (at doors, columns & beams) by suitable fire resistive sealant.
- vii Consider compartmentation to contain spread of fire/smoke/heat.
- viii <u>Fire retardant treated (FRT) plywood</u>: FRT plywood shall not be used in any part of the roof or roofing systems. Existing FRT plywood installations shall be regularly inspected for structural integrity. Replacement of damaged FRT plywood may require additional fire protection measures if FRT plywood is to be replaced with more combustible materials.

4. Interior Finish, including floor finish, Contents & Furnishings: -

- i. Relevant provisions of NFPA 101, 2006 (Chapter 10) and of NFPA 5000, 2006 (Chapter 10) shall apply.
- ii. Restrict materials used in contents and furnishings to reduce heat release rate and smoke generation rate & to prevent unusual toxic hazard relative to quantity of smoke generated.
- iii. Add fire retardants to materials to slow growth of heat release rate.
- iv. Restrict total fuel load to limit contents based in total fuel potential.
- v. Restrict linings of rooms to prevent rapid flame spread (Restrict wall coverings, ceiling coverings, and floor coverings).
- vi. Restrict materials in concealed spaces (Restrict concealed combustibles and concealed space linings).
- vii. Drop-out ceilings (foam-grid panels) shall not be used.

5. Lifts Fire Lifts / Elevators and Conveying Systems:-

- New lifts shall be designed in accordance with ASME A 17.1 which includes provisions for a fire lift. Relevant provisions of NFPA 101 (Sections 8.6.8.3, 9.4.3.1, 9.4.2.1, 9.4.5, 9.4.6 & 9.4.7) and of NFPA 5000, 2006 (Chapter – 54) shall apply.
- ii. All the floors shall be accessible for 24 hours by the lifts. The lifts provided in the buildings shall not be considered as a means of escape in case of emergency.
- iii. The lift machine room shall be separated and no other machinery shall be installed therein.
- iv. Lifts designed in accordance with Dubai Municipality standards shall also be approved.

6. Buildings Service and Fire Protection Systems and Equipment:-

Relevant provisions of NFPA 101, 2006 (Chapter – 9) and of NFPA 5000, 2006 (Chapter – 55) shall apply.

Guideline notes:

- i. <u>Fire Detection & Fire Alarm Systems</u>: Every building, facility or structure shall be provided with suitable fire detection / alarm systems capable of enabling early detection of fire and warning occupants of the existence of fire. These systems shall be electronically interfaced with PCFC Emergency Control Centre (ECC) monitoring system through a digital communicator.
- ii. <u>Portable Fire Extinguishers</u>: Every building, facility or structure shall be provided with portable fire extinguishers of types, capacities, numbers, and locations appropriate to the individual building or structure with due regard to the character of its occupancy. All the fire extinguishers shall conform to the standards currently approved by UAE/Civil Defence Authorities.
- iii. <u>Fixed Fire Fighting Installations/Systems</u>: Every building, facility or structure shall be provided with fixed fire fighting installations/systems as required by relevant NFPA codes / EHS Fire Dept. The fixed fire fighting installations/systems, so recommended, shall mostly include [but not limited to] the following:
 - a) Hose Reel.
 - b) Sprinkler including Early Suppression Fast Response (ESFR) sprinklers system
 - c) Water Spray System
 - d) Automatic Smoke/Heat/ Flame/Low Explosive Limit (LEL) Detectors.
 - e) Smoke and heat ventilation system.
 - f) Deluge foam or water sprinkler & foam or water spray systems.
 - g) Closed-Head foam water sprinkler system.
 - h) Total flooding systems (of appropriate extinguishing agent (s).)
 - i) Foam Pourer System.
 - j) Foam/Water monitors.
 - k) Hydrants and Hose Boxes.
 - I) Fire Pumps &
 - m) Fire Water Tanks.
- iv. <u>Smoke & Heat Ventilation System</u>: Smoke & Heat vents shall be considered in buildings where a high rate of heat release is anticipated during a fire. In buildings without automatic sprinklers, smoke and heat vents shall be arranged to operate automatically in accordance with NFPA 204. In buildings with automatic sprinkler protection, smoke and heat vents shall be arranged to operate in the manual mode only. Skylights are the preferred method of providing manual smoke and heat vents. NFPA 92A, NFPA 92B and BS EN 12101 shall be applicable where appropriate.
- v. <u>Water demands for sprinklered buildings, facilities or structures</u>: The water demand required for sprinkler protection shall take into consideration occupancy, discharge density, design area and type of sprinkler system (wet or dry), type of construction and other building features.

- vi. <u>Water demands for hose streams</u>: Hose streams shall be needed concurrently with sprinkler discharge in order to effect final extinguishment or to wet down adjacent areas / structures.
- vii. <u>Total water demand for sprinklered occupancies</u>: The total water demand for sprinklered occupancies is equal to the sum of the domestic / industrial demand plus the sprinkler system(s) water demand and hose stream(s) demand. The total demand shall be available at the sprinkler system connection to the underground main and at the pressure necessary to produce the required sprinkler density over the required hydraulically most remote area of sprinkler operation. Water demand for special facilities, family housing, piled or rack storage, rubber tire storage, flammable & combustible liquid storage shall be determined on the basis of relevant NFPA codes. Relevant provisions of NFPA 13 shall apply.
- viii. <u>Water supply pressure requirements</u>: Pressure required for sprinklered buildings, facilities or structures shall be the most demanding pressure of the domestic / industrial demand, sprinkler demand or hose stream demand and shall be determined by hydraulic calculations. Relevant provisions of NFPA 13 shall apply.
- ix. <u>Quantities of water required:</u> Requirements for fire protection water storage shall be based on the assumption that there will be only one fire at a time. The quantity of water required shall be equal to the product of the fire protection water demand and the required duration. This quantity represents fire protection requirements only and shall be available at all times. Water supply for domestic, industrial and other demands shall be added to these requirements to determine the total amount of water that is necessary at the building, facility or structure. The water storage shall be self replenishing. It shall reach required volume during normal consumption within 48 hours and within 24 hours curtailing normal consumption.

Relevant provisions of NFPA 13 shall apply.

- x. <u>The pumps</u>: Pumps shall have adequate capacity with reliable power and water supply. They shall conform to the requirements of NFPA 20. Fire pumps, drivers and other equipment including automatic accessories shall be listed by UL, approved by FM or listed or classified by NRTL. Fire pumps shall be located in a detached, noncombustible pump house or located in a 2-hours fire rated room with direct access from the exterior. A secondary fire pump shall be provided when the water supply cannot support 25% of the sprinklers in the hydraulically most remote design area with the primary fire pump out-of-service.
- xi. <u>Fire Mains</u>: Use of fire mains for the services like irrigation, process & domestic purposes shall not be permitted.

<u>Pressure-Regulating Valves (PRVs)</u>: PRVs are restricted in use on fire protection water systems by NFPA 24. Where essential, PRVs shall be installed on individual service rather than on main piping. Where PRVs are provided in distribution mains supplying systems or portions of systems with fire hydrants, automatic sprinkler systems or other installed fire protection, the following features shall be provided to safeguard against failures and to facilitate maintenance:-

- > Control valves on each side of the PRVs.
- Bypass around PRVs.

- xii. <u>Foam Systems</u>: Foam installations shall be in accordance with NFPA 11 , NFPA 11A and NFPA 16. For more information refer to the NFPA Fire Protection Handbook and FM Global Data Sheets.
- xiii. <u>Dry Chemical Extinguishing Systems</u>: Dry chemical extinguishing systems shall conform to NFPA 17. Dry chemical agents shall not be used protect sensitive electronics. Dry chemical extinguishing systems are no longer UL listed or FM approved for the protection of cooking equipment.
- xiv. Carbon Dioxide Systems: Carbon dioxide systems shall conform to NFPA 12.
- xv. Wet Chemicals Extinguishing Systems: Wet Chemical Systems shall conform to NPFA 17 A.
- xvi. <u>Clean Agent Fire Extinguishing Systems</u>: Clean agent fire extinguishing systems shall conform to NFPA 2001. Clean agent fire extinguishing systems shall not be installed as a substitute for required automatic sprinkler systems.
- xvii. <u>Water Mist Fire Protection Systems</u>: Water mist fire protection systems shall conform to NFPA 750. Water mist fire protection systems shall not be installed as a substitute for required automatic sprinkler systems.
- xviii. Emergency Warning System shall include both: audible and visual alarms.

7. Means of Access / Accessibility: -

- Relevant provisions of NFPA 5000, 2006 (Chapter-12) shall apply.
 No building, facility or structure shall be erected so as to deprive any other building of the means of access.
- ii. The approach road to the building and open spaces on its all sides up to 6m width and the layout for the same shall be done in consultation with EHS-Fire Department and the same shall be of allweather ground access hard surface capable of taking the weight of the heaviest fire vehicle available with Fire Dept. /Civil Defence Authority (Refer to EHS-Fire Dept. for the current information).
- iii. Main entrances to the premises shall be of adequate width to allow easy access to the fire vehicles and in no case it shall measure less than 5 meters. The entrance gate shall fold back against the compound wall of the premises, thus leaving the exterior access way within the plot free for movement of the Fire/ Civil Defence Vehicles. If archway is provided over the main entrance, the height of the archway shall not be at a height less that 4 m.
- iv. Any locking device controlling vehicle access shall be under control of 24 hour security personnel located at the specific facility.
- v. Buildings, facilities or structures with fire department connections for sprinkler or standpipe systems shall be provided with suitable all-weather ground access surface for pumper apparatus within 45m of such fire department connections.
- vi. The provisions of Part 9 Section 5 of these regulations shall be complied with.

8. Means of Egress:

- Every building, facility or structure shall be provided with safest means of egress and other safeguards of kinds, numbers, locations and capacities appropriate to the individual building or structure with due regard to type of occupancy, the capabilities of the occupants, number of persons exposed, the fire protection available, the type of construction of the building or structure and other factors necessary to provide all occupants with a reasonable degree of safety. The requisite number and size of various exits shall be provided based on the population in each room, area and floor based on the occupant load, capacity of exits, travel distance and height of buildings. (Appendix 3)
- ii. Adequate means of egress shall be provided in every building, facility or structure, where the size, area of occupancy and other arrangements [that are likely to endanger the occupants attempting to use a single means of egress] are blocked by fire or smoke. All such means of egress shall be so arranged to minimize the possibility of theirs being rendered impassable by the same emergency conditions.
- iii. Every exit stairway and other vertical openings between floors of a building, facility or structure shall be suitably enclosed or protected as necessary to afford reasonable safety to occupants while using the means of egress and to prevent the spread of fire, smoke or fumes through the vertical openings from floor to floor before the occupants have reached the nearest exit.
- iv. Exits shall be so arranged that they may be reached without passing through another occupied unit except in case of residential buildings.
- v. Means of egress component shall comply with NFPA 101, 2006 (Chapter 7) and of NFPA 5000, 2006 (Chapter 11).
- vi. The population in rooms, areas of floors shall be calculated based on the occupant load factors given in the **Appendix-4** to these regulations.
- vii. Common path, Dead-End and Travel Distance limits etc. shall comply with **Appendix-5** to these regulations.
- viii. Illumination of means of Egress shall be provided in accordance with NFPA 101 (Section 7.8) for every building and structure where required in chapter 11 through chapter 42.
- ix. Emergency lighting facilities for means of egress shall be provided in accordance with NFPA 101 (Section 7.9) for the buildings and structures where required in chapter 11 through chapter 42.
- Walking surfaces in means of egress shall comply with sections 11.7.6.2 through 11.1.6.4 of NFPA 5000, 2006.
- xi. Every ramp used as a component in means of egress shall conform to the general requirements of section 11.1 and to the requirements of 11.2.5 of NFPA 5000, 2006.
- xii. Areas of refuge shall conform to section 11.2.12 of NFPA 5000, 2006.
- xiii. Slid Escapes shall be permitted as a component in a means of egress where permitted in chapter 16 through 30 of NFPA 5000, 2006.
- xiv. Locks, latches, alarm devices, delayed egress locks, access controlled egress doors, Panic hardware, Fire exit hardware, Self closing devices, Powered doors, revolving doors, turnstiles, doors in folding partitions, balanced doors, horizontal sliding doors, stairs, curved stairs, spiral

stairs, winders, landings, guards, handrails, bridges and balconies etc shall comply with relevant sections of NFPA 5000, 2006 & NPFA 101, 2006.

- xv. <u>Corridors:</u> Egress corridors shall not be used as a portion of a supply, return or exhaust air system serving adjoining areas. Air transfer opening(s) shall not be permitted in walls or in doors separating egress corridors from adjoining areas. Exception: Toilet rooms, bath rooms, shower rooms, sink closets and similar auxiliary spaces opening directly onto the egress corridor.
- xvi. <u>Stairways:</u> Stairs shall be constructed of concrete, steel or a combination of two. Wood construction shall not be used. Treads shall be provided with nonskid nosings or an integral abrasive in tread surface. Stairways that are part of the egress pattern shall have widths, run lengths, landings, treads, risers, handrails, guardrails, headroom, door sizes, door swings, door ratings, interior finishes, windows and other openings in accordance with NFPA 101 and NFPA 80.

Guideline notes:

- i Exit shall be either of horizontal or vertical type. An exit may be doorway, corridor and passageways to an internal staircase or external staircase, ramps or to verandah or terraces which have access to the street or to roof of a building. An exit leading to an adjoining building at the same level.
- ii Doors of small individual rooms such as offices are not considered as exits unless they actually lead directly to the open air.
- iii Doors of large rooms are considered to be exits.
- iv An interior passageway does not become part of an exit until it is enclosed as a fire compartment with at least half an hour fire resistance.
- Where an external stairway exists it shall be ensured that the use of it at the time of fire is not prejudiced by smoke and flame issuing from openings (e.g. Windows, doors) in the external face of the building.
- vi Internal stairways [as means of escape/egress] shall be suitably enclosed or protected as necessary to afford reasonable safety to occupants and to prevent spread of fire, smoke or fumes through the vertical stairway opening.
- vii Lifts, escalators, and revolving doors not to be considered as "EXITS."
- viii Adequate capacity of all escapes route paths/passageways.
- ix Protection for escape paths/passageways:-
 - Mark/signpost.
 - Mark exit paths/passageways clearly and light them.
 - Restrict fuel loads and finishes in exit paths/passageways.
 - Enclose stairways.
 - x Use construction barriers to keep fire out.
- xi Use smoke control methods to protect atmosphere in exit paths.
- xii Escape to outside or to protected place or adequate defense of places where occupants should

remain.

- xiii Avoidance of makeshift security arrangements.
- xiv Escape routes shall be lighted in such a manner that they can be used in a fire when a failure of a local electrical circuit is probable.
- xv Escape lighting shall be distinguished from the Emergency lighting which might be provided, on failure of a mains supply, by a standby generator. Such emergency lighting probably will not function in a fire due to local circuit failure and escape lighting shall be provided by self contained fittings which are capable of running for a set period of time. The provisions of NFPA 70 (Article 700) shall be complied with.
- xvi Escape lightings shall be provided / sited at but not limited to the following:
 - a) Each Exit Door.
 - b) Near Each Staircase So Each Flight Receives Direct Light.
 - c) Each Other Change of Floor.
 - d) Near Changes of Direction.
 - e) Near Each Intersection.
 - f) Near Each Fire Alarm Call Point.
 - g) Near Fire Fighting Equipment.
 - h) Outside Each Final Exit and Close to it.
 - i) Lift Cars.
 - j) Plant Rooms.

Escape lightings shall also be provided to illuminate exits and safety signs.

- xvii Egress lights are fixtures connected to normal power supply systems and are to functions at all times when the building is occupied.
- xviii Emergency lights or stand-by lights are normally battery-type emergency unit equipment that provides no illumination until failure of the egress lighting circuit. These units serve as a backup for egress lights.
- xix The colour of the exit signs shall be green.

SECTION 10 – MISCELLANEOUS

- 1. Criteria for storage configuration for JAFZA PBUs / LIUs. (Refer to Appendix -6)
- 2. <u>Hazardous Area Protection concerning Assembly Occupancies, Hotels and Dormitories:</u> Relevant provisions of NFPA 5000, 2006 (Sections 16.3.2.1.1 & 24.3.2.1) and NFPA 101 shall apply.

3. Building Rehabilitation

Relevant provision of NFPA 5000, 2006 (Chapter – 15) dealing with repair, renovation, modification, reconstruction, change of use and change of occupancy classification, addition, damaged or unsafe buildings, historic buildings & structures etc. shall apply.

4. Safeguards During Construction

- Relevant provisions of NFPA 5000, 2006 (Chapter 14) NFPA 241, NFPA 70 & NFPA 1 dealing with safeguarding construction, alteration, demolition operations, protection of utilities, temporary light & power and use of explosives etc. shall apply.
- ii. <u>Stop work</u>: The consultants shall be responsible for ensuring that the construction of buildings, facilities or structures is carried out in compliance with the required standards. They shall immediately stop the work when contrary is observed in order to (i) correct any deviation from the requirements of EHS-Fire Dept./ AHJ and (ii) correct or abate an unsafe condition posing significant risk of fire, explosion or accident.
- iii. The construction work that is not in conformance with the requirements of EHS-Fire Dept. / AHJ shall be subject to rectification which may include demolition.
- iv. <u>Removal of Construction Debris</u>: The consultants, Contractors & Sub-contractors shall ensure that all hazardous, Combustible and flammable construction debris are removed regularly from construction site and disposed of in accordance with the requirement of EHS Dept.
- 5. <u>Temporary buildings, facilities or structures at construction sites for the use of offices and</u> <u>labour accommodation:</u>
 - (i) Written request for approval of construction of temporary buildings, facilities or structures at construction sites shall be submitted to EHS-Fire Dept.
 - (ii) EHS-Fire Dept reserves the right to approve such buildings, facilities or structures.
 - (iii) (Refer H,S&F Guidelines).

6. <u>Covered temporary structures – Enclosed tents normally used for events/activities such as</u> <u>stage shows, concerts, circus, exhibitions, trade fairs, sporting events & celebratory</u> <u>functions:</u>

- (i) Written request for approval for construction of temporary structures shall be submitted to EHS-Fire Dept.
- (ii) EHS-Fire Dept reserves the right to approve such structures.

(iii) (Refer Appendix – 7)

7. Marinas and Boatyards:

Relevant provisions of NFPA 303 shall apply.

8. <u>Marine Terminals, Piers and Wharves:</u>

Relevant provisions of NFPA 307 shall apply.

9. Quality Assurance During Construction

Relevant provisions of NFPA 5000, 2006 (Chapter-40) shall apply.

Guideline Note:

Relevant chapters of NFPA 5000, 2006 dealing with energy efficiency, Elevators and conveying system, Plumbing system, Exterior wall construction, Interior Environment, High Hazard Contents, Structural Design; Soils, Foundations and Retaining Walls, Roof Assemblies and Roof Structures, Floor-Resistant Design & construction, Encroachments into the public Right-of-way, concrete, Aluminum, Masonry, Steel, Wood Glass and Glazing; Gypsum Board, Lath and Plaster and Plastics shall apply.

10. Performance Based Fire Safety Design:-

- i. Relevant provisions of NFPA 101, 2006 (Chapter -5) and of NFPA 5000, 2006 (Chapter 5) shall apply.
- ii. Performance-based fire safety design methods shall be applied to the renovation, restoration, remodeling or modernization of existing facilities to address the evaluation of a sub system, system or complete building when it is not possible to meet the provided prescriptive requirements for new construction.
- iii. New buildings, facilities or structures for which established prescriptive NFPA code criteria exist shall not be permitted to use performance-based fire and life safety design methods.
- iv. Performance-based fire safety design methods may be permitted by EHS-Fire Dept / AHJ for unique facilities where the user mandates requirements and objectives that are not addressed by established prescriptive requirements of NFPA codes or these regulations.
- Performance-based fire safety design methods shall not be used to eliminate required exiting requirements nor shall it be used to eliminate automatic sprinkler systems required by relevant NFPA codes.
- vi. Performance-based fire safety design report shall be prepared by the concerned fire protection expert / specialist indicating that the building, facility or structure was designed using a performance-based fire safety design approach as may permitted by EHS-Fire Dept / AHJ. It shall convey the expected hazards, risks and system performance over the entire building life-cycle. It shall also include the project scope, design goals and objectives, performance criteria, design fire scenarios, critical design assumptions, critical design features, final design, design engineer's qualifications & capabilities and data and evaluation method references.

11. Standby Power

- i. A stand-by emergency / electric generator shall be installed to provide power to staircase, emergency lighting systems fire lifts, fire pumps, pressurization fan and blowers, smoke extraction and damper system in case of failure of normal electrical supply. The generator shall be capable of taking starting current of all the machines and circuits stated above simultaneously.
- ii. Relevant provisions of NFPA 101, 110 & NFPA 111 shall apply.

12. Basements

- Relevant provisions of NFPA 5000, 2006 (Section 7.4.2.2, 4.2, 3.3.50, 3.3.50.1, 39.2.2, 7.4.3.6.5, 7.4.3.6.6, 30.8.3.5.2 & 55.3.1.7) shall apply. Also, sections 42.7.4, 42.7.4.2, and 42.8 through 42.9 concerning underground spaces shall apply.
- ii. The basement shall not be normally used for residential purposes.
- iii. The access to the basement shall be separate from the main and alternate staircase providing access and exit from higher floors. Where the staircase is in continuous the same shall be of enclosed type serving as a fire separation from the basement floor and higher floors. Open ramps shall be permitted if they are constructed within the building line subject to the condition that adequate arrangements are made to prevent entry of surface drainage into the basement.
- iv. Each basement shall be separately ventilated. The standard of ventilation shall be the same as required by the particular occupancy or relevant NFPA codes. Any deficiency shall be met by

providing adequate mechanical ventilation in the form of blowers, exhaust fans, air conditioning systems etc.

v. The basement shall not be partitioned.

13. Electrical Services / Systems:-

- i. Relevant provisions of NFPA 5000, 2006 (Chapter 52) shall apply.
- ii. The electrical distribution cables / wiring shall be laid in separate duct. The duct shall be sealed at every floor with non-combustible materials having the same fire resistance as that of the duct.
- iii. Water mains, telephone lines, gas pipes or any other service line shall not be laid in the duct for electrical cables.
- iv. Separate circuits for fire and other pumps, water pumps, lifts, staircases, and corridor lighting and pressurizing system shall be provided directly from the main switchgear panel.
- v. All electrical services shall be subject to DEWA approval.

14. Mechanical System: -

Relevant provisions of NFPA 5000, 2006 (Chapter-50) shall apply.

15. <u>Plenums</u>

Plenums may be used as an integral part of an air handling system only if they conform to the requirements of NFPA 90A. Under no circumstances shall combustible materials be located within the plenum space. Electrical wring passing through the space, including telephone and communication wiring, shall be approved for that type of environment or shall be in metal conduit. Rooms or areas which form a plenum space or which are used as a plenum must not be occupied for any purpose except during repairs or maintenance operations to the air handling equipment.

16. Transformers:

Indoor and outdoor transformers shall be installed and located in accordance with the requirements / standards of Dubai Electricity and Water Authority (DEWA)

17. <u>Stationery Combustion Engines, Gas Turbines and Generators:</u>

Engines, gas turbines and generators shall be installed in accordance with the requirement of NFPA 37.

18. Gas Service:

Gas service mains shall be installed in accordance with the requirements of NFPA 54 and NFPA 58 Gas Service mains shall not be permitted within the perimeter of foundation lines. Natural draft cross ventilation for building crawl spaces containing gas service piping shall be provided. Supply connections from the gas service mains above grade outside the foundation wall shall be raised and passed through a full swing joint or loop of metallic tubing before entering the building. This will avoid pipe rupture in the event of differential settlement or earthquake. Pressure regulators shall be located outside of buildings or vent to the outside.

19. Signboards and Nameplates for Company Premises:

- i. Developers / lessees / licensees are required to erect suitable signboards on their premises for which they are responsible. The design, size, colouring and location of the signboard must be approved by PCFC Civil Engg department.
- ii. Self-illuminated signs (e.g. Neon) are not normally permitted.

- iii. Written request for installation of self-illuminated signs, where justified, shall be submitted to EHS-Fire Dept.
- iv. EHS-Fire Dept reserves right to approve self-illuminated /neon signs.
- v. Signboards are not required for Office Lessees. However, Office Lessees are required to have a Nameplate installed, manufactured from 3mm thick Basss and grad conforming to American standard ASTM B26.This shall be located externally, adjacent to the office entrance.
- vi. In the event of relocating / vacating premises, all sign boards and nameplates must be transferred / removed by the developers / lessees / licensees.

20. Certification and Approval

- 1. All fire extinguishers and fixed fire fighting installations/systems, fire protection equipment & products shall conform to relevant NFPA and its companion codes, standards & publications and EHS-Fire Dept. requirements. They shall be of the types, make(s) and brand(s) having valid test certifications from accredited & approved test certification bodies. (Refer to EHS-Fire Dept. for more details).
- 2. Certification of completion pertaining to fire extinguishers and any fire protection installations / systems [including fire detection & fire alarm systems] shall be made in the prescribed formats (refer to EHS -Fire Dept. for more details) and submitted prior to building completion.

SECTION 11 - FIRE PREVENTION

- All developers, lessees and licensees shall be responsible for implementation of appropriate/necessary fire preventive measures, including housekeeping, at work places to prevent the outbreak of fires or explosions that could result in loss of valuable lives and property. The fire preventive measures shall include but not limited to precautions against (I) sources of ignition including heat transfer (ii) lightning (iii) spontaneous combustion (iv) explosions (v) flammable/combustible dusts, gases and vapours and wastes (vi) hazardous processes viz. Welding, cutting, grinding, blasting, chipping, scrapping etc. (vii) naked lights and flames (viii) hazardous chemicals posing flammability risks and prevention of fire spreading.
- 2. Relevant provisions of NFPA Fire Prevention code & NFPA Fire Prevention code Handbook shall apply.
- Relevant provisions of NFPA 303, Marinas and Boatyards, NFPA 307 Marina Terminals, Piers and Wharves and ISGOT (International Safety Guide for Oil Tankers & Terminals) shall apply where appropriate.
- 4. Cooking in the rooms of accommodation complexes in Free Zones & Economic Zones (other than the Senior Blocks where kitchen are provided) is prohibited.
- 5. Relevant provisions of DPA Oil & Chemical Pollution Plan shall apply.
- 6. Fire works displays and burning of fire crackers are prohibited; except from official events of PCFC subject to compliance with established protocols, SOPs and precautionary measures.

- 7. Setting of outdoor or indoor fire (including burning of wastes/rubbish) is prohibited; except for permitted fire places and fire training facilities.
- 8. Setting of recreational fire is prohibited; except for setting of small fire related to religious ceremonies may be permitted; for which written permission shall be obtained from EHS-Fire Dept. EHS-Fire Dept reserves the right to permit setting of such fire.
- 9. The act of setting fire willfully (i.e. an arson/incendiarism crime) is punishable and subject to Articles 304, 305, 306, 307 and 308 of the Penal Code for UAE. Developers / lessees / lincences shall ensure compliance with but not limited to the following measures to prevent the crime of arson / incendiarism:
 - i. Keep doors and windows locked when a building is unoccupied.
 - ii. Store all flammable liquids such as paints, gasoline and mowers in an approved storage location: locked cabinets, locked storage units, and locked garages.
 - iii. Report suspicious activity to the Police (999) or PCFC Security (8832200)
 - iv. If an arson / incendiarism crime has been committed or suspected to have been committed or suspected to be committed; and the suspect or the perpetrator of the crime is known, report the matter to the police (999), EHS Fire Department (8833111) or PCFC Security (8832200)
- 10. Developers / lessees / licensees shall comply with relevant provisions of NFPA 51B Fire Prevention During Welding, Cutting and Other Hot Work for carrying out hot work. Hot work permit procedures established by EHS Dept shall also be complied with where applicable.
- 11. In preparation of a space for hot work and to determine the nature and the extent of the hot work shipyard/ship repair personnel shall comply with but not limited to the following requirements as per NFPA 306:
 - i. Determine the nature and the extent of the hot work.
 - ii. Determine the nature of other operations in or adjacent to the space that may affecting hot work (such as painting and cleaning).
 - iii. Determine the cargo history, the last three cargos held in work space and adjacent spaces.
 - iv. Secure pipelines and other equipment (heating coils, pumps, etc.) in the work space to prevent flammable or toxic materials from being discharged into the space.
 - v. Make space "Safe for Workers", including spaces for entry & work, installing appropriate illumination, means of access (such as ladders), staging, etc.
 - vi. Post warning signs as appropriate.
 - vii. Install appropriate hot work ventilation.
 - viii. Before use, ensure that welding and burning equipment is properly grounded, inspected, and installed.
 - ix. Ensure that adequate fire protection is available.
 - x. Ensure that flammable, combustible, or toxic coatings (preservative coatings or insulation) have been removed from hot work surfaces.
- a) A shipyard competent person must perform testing on any surface of which the flammability is not known.
- b) Soft and greasy coatings must be adequately stripped back.
- c) Toxic preservative coatings must be stripped back at least 4 inches, otherwise airline respirators must be used.
- xi. Ensure that flammable and/or combustible materials (such as trash, rags, open containers of solvents, etc) have been removed from the area.
- xii. Ensure that flammable, combustible, or toxic cargo residues have been removed or are adequately covered.
- xiii. Ensure that all movable fire hazards including residues of combustible bulk cargoes in the vicinity have been removed from the hot work area.
- xiv. Ensure ventilation is adequate to maintain a safe atmosphere during hot work.
- xv. Ensure that adjacent spaces have been inspected and meet requirements for hot work.
 - a) In lieu of cleaning, adjacent spaces can be inerted.
- 12. Relevant provisions of NFPA 70 (dealing with electrical fire safety i.e. a zone hazardous area classification for reducing the risk of fire and electric shock hazards etc) shall apply. Fire risk prohibition safety signs to identify areas where smoking, naked flames, smouldering and glowing fires are prohibited shall be displayed in such classified areas conspicuously to avoid fire ignition or explosion.
- 13. No objection certificate (NOC) for building demolition may be issued by EHS-Fire Dept subject to compliance with but not limited to the following conditions: -
 - Prior to commencement of demolition, removal of potentially hazardous building components (hazardous waste consisted of toxic, flammable & combustible materials) for disposal or recycling shall be done with express permission from EHS Dept.
 - ii. Demolition work/activities shall be done in such a manner that the hazards from fire and explosion are minimized.
 - iii. A fire watch shall be provided throughout to watch for fires, make use of portable fire extinguishers or fire hose and perform similar fire prevention & protection duties.
 - iv. Special precautions must be taken when demolition work is being done in areas where floors are soaked with oil or other flammable liquid or where combustible insulation may be present in floors, walls or ceilings/roofs where hot work is being done.
 - v. Access to utilities including fire hydrants shall be kept unobstructed during demolition.
 - vi. All utilities, including gas, electric, water, telephone and cable shall be properly disconnected prior to commencement of demolition.
 - vii. Except for the owner, no person shall enter the demolition site/premises unless authorized to perform inspections, repairs or to demolish and remove the building/structure.

- viii. Demolition contractor and his personnel at the site shall have a direct method of notifying Fire Dept (8833111) in the event of an emergency.
- ix. Relevant provisions of NFPA 5000, 2006 (Chapter-14) NFPA 241, NFPA 70 & NFPA 1 shall apply where appropriate (Refer to section 4 of part 10 of these regulations).
- 14. Developers, lessees and licensees shall also ensure compliance with but not limited to the following DOs and Don'ts at work places:
 - i. Do not smoke in forbidden areas or in the areas not designated for smoking.
 - ii. Do not cook food in forbidden areas or in the areas not designated for cooking food.
 - iii. Avoid careless disposal of burning cigarette butts.
 - iv. Check ashtrays for smouldering cigarettes or other combustibles before closing down.
 - v. Do not let papers, rags or other rubbish accumulate at place of work.
 - vi. Use proper containers for flammable liquids, and not open tins or buckets.
 - vii. Handle flammable liquids at a safe distance from possible sources of ignition.
 - viii. Check before and after using blow lamps welding/cutting equipment.
 - ix. Do not overload electrical circuits.
 - x. Switch off from mains any electrical equipment when not in use.
 - xi. Check electrical cables, plug sockets, for damage/fraying.
 - xii. Wipe out spilled oil, grease or liquids.
 - xiii. Store tools safely when not in use.
 - xiv. Clear up turnings, chips or off-cuts.
 - xv. Use metal containers for oily or greasy rags, scraps and waste
 - xvi. Do not leave rubbish lying out.
 - xvii. Do not hang clothing over or near heating element
 - xviii. Avoid welding near flammable materials.
 - xix. When welding near flammable materials, beware of flying sparks and hot slag, keep fire extinguishers standby during welding/cutting work and check the area before leaving.
 - xx. Keep compressed gas cylinders away from sun, artificial heating, flammable materials, corrosive chemicals and fumes.
 - xxi. Do not obstruct access to Fire Extinguishers.
 - xxii. Make sure that you know the escape routes in case of fire.
 - xxiii. Keep fire escapes exits unobstructed.
 - xxiv. Ensure that all fire protection facilities are inspected / maintained / serviced Hose Reels (monthly), Fire Extinguishers and Fire Detector/Alarm System (quarterly).
 - xxv. Ensure that employees are trained in the use of Fire fighting equipment, Fire Action and Evacuation yearly basis.
- 15. All set-back areas, exits, exit access paths, staircases, fire routes and fire access paths shall be kept free of any obstructions, combustibles and flammables. Any objects or items, combustibles and

flammables occupying set-back areas or obstructing exits, exit access paths, staircases, fire routes and fire access paths shall be removed without prior notice by EHS-Fire Dept at the expenses of the concerned developers, lessees and licensees.

- 16. EHS-Fire Dept officers including Vice President/Chief Fire Officer and his deputy are authorized to enter and inspect, at all reasonable times, land and premises for the purposes of assessing fire safety (i.e. safety from the risk that a fire, if started, would seriously endanger the health and safety of any person or the quality of the natural environment). They may (i) examine a document or other thing that is relevant to the inspection (ii) demand the production for inspection of a document or other thing that is relevant to the inspection (iii) remove anything that is relevant to the inspection for review and examination and remove any document that is relevant to the inspection for review and copying (iv) conduct tests, take and remove samples, take photographs and make videotapes and other images, electronic or otherwise, that are relevant to the inspection & (v) question a person or persons on matters relevant to inspection. If they demand that a document or other thing be produced for inspection, the person who has the custody of the document or thing shall produce it and, in the case of a document, shall on request provide any assistance that is reasonably necessary to interpret the document or to produce it in a readable form. A document or thing that has been removed from land or premises shall be made available to the person from whom it was removed on request and at a time and place that are convenient for the person and for the EHS-Fire Dept officers; and shall if it is possible, to return the document or thing to the person, be returned within a reasonable time.
- 17. Incident of Fire/explosion taking place in the premises of developers, lessees and licensees shall be reported in the prescribed format (Refer Table 8, Part I). Investigation into the cause thereof shall be carried out by EHS-Fire Dept with the objective of implementing and/or enforcing appropriate and necessary corrective and preventive measures.

SECTION 12 - FIRE / EMERGENCY CONTROL

- **1**. All developers, lessees and licensees shall implement appropriate fire control measures in accordance with relevant provisions of these regulations.
- 2. Fire Emergency/Evacuation plan shall be in place and it shall be rehearsed/drilled at least annually. The plan shall be co-ordinate with PCFC Emergency Management Procedures / DPA Marine Emergency Plan (where appropriate) and updated suitably as may be necessitated by the changed requirements. The defined scope of work for developing site specific evacuation plan shall include but not limited to the following aspects / points:
 - i. Emergency Actions
 - ii. Plan Description
 - iii. Process

- iv. Emergency Reporting Procedures
- v. Alarm-system Description
- vi. Evacuation Policy
- vii. Exit Maps or Diagrams
- viii. Emergency Plan Training
- ix. Procedure for Sheltering in place
- x. Procedure People who remain in place
- xi. Procedure for Accounting for all personnel
- xii. Rescue and Medical Tasks
- xiii. Emergency Communication Plan
- It shall be ensured that employees are trained & certified in the use of Fire fighting equipment, Fire actions and Evacuation annually through approved fire training facility / institution. (Refer to Appendix 8)
- **4.** Every vertical way of exit and other vertical opening between floors of a building shall be suitably enclosed or protected, as necessary, to afford reasonable safety to occupants while using exits and to prevent spread of fire, smoke or fumes through vertical openings from floor to floor before occupants have entered exits.
- **5.** In every building, facility or structure, adequate and suitable portable fire extinguishers shall be provided to extinguish a minor fire. Also, every vehicle or mobile equipment such as forklift, crane and other similar ones shall be equipped with a fire extinguisher to extinguish a minor fire.
- **6.** EHS-Fire Dept shall be notified in writing of temporary shutdown or disablement of any fire protection system or installation against which implementation of appropriate countermeasures is necessary. Such countermeasures shall be recommended by EHS-Fire Dept for implementation by the concerned lessee/licensee.
- 7. Action to be taken in case of fire.
 - i. Raise Alarm By actuating Fire Alarm System or by shouting FIRE......FIRE......FIRE......
 - ii. Attack the fire By using available Fire Extinguishers, if possible.
 - iii. Inform PCFC Fire Emergency Control Room (Tel: 8833111).
 - iv. Evacuate building and assemble outside in case the fire is going out of control. (Senior officer present to take charge, direct the evacuation and account for all occupants of the building).
 - v. Do not re-enter the building until declared safe by EHS-Fire Department.

Note: Actions i to iii must be taken to avoid delays

8. No parking of vehicles or trailers is permitted along fire routes / fire access paths / set-back areas. Vehicles or trailers parked or left along any of the fire routes / fire access paths / set-back areas shall be removed without any/prior notice by EHS-Fire Dept at the expenses of the owners of such vehicles or trailers.

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- **9.** All set-back areas shall be kept free from/of obstructions, combustibles and flammables to maintain necessary and natural fire break.
- 10. All buildings, facilities or structures shall be accessible to fire and other emergency vehicles.
- **11.** Relevant provisions of PCFC Emergency Management Procedures and DPA Marine Emergency Plan shall apply.
- **12.** All PCFC Security/DSS and Dubai Police personnel are authorized to aid/assist EHS-Fire Dept personnel (Fire Fighting & Ambulance staff and officers including Vice President/Chief Fire Officer and his deputy) in the execution of their duties so that any measures that may appear to be expedient for the protection of life and property can be taken speedily. They may barricade the fire scene and also close any road/street in or near which the fire scene exists; and remove any persons [be they PCFC or non-PCFC employees/personnel] who, by their presence, behavior and actions, may interfere with the operations of EHS-Fire Department.
- 13. Licensees of custom-built premises shall ensure that effective Fire Protection Systems including automatic fire detection and alarm systems, complying with the requirements of EHS-Fire Dept / AHJ (refer to EHS-Fire Department for details), are installed and that the dedicated telephone connection is also made to the Central Fire & Security Monitoring Station at PCFC Emergency Control Centre (ECC). Such systems (i) must be regularly maintained and kept in good repairs and satisfactory working conditions at all times and (ii) must ensure avoidance of false alarms / calls. (Refer to Appendix 9 for guidance).
- 14. EHS-Fire Dept personnel (fire fighting staff including officers, Vice President/Chief Fire Officer and his deputy) are authorized to take full control of fire & non-fire emergency situations in their operational jurisdiction/turnout areas. Where a Client's premises are unmanned / unguarded / closed / locked, the Fire Dept personnel are authorized to make forced entry where there is reasonable justification (including a subsequent false alarm discovery), and / or where failure to do so could result in significant losses.
- **15. E**HS- Fire Dept personnel (fire fighting & ambulance staff and officers including Vice President/Chief Fire Officer and his deputy are authorized to enter on land or premises:
 - a. that are adjacent to the lands or premises on which a fire or emergency has occurred or is occurring for the purpose of fighting the fire or for providing rescue or emergency services; or
 - b. that are adjacent to the lands or premises on which there is a serious threat to the personal safety of any person for the purpose of removing or reducing the threat.
- **16.** EHS-Fire Dept personnel (fire fighting & ambulance staff and officers including Vice President/Chief Fire Officer and his deputy) are authorized to enter on land or premises on which a fire is occurring or that are adjacent to those lands or premises, for the purpose of pulling down or removing structures or things on or attached to the lands or premises on which a fire is occurring or that are adjacent to those lands or premises on which a fire is occurring or that are adjacent to those lands or premises on which a fire is occurring or that are adjacent to those lands or premises if, in the opinion of fire officer in charge, it is necessary to do so to prevent the spread of the fire.

- 17. EHS-Fire Dept personnel (fire fighting and ambulance staff and officers) may be authorized by the Vice President / Chief Fire Officer or his deputy to enter on lands or premises that are outside their operational jurisdiction / turnout areas for the purposes of fighting a fire or for providing rescue or emergency services on such lands or premises if:
 - **a)** in the opinion of Vice President / Chief Fire Officer or of his deputy the fire or emergency threatens persons, property or the environment and
 - **b)** the emergency response capability of the fire department or civil Defense serving the area in which such lands or premises are situated is not immediately available or is reported to be deficient and assistance of EHS-Fire Dept has been requested by such fire department / civil defence or police.
- **18.** EHS-Fire Dept personnel (fire fighting staff and officers including Vice President/Chief Fire Officer and his deputy) are authorized to enter on land or premises if:
 - a) A fire has occurred on the land or premises or
 - **b)** They have reasons to believe that a substance or device that is likely to cause a fire may be situated on the land or premises

Upon entering on the land or premises EHS-Fire Dept officers, including Vice President/Chief Fire Officer and his deputy, may order to: -

- a) close and prevent entry to the land or premises for the length of time necessary to complete the examination of the land or premises,
- **b)** remove from the land or premises, retain and examine any article or material and take such samples or photographs, make videotapes and other images electronic or otherwise that in their opinion may be of assistance in determining the cause of the fire under investigation.
- c) Make such evacuation on the land or premises as they consider necessary
- d) Operate, use or set in motion any machinery, equipment or device
- e) Make any reasonable inquiry of any person or persons orally or in writing.
- **19.** EHS-Fire Dept personnel (fire fighting staff and officers including Vice President/Chief Fire Officer and his deputy) are authorized to enter on land or premises if the entry is necessary for the purpose of conducting an investigation into the cause of a fire or for determining whether a substance or device that is likely to cause fire is situated on the land or premises.
- **20.** EHS-Fire Dept personnel (fire fighting & ambulance staff and officers including Vice President/Chief Fire Officer and his deputy) are authorized to enter waters or board ship, vessel or craft for the purpose of fighting a fire or for providing rescue or emergency services in compliance with the provisions of DPA Marine Emergency Plan.
- 21. Emergencies involving hazardous materials shall be dealt with by EHS-Fire Dept in accordance with all established Standard Operating Procedures (SOPs) as set forth in (i) Procedure for Emergency Preparedness Response Planning & Execution (PCFZ-EMS-EPR-001) & (ii) relevant NFPA codes and standards.
- **22.** Any accidental/incidental damage caused or occasioned by EHS-Fire Dept staff (Fire Fighting & Ambulance personnel) in the due execution of their duties must be deemed/construed to be the damage caused by fire. No claim shall lie against EHS-Fire Dept / AHJ, EHS Dept or any other

departments of PCFC and their directors, officers and other concerned personnel for compensation for any damage so and necessarily caused. (Refer to section 15 of Part 1 of these regulations.).

SECTION 13 - CERTIFICATION AND APPROVAL

- All fire extinguishers and fixed fire fighting installations/systems, fire protection equipment & products shall conform to relevant NFPA and its companion codes, standards & publications and EHS-Fire Dept. requirements. They shall be of the types, make(s) and brand(s) having valid test certifications from accredited & approved test certification bodies. (Refer to EHS-Fire Dept. for more details).
- 2. Certification of completion pertaining to fire extinguishers and any fire protection installations / systems [including fire detection & fire alarm systems] shall be made in the prescribed formats (refer to EHS -Fire Dept. for more details) and submitted prior to building completion.

SECTION 13 - APPENDICES

- Appendix 1 Submittal Requirements for obtaining Building Permit, Completion Certificate and approvals related thereto.
- Appendix 2 Fire Protection / Fire Safety Guidelines for Designing High Rise Buildings
- Appendix 3 Dimensional criteria concerning Fire escape stairs, exit widths etc.
- Appendix 4 Occupant load factor
- Appendix 5 Common path, Dead-End and Travel Distance limits
- Appendix 6 Criteria for storage configuration for JAFZA PBUs / LIUs
- Appendix 7 EHS-Fire Dept requirements for Covered temporary structures Enclosed Tents normally used for events/activities such as stage shows, concerts, circus, exhibitions, trade fairs, sporting events & celebratory functions.
- Appendix 8 Fire Training Requirements
- Appendix 9 Avoidance of False Alarms from Automatic Smoke Detectors



<u>APPENDIX – 1</u>

a) <u>Submittal Requirements (design drawings & other details) for Obtaining Building Permit,</u> <u>Completion Certificate and approvals related thereto.</u>

1. For obtaining a Building Permit for development in a leased plot within PCFC jurisdiction.

The consultant shall submit the following drawings (both soft + hard copies):

- ✓ Site setting out plan shall clearly identify the location of Fire pumps, access for emergency services, fire water tanks and other utilities services 1 Set.
- ✓ Architectural drawings 1 Set
- ✓ Fire layout drawings 2 Sets
- ✓ Proposed usage of building 1Set
- ✓ Process details, Pipeline & Instrumentation (P&I) diagram 1 Set (Only for Manufacturing & process industries, tank farms, spheres, bullets, liquid & gas storage tanks, boilers & pressure vessels, gas distribution systems, petrol, oil & chemical distribution systems / pipelines)

2. For obtaining a Building Permit for minor modifications on a Leased Plot within PCFC jurisdiction

The consultant shall submit the following drawings (both soft + hard copies): Fire layout drawings - 2 Sets

General Guidelines

- a) Setting out plan shall clearly identify any additional services.
- b) Complete existing floor plans with the proposal identified clearly shall be submitted.
- c) Detailed plan, elevation, and section for the proposed modification shall be submitted
- d) Fire fighting layout drawing shall clearly show smoke detectors, hydrant/Fire hose reels, Fire extinguishers, fire alarm bells, break glass units, Fire exit doors/Fire rated doors & Emergency lights location/relocation.

3. For obtaining a NOC for Modification in JAFZA's Pre-Built Warehouse Units.

The consultant shall submit the following drawings: Fire layout drawings – 2 Sets Brief write up of the usage of area, Process detail, Project brief.

General Guidelines

- a) Floor plan shall clearly show existing & proposed additional offices with all dimensions. Proposed partitions shall be clearly identified.
- b) Detailed plan, elevation, and section for the proposed partitions with clear details of windows, air ventilation, etc shall be submitted.
- c) Fire fighting layout drawing shall clearly show smoke detectors, fire extinguishers, hydrant/hose reels, fire alarm bells, break glass units, Fire Exit doors/Fire rated doors & Emergency lights location/relocation.

4. For obtaining a NOC for Modification in JAFZA's Lease Office Buildings (LOBs)

The consultant shall submit the following drawings: Fire Layout Drawings – 2 sets

General Guidelines

- a) Complete existing floor plans with proposed partitions identified clearly.
- b) Detailed plan, elevation, and section for the proposed partitions with clear details of windows, air ventilation, etc.
- c) Fire fighting layout drawings shall clearly show smoke detectors, Bells, break glass units, fire extinguishers, Fire Exit Doors / Fire rated doors & Emergency lighting etc location/relocation.

4. For obtaining Building Completion Certificate for development on a leased plot within PCFC jurisdiction.

The consultant shall submit the following As Built drawings (both Soft + Hard copies): Site layout – 1 Set Fire Protection layout – 1 Sets Completion Certificate for installation, Commissioning & testing of Fire alarm & protection. (Refer to EHS website: www.ehss.ae for format) – 1Set

5. For obtaining Building Completion Certificate for modification in JAFZA's Pre-built warehouse units.

The consultant shall submit the following As Built drawings (both Soft + Hard Copies): Fire Protection layout – 1 Sets Completion Certificate for installation, Commissioning & testing of Fire alarm & protection. (Refer to EHS website: www.ehss.ae for format) – 1Set

- <u>Note</u>: (i) The term Design drawings means Basic Design drawings meeting NFPA/JAFZA requirements approved during the process of obtaining NOC for Building Permit.
 - (ii) The consultants shall secure all unknown information from EHS-Fire Dept prior to submittal of plans / drawing.
 - (iii) Any information not submitted initially will cause delay in the review time of submitted plans and may lead to disapproval of a plan/drawing.

b) For approval of Shop Drawings.

The term Shop Drawings means drawings and technical data concerning any fire protection system or equipment that are required to be submitted to EHS-FIRE DEPT for approval, by the *authorized Contractor or subcontractor showing in detail (1) the proposed fabrication and assembly of the system components and (2) the installation (e.g., form, fit, and attachment details) of materials and equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, catalog cuts, illustrations, schedules, operations and maintenance manuals, performance and test data, and similar materials furnished by the Contractor or subcontractor to explain in detail, specific portions of the work required by the contract.

The Contractor or subcontractor shall submit Shop Drawings as detailed below.

- Two (2) reproducible sets and four (4) copies of all drawings (such as fabrication and installation drawings, layouts, schematics) and six (6) copies of all technical data
- The Shop Drawings shall be complete and detailed, including the original equipment manufacturer's
 names and part numbers, and shall contain all information required for checking without reference to
 material contained in other Shop Drawing transmittals. Partial submittals will not be accepted unless
 specifically approved by the consultant. Any partial submittals shall be so indicated and any
 outstanding submittal required to complete the package shall be identified.
- Shop Drawings shall be submitted in a logical sequence that is duly coordinated with long lead time procurements and with fabrication and construction schedules.
- Shop Drawings shall be of a type suitable for microfilming and reproduction and shall be of a quality to produce clear, distinct lines and letters. All drawings shall have dark lines on a white background.
- Shop Drawings shall be uniform in A0 size and folded to A4 in Size.
- Shop Drawings shall be numbered in logical sequence. The Contractor or subcontractor may use his own numbering system. Each drawing shall bear the number of the submittal (e.g. Submittal #1, Submittal #2, etc.) in a uniform location adjacent to the title block. Any re-submittals shall retain the same submittal number with the revision designated (e.g. Submittal #1, Rev. A).
 - A blank space, no smaller than 4 by 5 inches shall be reserved on the right hand half of each sheet for the EHS-FIRE DEPT disposition stamp.
 - Along with shop drawings, Equipment submittals related to Fire Alarm, Communication, Emergency lighting & Fire Suppression Systems shall be submitted for approval based on which materials shall be procured.

- Review and approval notation will be as follows:
 - Shop drawings marked "approved" authorize the Contractor or subcontractor to proceed with work covered by such drawings.
 - Shop drawings marked "approved as noted" authorize the Contractor or subcontractor to proceed with the work covered, provided he takes no exception to the notations. The notes shall be incorporated on the Shop Drawings prior to submission of the final Shop Drawings.
 - Shop drawings marked "returned for corrections" require the Contractor or subcontractor to make necessary corrections and revisions on the drawings and to re-submit them for approval in the same route as before, prior to proceeding with any of the work depicted on the drawings.
 - Shop drawings marked "not approved" or "disapproved" indicate noncompliance with the contract requirements and the Shop Drawings shall be re-submitted with appropriate changes. No item of work requiring a Shop Drawing shall be accomplished until the drawings are approved or approved as noted.
 - The Contractor or subcontractor shall make any corrections required by the consultant. Approval of the Shop Drawings by EHS FIRE DEPT Engineering shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is satisfactory. The Contractor or subcontractor shall be responsible for the dimensions and design of adequate connection details and satisfactory construction of all work.
 - Whenever the Contractor or subcontractor's Shop Drawings contain any changes or deviations from technical requirements of the applicable contract drawings, maps and specifications, they shall be clearly identified on the Shop Drawings concerned. All Shop Drawings containing deviations must be accompanied by a Deviation note.
 - If changes are necessary to approved Shop Drawings whether as a result of a contract change or for any other reasons, the Contractor or subcontractor shall make such revisions and submission of the Shop Drawings. No item of work requiring a Shop Drawings change shall be accomplished until the changed Shop Drawings are approved.

c) Fit out Works Requirements:

Fire Protection / Safety Systems fit out works shall include adjustment of the base building fire protection / safety systems to suit specific floor and room layouts as below:-

1. Automatic Detection System:

- i. Smoke detectors that need to be installed additionally should preferably be of conventional photoelectric type or smoke detector of the type(s) compatible either with the existing system(s) or with the legitimate ambient environmental conditions shall be installed.
- ii. Additional smoke detectors must be programmed to the existing main fire alarm panel.
- iii. Ceiling voids exceeding 800mm. must be installed with smoke detectors.
- iv. LIU'S (Light Industrial Units) Office extension floor area 50% and above: Existing fire alarm/detection installation in the warehouse area shall be discontinued [as it likely that the proposed office extension could either impede/obstruct maintenance/testing of the (ceiling) smoke detectors or render the detectors ineffective or both] and "Beam" type detectors shall be installed in replacement thereof.
- v. Fire escape door with **push bar to open** outward is recommended.
- 2. Sprinkler System:

All Extended sprinkler piping network must be subjected to Hydraulic/pressure testing and certificates to that effect needs to be furnished for Fire Dept approval and records.

Life Safety:

The occupant load/number of persons permitted inside the area allotted/leased out to the prospective clients must be compliant to the NFPA 101 refer Appendix - 6

Guideline Notes:

- * 1. The term "Authorized contractor or subcontractor" means the contractor or subcontractor expressly authorized by the consultant to prepare and submit shop drawings directly to EHS Fire Dept for approval.
 - 2. The approved stamped set of plans / drawings shall remain on the job site until final inspection is performed by EHS-Fire Department. All plans / drawings shall be readily available for inspection by EHS-Fire Dept.
 - 3. Drawing Review fees: Refer to EHS Department
 - 4. Re-inspection fees: No fee shall be charged by EHS-Fire Dept for initial [first & second] inspections for BCC/OFC. Fees shall be charged for each subsequent inspection for BCC/OFC (Refer to EHS Dept for details concerning fees).
 - 5. Refer to EHS website www.ehss.ae

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<u>APPENDIX-2</u> <u>Fire Protection / Fire Safety Guidelines For Designing High Rise Buildings</u>

MAJOR FIRE PROTECTION FACTORS IN HIGH RISE BUILDINGS

1. Accessibility a major issue

- 1.1 Limit of available ladders to reach upper floors
- 1.2 Height of the fire and high logistical demand
- 1.3 Inherent delays in deploying equipment and fire fighters affecting fire growth indirectly.
- 1.4 Fire Dept's inability to approach the origin of the fire from more advantageous directions (resulting in large or unacceptable losses).

2. Unique people movement & egress systems

- 2.1 Limited means of egress
- 2.2 Conventional exit system / stair towers cannot handle the accumulated effect of floor-upon-floor evacuation of occupants into the same exit system at the same time exceeding evacuation time.
- 2.3 To mitigate evacuation issues the concepts such as areas of refuge, defend-in-place, pressurized exits, enclosed/pressurized elevators, increased fire ratings, communication systems and life support systems shall apply.

3. Increased Occupant, equipment material and fuel load(s)

- 3.1 Higher density of occupant & fuel load is the result of stacking many floors on the same building foot print.
- 3.1 Fire has a natural tendency to move upward, where additional occupants and fuel are stacked.

4. Combination of occupancies in a single high-rise building

- 4.1 Combination occupancies range from residential to business, offices, stores, restaurants and places of assembly including underground parking located below the high-rise structure.
- 4.2 Many designs include within-the-structure atriums, building inter-connections and public transportation systems such as trains & sub-way service
- 4.3 These (mixed) occupancies & structures complicate the requirement for fire protection necessitating a sophisticated & complex approach to fire safety.

5. Natural forces affecting fire and smoke movement

- 5.1 Stack effect and the impact of winds can be very significant / different
- 5.2 No manual fire fighting techniques are available / known to counter stack effect that may vary with climatic condition.
- 5.3 The following design features are recommended [but not limited to] to minimize the stack effect:
 - (a) Air tight compartmentation from wall to wall. This would involve sealing penetration and exterior building tightness.
 - (b) Limiting continuous shaft heights. Construction of air-lock vestibules on stairs, elevators and other vertical shafts.
 - (c) Use of vestibules and gasketing on exterior doors at both the bottom and top of a building.
 - (d) Eliminating naturally ventilated shafts and floors that could contribute to stack effect during a fire. One of the most commonly encountered situation is elevator shafts with normally open vents. These designs should be active so that the venting will terminate during a fire, thus reducing the impact of shack effect.
 - (e) Zone compartmentation and control of mechanical systems, which could contribute to, or be affected by stack effect.
 - <u>Note:</u> (i) Ability to overcome the wind/stack effect is based upon many variables including system design, system power, tightness of the building, wind velocity and wind direction. Wind direction can complicate the accessibility and preferred direction of fire attack and can

increase fire and smoke impingement upon areas of refuge, possibly exceeding their design criteria.

6. Internal Utility Services

- 6.1 Equipment or mechanical levels servicing every ten or so floors
- 6.2 Multiple levels of fire pumps, addition pressure reducing devices or sprinkler and standpipe systems.
- 6.3 Zoned & compartmented HVAC systems sharing common exhaust shafts and fresh air intake shafts. These shafts and duct runs often penetrate multiple fire zones and require special attention regarding design and protection. Many high-rise buildings integrate smoke management systems into their conventional HVAC systems. Although this is acceptable; and in many cases preferred, it requires special design considerations, including safe and adequate controls, acceptance testing and on-going maintenance.
- <u>Note:</u> NFPA 101, 2006 Life Safety Code, includes specific requirements for high-rise buildings, including automatic sprinkler protection, detection, alarm, communications, emergency power systems and command stations. Other special features such as atriums and mixed occupancies are also addressed in NFPA 101, 2006.

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APPENDIX -3

a) Relevant Excerpts from NFPA 101, 2006

Feature	Serving More than 10 Occupants	Serving 10 or Fewer Occupants
Minimum widths	22 in. (560 mm) clear between rails	18 in. (455 mm) clear between rails
Minimum horizontal dimension of any landing or platform	22 in. (560 mm) clear	18 in. (455 mm) clear
Maximum riser height	9 in. (230 mm)	12 in. (305 mm)
Minimum tread, exclusive of nosing	9 in. (230 mm)	6 in. (150 mm)
Minimum nosing or projection	1 in. (25 mm)	No requirement
Tread construction	Solid ¹ / ₂ in. (13 mm) diameter	Flat metal bars on edge or
	perforations permitted	square bars secured against turning, spaced 1 ¹ / ₄ in. (32 mm) maximum on centers
Winders	None	Permitted subject to capacity penalty
Risers	None	No requirement
Spiral	None	Permitted subject to capacity penalty
Maximum height between landings	12 ft (3660 mm)	No requirement
Headroom, minimum	6 ft 8 in. (2030 mm)	6 ft 8 in. (2030 mm)
Access to escape	Door or casement windows, 24 in. x 6 ft 8 in. (610 mm x 1980 mm); or double-hung windows, 30 in. x 36 in. (760 mm x 915 mm) clear opening	Windows providing a clear opening of at least 20 in. (510 mm) in width, 24 in. (610 mm) in height, and 5.7 ft ² (0.53 m ²) in area
Level of access opening	Not over 12 in. (305 mm) above floor; steps if higher	Not over 12 in. (305 mm) above floor; steps if higher
Discharge to ground	Swinging stair section permitted if approved by authority having jurisdiction	Swinging stair, or ladder if approved by authority having jurisdiction
Capacity	¹ / ₂ in (13 mm) per person, if access by door; 1 in (25 mm) per person, if access by climbing over windowsill	10 persons; if winders or ladder from bottom balcony, 5 persons; if both, 1 person

Table	7.2.8.4.1(a)	Fire	Escape	Stairs
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Table 7.2.2.2.1.1(a) New Stairs

	Dimensional Cr	iteria
Features	ft/in.	mm
Minimum width	Sec 7.2.2.1.2	
Maximum height of risers	7 in.	180
Minimum height of risers	4 in.	100
Minimum tread depth	11 in.	280
Minimum headroom	6 ft 8 in.	2030
Maximum height between	12 ft	3660
landings		
Landing	Sec 7.2.1.3, 7.2.1.4.4	
	and 7.2.2.3.2	

Table 7.2.2.2.1.1(b) Existing Stairs

Dimensional Criteria							
Features	ft/in.	mm					
Minimum width clear of all obstructions, except projections not more than 4½ in. (114mm) at or below handrail height on each side	36 in.	915					
Maximum height of risers	8 in.	205					
Minimum tread depth	9 in.	230					
Minimum headroom	6 ft 8 in.	2030					
Maximum height between landings	12 ft	3660					
Landing	Sec 7.2.1.3 and 7.2.1.4.4						

Table 7.2.2.1.2 (B) New Stair Width

Total cumulative Occupant Load Assigned to the Stair	Width
<2000 persons	44in. (1120 mm)
>2000 persons	56in. (1420 mm)

Sections 7.2.2.2.1.2 – (A), (B), (C), (D), (E) & (F) of NFPA101, 2006, shall be referred to while calculating the minimum stair width.

In general, minimum stair width shall be derived from

Maximum Occupant Capacity for any given floor	Х	Egress Capacity factor	
(Gross floor area / Occupant load factor. Table 7.3	.1.2	(Table 7.3.3.1 of NFPA 101, 20	06)
of NFPA101, 206)			

<u>Exit width</u>: The width of an exit passageway, shall be adequate to accommodate the aggregate required capacity of all exits that discharge through it, unless one of the following conditions applies:

(1) *Where an exit passageway serves occupants of the level of exit discharge as well as other stories, the capacity shall not be required to be aggregated.

(2) As provided in Chapter 36 and Chapter 37 of NFPA 101, 2006 an exit passageway in a mall building shall be permitted to accommodate occupant loads independently from the mall and the tenant spaces. (see 36.2.2.7.2 and 37.2.2.7.2).

Note: NFPA 101, 2006 shall be referred to for additional information / details.

b) <u>Other examples of Minimum width of escape routes, exits and minimum numbers of exits from large spaces (where appropriate and necessary, EHS-Fire Dept shall insist upon compliance with these requirements)</u>

Minimum Widths of Escape Routes And Exits					
No. of People Width of Exits					
1 to 50	800mm				
51 to 110	900mm				
111 to 170	1000mm				
171 to 220	1100mm				
221 to 240	1200mm				
241 to 260	1300mm				
261 to 280	1400mm				
281 to 300	1500mm				
301 to 320	1600mm				
321 to 340	1700mm				

Minimum Numbers of Exits from Large Spaces					
No. of People	Number of Exits				
1 to 50	1				
51 to 500	2				
501 to 1000	3				
1001 to 2000	4				
2001 to 4000	5				
4001 to 7000	6				
701 to 11000	7				

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<u>APPENDIX – 4</u>

Relevant Excerpts from NFPA 101, 2006 Table 7.3.1.2

SI	lise	Factor				
No.		(ft ² per person) ^a	(m ² per person) ^a			
	Assembly Use					
1	(i) Concentrated use without fixed seating	7 net	0.65 net			
	(ii) Less concentrated use, without fixed seating.	15 net	1.4 net			
	(iii) Bench-type seating	1 person/18 linear in.	1 person/ 455 linear mm			
	(iv) Fixed seating	Number of fixed seats	Number of fixed seats			
	(v) Waiting spaces	See 12.1.7.2 and 13.1.7.2.	See 12.1.7.2 and 13.1.7.2			
	(vi) Kitchens	100	9.3			
	(vi) Library stack areas	100	9.3			
	(vii) Library reading room	50 net	4.6 net			
	(viii) Swimming pools	50 (water surface)	4.6 (water surface)			
	(ix) Swimming pool decks	30	2.8			
	(x) Exercise rooms with equipment	50	4.6			
	(xi) Exercise rooms without equipment	15	1.4			
	(xii) Stages	15 net	1.4 net			
	(xiii) Lighting and access catwalks, galleries, gridirons	100 net	9.3 net			
	(xiv) Casinos and similar gaming areas	11	1			
	(xv) Skating rinks	50	4.6			
2	Educational Use					
	(i) Classrooms	20 net	1.9 net			
	(ii) Shops Jaboratories vocational rooms	50 net	4.6 net			
3	(ii) Shops, laboratories, vocational rooms	35 net	3 3 net			
		55 Het	5.5 Het			
4	Health Care Use					
	(i) Inpatient treatment departments	240	22.3			
	(ii) Sleeping departments	120	11.1			
	(iii) Ambulatory health care	100	9.3			
5	Detention and Correctional Use	120	11.1			
6	Residential use					
	(i) Hotels and dormitories	200	18.6			
	(ii) Apartment buildings	200	18.6			
	(iii) Board and care, large	200	18.6			
7						
l '	(i) Concerned and high beyond industrial	100	0.7			
	(i) General and high-hazard industrial		9.5			
	(ii) Special-purpose industrial	100				
8	Business Use	100	9.5			
9	Storage Use					
	(i) In storage occupancies	NA	NA			
	(ii) In mercantile occupancies	300	27.9			
	(iii) In other than storage and mercantile occupancies	500	46.5			
10	Mercantile Use					
	(i) Sales area on street floor	30	2.8			
	(ii) Sales area on two or more street floors	40	3.7			
	(iii) Sales area on floor below street floor	30	2.8			
	(iv) Sales area on floors above street floor	60	5.6			
	(v) Floors or portions of floors used only for offices	See business use.	See business use.			
	(vi) Floors or portions of floors used only for storage,	300	27.9			
	receiving, and shipping, and not open to general public (vii) Mall buildings	Per factors applicable to use	Per factors applicable to use of space			
		of space				
	Note: NFPA 101 2006 shall be referred to for additional inform	nation / details				

<u>APPENDIX – 5</u>

Relevant Excerpts from NFPA 101, 2006

Table A.7.6 Common Path, Dead-End, and Travel Distance Limits (by occupancy)

Common Path Limit			Dead-End Limit				Travel Distance Limit					
	Unspr	inklered	Sprin	klered	Unspr	inklered	Sprin	klered	Unspr	inklered	Sprink	dered
Type of Occupancy	п		IL.		п		п		IL	111	п	
Assembly New	20/75	6.1/23	20/75	6.1/23	20	6.1	20	6.1	1501	45	250	76
Existing	20/75	6.1/23	20/75	6.1/23	20	6.1	20	6.1	150	45	250	76
Educational New	75	23	100	30	20	6.1	50	15	150	45	200	61
Existing	75	23	100	30	20	6.1	50	15	150	45	200	61
Day Care New	75	23	100	30	20	6.1	50	15	150	45	200	61
Existing	75	23	100	30	20	6.1	50	15	150	45	200	61
Health Care New	NR	NR	NR	NR	30	9.1	30	9.1	NA	NA	200	61
Existing	NR	NR	NR	NR	NR	NR	NR	NR	150	45	200	61
Ambulatory Health Care	75	23	100	30	20	6.1	50	15	150	45	200	61
Existing	75	23	100	30	50	15	50	15	150	45	200	61
Detention & Correctional New-Use Condition II, III, IV	50	15	100	30	50	15	50	15	150	45	200	61
New-Use Condition V	50	15	100	30	20	6.1	20	6.1	150	45	200	61
Existing –Use condition II, III, IV. V	50	15	100	30	NR	NR	NR	NR	150	45	200	61
Residential One-and two-family dwellings	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lodging or rooming houses	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
<i>Hotels and dormitories</i> New	35	10.7	50	15	35	10.7	50	15	175	53	325	99
Existing	35	10.7	50	15	50	15	50	15	175	53	325	99
<i>Apartments</i> New	35	10.7	50	15	35	10.7	50	15	175	53	325	99
Existing	35	10.7	50	15	50	15	50	15	175	53	325	99
<i>Board and care</i> Small, new and existing	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Large, new	NA	NA	125	38	NA	NA	50	15	NA	NA	325	99
Large, existing	110	33	160	49	50	15	50	15	175	53	325	99
Mercantile Class A. B. C. New	75	23	100	30	20	6.1	50	15	150	45	250	76
Existing	75	23	100	30	50	15	50	15	150	45	250	76
Open air	NR	NR	NR	NR	0	0	0	0	NR	NR	NR	NR
<i>Mall</i> New	75	23	100	30	20	6.1	50	15	150	45	400	120
Existing	75	23	100	30	50	15	50	15	150	45	400	120
Business New	75	23	100	30	20	6.1	50	15	200	61	300	91
Existing	75	23	100	30	50	15	50	15	200	61	300	91
Industrial General	50	15	100	30	50	15	50	15	200	61	250	75
Special purpose	50	15	100	30	50	15	50	15	300	91	400	122
High hazard	0	0	0	0	0	0	0	0	0	0	75	23
Aircraft servicing hangars, ground	50	15	100	30	50	15	50	15	note1	note1	note1	note
Servicing nangars, Mezzanine floor	50	15	/5	25	50	15	50	15	/5	23	/5	23
Storage Low hazard	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ordinary hazard	50	15	100	30	50	15	100	30	200	61	400	122
High hazard	0	0	0	0	0	0	0	0	75	23	100	30
Parking structures, open	50	15	50	15	50	15	50	15	300	91	400	122
Parking structures, enclosed	50	15	50	15	50	15	50	15	150	45	200	60

Aircraft servicing hangars,	50	15	100	30	50	15	50	15	note1	note1	note1	note
Aircraft servicing hangars, mezzanine floor	50	15	75	23	50	15	50	15	75	23	75	23
Underground spaces in grain elevators	50	15	100	30	50	15	100	30	200	61	400	122
Note: NFPA 101. 2006 shall be referred to for additional information / details.												

APPENDIX-6

EHS- FIRE DEPARTMENT



STORAGE HEIGHT = 3.5M

other than the one(s) specified above; and (2) The mandatory requirement of sprinkler system shall apply axiomatically when the activities [other than storage] that considerably increase the ignitability and fire-spread potential of the commodities are involved and/or the storage height exceeds 3.5 meters.

<u>APPENDIX - 7</u>

EHS-FIRE REQUIREMENTS FOR COVERED TEMPORARY STRUCTURES -ENCLOSED TENTS NORMALLY USED FOR EVENTS/ACTIVITIES SUCH AS STAGE SHOWS, CONCERTS, CIRCUS, EXHIBITIONS, TRADE FAIRS, SPORTING EVENTS & <u>CELEBRATORY FUNCTIONS.</u>

a) Layout Planning and Means of Escape

- 1. The maximum size of a single tent shall not exceed 2,000 square m.
- 2. Tents shall be separated from the building facades and from other tents by at least a distance equal to the highest point of the tent.
- 3. Enclosed tents shall be of material having a minimum surface flame spread class 2 rating (to be supported by certification).
- 4. Tents acting as a sheltered link from buildings to tents or from tents to tents shall not be more than 6m wide and 3m high. These tents shall not be enclosed. They shall be spaced at least 36m apart.
- 5. A minimum of 2 exits shall be provided and each exit shall be of minimum 2m width irrespective of occupant load. The exit capacity is based on a maximum of 120 persons per meter width of exit.
- 6. The maximum travel distance from any point within the tent to the nearest exit at the external edge of the tent shall not exceed 30m.
- 7. The occupant load shall be based on a minimum of 1.5 square m per person.
- 8. Seats if are provided, they shall be in accordance to plans submitted for approval. Maximum number of seats in a row shall not exceed 12 and a minimum aisle width of 1.5m shall be provided. Seats shall be secured properly to the floor.
- 9. To submit a plan (prepared and endorsed by a qualified person) of the tent layout with calculations of designed occupant load, travel distance and exit capacity.
- 10. Any row of stall inside a tent shall not exceed 15m in length.
- 11. Separation distance of at least 3m between rows of stalls shall be maintained.
- 12. Tents and event areas are to be provided with sufficient numbers of self-contained emergency lighting.
- 13. All designated exits points shall be provided with illuminated "Exit" signs incorporated with battery operated standby power supply.
- 14. All escape routes / passageways shall be free of obstruction. Exit points shall lead directly to open exterior areas.

b) Fire Fighting Provisions and Structural Fire Precautions

- 1. All parts of a tent are to be located within 100m of a fire hydrant. And no tent shall be located within 3m of any fire hydrant, breeching inlets of fire fighting rising mains or fire exit staircases of neighboring buildings.(This requirement may be waived by EHS-Fire Dept for the sites where fire hydrants are not available).
- 2. No activity shall be carried out on the fire engine access way / fire engine hard standing (parking space) or pedestrian walkways.
- 3. ABC dry chemical powder fire extinguisher (approved type) of 2.5 kg capacity shall be provided such that no person needs to travel more than 15m to reach them.

- 4. Two 2.5kg capacity carbon dioxide fire extinguishers (approved type) shall be provided in the vicinity of each generator / air conditioning set. Generators are to be sited at least 5m away from buildings and tents / stalls.
- 5. AC units with return-air shall be fitted with smoke detectors.
- 6. Roofing or false ceiling of covered booths shall be of non-combustible material or minimum class 2 surface flame spread rating (to be supported by certification.)
- 7. The erection of multi-storey structures is prohibited.
- 8. All sides of the timber flooring decking / stage / platform shall be properly sealed with no storage of goods / materials / electrical services beneath them.
- 9. Fabric materials / curtains for stage shall be of minimum class 2 surface flame spread rating (to be supported by certification).
- 10. Fire Vehicle(s) & ambulance(s) shall be kept standby at the site throughout the event.

c. Other Fire Safety Precautions

- 1. Any activity involving the use LPG and flammable liquids / gases is prohibited.
- 2. "Open-flame" cooking is not allowed except where solid fuel burners are used to warm food that has already been prepared and cooked.
- 3. Combustible materials are kept to a minimum and away from heat sources.
- 4. Electrical fixtures /wiring are firmly secured away from public's path.
- 5. The event organizer shall provide a team of personnel for emergency evacuation and for fighting incipient fires on site.
- 6. Civil or structural engineer's certification is required wherever structural safety is involved.
- 7. To contact EHS-Fire Dept at 8835999 to arrange for an inspection of the site 2 days before the commencement of the event.
- 8. To remove / clear the temporary structures within 3 days upon expiry of the approved period. The duration of the event is limited to at most 2 months.

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<u>APPENDIX – 8</u>

FIRE TRAINING REQUIREMENTS

SR. NO.	OCCUPANCY CHARACTERISTICS	TOTAL NO. OF EMPLOYEES TO BE TRAINED IN FIRST AID FIRE FIGHTING	TOTAL NUMBER OF EMPLOYEES TO BE TRAINED IN FIRE HOSES, FIXED INSTALLATIONS, FIRE ALARM SYSTEMS, AND AUTOMATIC FIRE SUPPRESION SYSTEMS. ETC.
1.	OFFICES, ASSEMBLY, COMMERCIAL, RESIDENTIAL, SHOPS.	5%	5%
2.	INDUSTRIES (2.1) HIGH RISK (2.2) MEDIUM RISK (2.3) LOW RISK	ALL 10% 5%	ALL 10% 5%
3.	STORAGE (3.1) HIGH FUEL RISK (3.2) MEDIUM FUEL RISK (3.3) LOW FUEL RISK	ALL 10% 5%	ALL 10% 5%

List of approved training facility / institutions

SI. No	Name	Contact Details
1	PCFC Training Facility at West Fire Station Near R/A 11.	Tel: 04 - 8835999
		Fax: 04 - 8839171
2	Dubai Civil Defence Training Center, Al Aweer, Dubai.	Tel: 04- 2870666
		Fax: 04 – 2871210
3	Gulf Technical & Safety Training Center, Abu Dhabi.	El: 02 – 5541220
		Fax: 02 – 5541716

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<u>APPENDIX – 9</u>

AVOIDANCE OF FALSE ALARMS FROM AUTOMATIC SMOKE DETECTORS

SI.No	CAUSE	PREVENTIVE/CORRECTIVE MEASURES
1	Accumulation of dust inside the detector	 Monthly cleaning of detectors. Sensitivity adjustment depending on the ambient dust level in the protected area
2	Smoking	To avoid smoking in the area protected by smoke detectors.
3	Artificial simulation of "smoke condition" by dust (getting kicked up) due to clean up activities viz. sweeping, blowing etc.	Prior intimation to PCFC Emergency Control Centre (Tel: 8833222) before commencing clean-up activities.
4	Smoke generated by welding & cutting processes	 Detectors to be disabled/isolated temporarily (short term measure).
		 Detectors to be disabled/isolated temporarily through zone isolation panel(s) (to be installed as long term measure) Prior intimation to PCEC Emergency Control Control
		(Tel: 8833222)
5	Ingress of insects into detectors	Treatment of the protected areas with insecticides at regular intervals.
6	Repairs to or periodical checking of fire alarm panels, circuits & loops etc.	Prior intimation to PCFC Emergency Control Centre (Tel: 8833222).
7	Earth fault	To be rectified
8	Loop fault	To be rectified
9	Faulty detector	Detector to be replaced
10	Faulty panel	To be rectified
11	Faulty selection of detector	Replacement by appropriate type of detector