



DUBAI AVIATION CITY CORPORATION OHSE CODE OF PRACTICES



DATE: 28.10.2019

DACC CODE OF PRACTICE – SAFEGUARDING OF
DANGEROUS MACHINERY



SAFEGUARDING OF DANGEROUS MACHINERY

DACC (DUBAI SOUTH) Code of Practice

Document Reference No.: DACC.DS.OPS.OHSE.OST.06.DM

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1.0 INTRODUCTION

- (i) This Code of Practice (CoP) is mandatory to all Operational Facilities within the Dubai South jurisdiction. This CoP is designed to incorporate requirements set by UAE and other relevant Regulatory authorities. If requirements of this document conflict with requirements set by another regulatory authority, Duty Holder are required to follow the more stringent requirement.
- (ii) Operational facilities means the business units such as Factories, Logistics and Warehouse Facilities, Recreational Facilities, Multi Store Apartments, Retail Facilities, Offices, Educational Institutions, Medical Facilities, etc. and all other facilities which are registered under Dubai South Licensing and Registration Department and operating in Dubai South Jurisdiction.
- (iii) A duty Holder is defined as;
 - a) The person(s) who owns or is in control, through contract or tenancy, of non-domestic premises;
 - b) With regard to multiple tenanted premises, the duty holder shall be the person who owns or is in control of the building, including access and egress
 - c) All other persons shall cooperate with the with the duty holder to allow them to comply with their duties requirements under this CoP.
- (iv) This CoP establishes the requirements and standards so that the risk associated with the safeguarding of machinery are assessed, that control measures are implemented in accordance with the hierarchy of controls and those control measures are implemented to prevent injury, illness and disease to persons who might be exposed to risks arising from the operation of dangerous machinery.
- (v) "Machinery" means an assembly or linked part of components, at least one of which moves with appropriate actuators, control and power circuits joined together for a specific application in processing, treatment, moving or packaging of materials. This includes an assembly of machines, which in order to achieve the same end, are engaged and controlled so that they function as an integral unit.
- (vi) "Guard" means a physical barrier that prevents or reduces access to a danger point or area.
- (vii) "Interlock" means a device including presence-sensing devices that connects a guard or machine element with the control system or the power system of the machinery which will eliminates or reduces danger.
- (viii) Whilst transporting/installing/operating/decommissioning of any machinery; Duty Holder shall comply with the basic principles of machinery safety as follows;
 - a) Identification of all hazards;
 - b) Assessment of the risks;
 - c) Elimination or minimization of hazards by design features;
 - d) Elimination or minimization of risk by design features;



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- e) Use of safeguards;
 - f) Use of administrative controls e.g.- Safe working practices
- (ix) Duty Holder shall ensure that machinery's have "Declaration of Conformity" and Complied with other relevant international standards e.g. – CE, CSA, UL.
- (x) Where existing machinery has been designed / installed without taking hazards into consideration, Duty Holder shall take every attempt to identify and eliminate those hazards.

2.0 TRAINING AND AWARENESS

- (i) Duty holder shall ensure that OHSSE training complies with the requirements of:
 - a) *Dubai Aviation City Corporation (DACC) OHSERF - Regulations 6 – Competence Management, Training and Awareness;*
- (ii) Supervisors and machinery operators shall be instructed and trained in at least the following;
 - a) Machinery safety procedure, including emergency procedures.
 - b) The correct and safe way of operating machinery, including the freeing of jammed material and the correction of machine malfunctions.
 - c) Knowledge and understanding of the hazards they face at the workplace.
 - d) Understanding the purpose and function of the safeguards.
 - e) Reporting faults immediately, including guard defects.
 - f) Selection, use and care of protective clothing and equipment relevant to the workplace.
 - g) Need for housekeeping.
 - h) Statutory requirements.
- (iii) Plant engineers and maintenance staff shall be trained in at least the following;
 - a) Principles of safeguarding machinery.
 - b) Electrical and mechanical safety.
 - c) Precautions during maintenance work, including safe systems of work and, where necessary, permit to work and lock-off systems, e.g. padlock, captive-key or interlock key exchange and emergency procedures.
 - d) Wearing and care of protective clothing and equipment.
 - e) Maintaining any specialized equipment under their control.

3.0 REQUIREMENTS

- (i) Duty Holder shall undertake their roles and responsibilities in accordance with the general requirements of *Dubai Aviation City Corporation (DACC) OHSERF – Regulation 5 – Leadership, Roles, Responsibility and Self-Regulation.*



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- (ii) Duty Holder shall conduct full ergonomic study prior to the operation of Machinery and must ensure control measures are taken by considering factors such as Anthropometry, human performance, human error, working environment and person- Machine interface.
- (iii) Duty Holder shall take control measures to prevent the Mechanical and Non-Mechanical Hazards related to Machinery;

Mechanical Hazards such as:	Non- Mechanical Hazards such as:
Entanglement	Slip, trip and fall
Friction and abrasion	Handling and lifting
Shear	Electricity
Stabbing and puncture	Chemicals
Impact	Fire and Explosion
Crushing	Noise and Vibration
Drawing in	Pressure and vacuum
Compressed air or high pressure fluid injection	Extremes of temperature, inhalation and suffocation
Material ejected from machine	Ionizing and Non-ionizing radiation
Release of potential energy	Biological

- (iv) Control devices such as start, stop, handle, handle wheels, levers, clutches etc. for the machinery should be placed where the operator can reach them easily without stretching or moving from a normal working position.
- (v) Duty Holder must augment an interlocking device with a mechanical restraint device.
- (vi) Machinery which cannot be moved or transported manually should be equipped with, or be capable of being with, suitable devices for transport by means of durable lifting attachments. Weight details should be displayed on the machine.
- (vii) Machines shall be designed to be stable, as not capable of being unintentionally moved by vibration, wind pressure or other foreseeable external sources.
- (viii) Whilst installing hydraulic and pneumatic systems, all methods of failure including control supply failure shall be considered and must take reasonably practicable control measures.
- (ix) When a hazard or risk cannot be eliminated or avoided by design, the provisions of safeguards shall be considered, Duty Holder must consider four critical factors to be considered in the selection process are;
 - a) The severity of potential injury;
 - b) The frequency of access or entry to the danger zone and/ or the time of exposure to the hazard;



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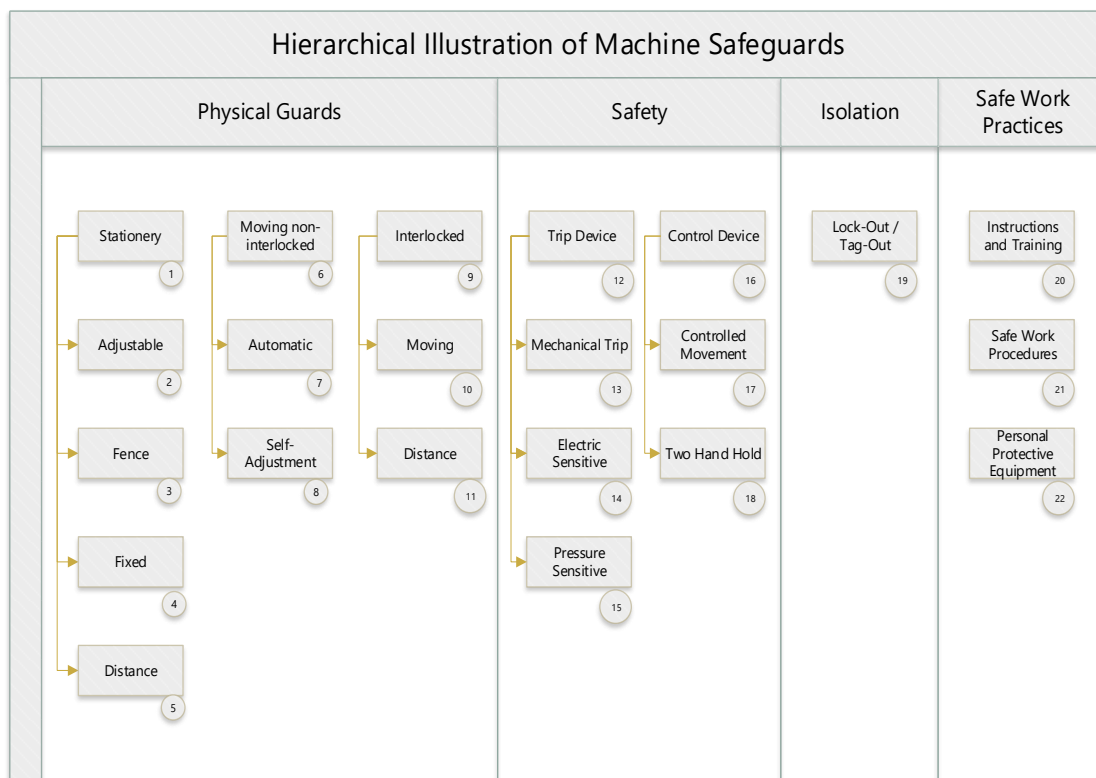
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- c) The possibility of avoiding the hazard; and
- d) The type process and operating requirements.
- (x) Duty Holder shall provide appropriate safeguards to eliminate the hazards, a hierarchical illustration of machine safeguards is shown in below figure (3.1). The use of various administrative controls is always an essential complimentary element and should be developed in conjunction with selection of safeguards; e.g. training will be common to all safeguarding systems and the safe use of machinery.

Figure – 3.1

Hierarchical Illustration of Machine Safeguards



3.1 Definitions

(1) **Stationery Guards** – A stationery Guard is a physical barrier which has no moving parts and offers protection only whilst guard is in its correct position.

(2) **Adjustable Guard** – An adjustable guard is stationary guard which is adjustable as a whole or which incorporates an adjustable part or parts. The adjustment remains fixed during a particular operation and adjustment should only be carried out when dangerous movements have completely stopped.

(3) **Fence Guard** – A fence guard is a stationery guard which completely safeguards a machine. A fence guards are often fitted with an interlocked gate or interlocked to the machine controls.



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(4) **Fixed Guard** – A fixed guard is a stationery guard which prevents access to the dangerous part of machinery by enclosure or by providing a rigid barrier.

(5) **Distance Guard** – A distance guard is a stationery guard which does not completely enclose a hazard but which reduces access to the danger point by virtue of its physical dimensions and its distance from the hazard.

(6) **Moving Non-Interlocked** – A moving non-interlock guard is a physical barrier which moves or has moving parts. The guard is mechanically connected to the machine in such a way that as the machine moves or as the work piece moves, the guard also moves and takes up a safe position.

(7) **Automatic Guard** – An automatic guard/Push Away Guard is a guard which is moved into position automatically by the machine, thereby protecting person from the danger area. This guard may be used only where the speed of the guard movement does not introduce any further danger.

(8) **Self- Adjustment Guard** – A self-Adjusting guard is a movable guard which, either wholly or in part, adjusts itself to accommodate the passage of material. This type of protection is designed to prevent access to any dangerous parts until actuated by the movement of the work piece.

(9) **Interlocking Guard** – An Interlocking Guard is a physical barrier which is interconnected with the power or control system of the machine.

(10) **Moving Interlocking Guard** – A Moving Interlocking Guard is a guard which has a movable part and whose movement is interconnected with the power or control system of the machine.

(11) **Interlocking Distance Guard** – An Interlocking Distance Guard is an interlocking guard which does not completely enclose a hazard but which prevents access by virtue of its physical dimensions and its distance from the hazards.

(12) **Trip Device** – A trip device is a device that causes working machinery to stop or undertake a safe condition and prevents injury when a person approaches beyond safe limit.

(13) **Mechanical Trip Device** – The essential element of a mechanical Trip Device is a barrier or part of a barrier, e.g. Trip Edge, which is moved by part of the body as a danger area is approached. This movement of the device operates controls which may be electrical, mechanical, hydraulic or pneumatic.

(14) **Electro-Sensitive Safety Systems** – Electro-sensitive Safety Systems operate either as trip devices on the principle of detecting the approach of persons or objects to dangerous parts, or presence sensing device where, so long as a person or object is detected, the dangerous parts cannot be set in motion.

(15) **Pressure Sensitive Safety Systems** – A pressure-Sensitive system contains sensors which operate when a person or object applies pressure to the device.



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(16) Control Device – A Control Device is a safety device which prevents injury by influencing the machine function, minimizing or preventing inadvertent operations or by positioning the controls relative to the danger area.

(17) Controlled Movement – Controlled Movement devices prevent injury to a person by designing the control so that the function of the machine is controlled.

(18) Two-Hand Control Device – A Two-Hand Control Device is a device which requires actuation by both hands in order to initiate and maintain any operation of the machinery, where guarding is impracticable, two-hand control devices offer a means of protecting the hands of the machine operator.

(19) Isolation – Disconnecting or separating the machine or defined part of the machine from all power supplies.

(20) to (22) shall be applicable to all the Safeguards.

(20) Instructions and Training – Supervisors and Machinery operators should be formally trained in the knowledge and application of safe work procedures and practices related to Machinery and Safeguarding.

(21) Safe Work Procedures – A Safe work procedures covers Inspections and audits, Safe Handling of Machinery, Safe Operating of Machinery.

(22) Personal Protective Equipment – Personal Protective Equipment is to minimize the risk of injury by using Special clothing, Safety head and Foot wear, gloves, hearing protection and eye protection or breathing apparatus which will be applicable as per the outcome of Risk Assessment.

- (i) Whilst selecting guards, Duty Holder must ensure that;
 - a) Guard shall not itself present a hazard such as trapping or shear points, rough or sharp edges likely to cause injury;
 - b) Ability to withstand the force of ejection of part of the machinery or material being processed, where this a foreseeable danger;
 - c) Weight and size in relation to the need for removal and replacement for routine maintenance;
 - d) Compatibility with the material being processed, where the guard material should not constitute a source of contamination of the product (Mainly applicable for Food and pharmaceutical industries)
 - e) Ability to maintain its physical and mechanical properties after coming into contact with potential contaminants such as cutting fluids used in machine operation or cleaning and sterilizing agents; and
 - f) Potential to trap atmospheric contaminants and other materials within the guarded area so that the area within the guard can become a confined space.
- (ii) Duty Holder must ensure that functions of an interlock and the guard with which it operates shall be designed, installed and adjusted so that;
 - a) Until the guard is closed the interlock prevents the machinery from operating by interrupting the power medium; and



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- b) Either the guard remains locked closed until the risk of injury from the hazard has passed, or opening the guard causes the hazard to be eliminated before access is possible.
 - (iii) Machinery shall be installed and commissioned in accordance with the design specifications and as per manufactures manual, where a deviation appears necessary, approval by the designer should be sought and approval records shall be available.
 - (iv) Duty Holder must ensure that all required inspection and maintenance procedures should be carried out in manner and at the frequency indicated in the manufacturer's instructions with inspection/ maintenance records and it shall be carried out by competent personnel. Where instructions and manuals are not supplied, specialized bodies advice should be sought and those bodies must be approved by Dubai South OHSSE and specialized department from Dubai Municipality.
 - (v) Duty Holder must ensure that employees follow safe-work practices such as good housekeeping, prevent entanglement by avoiding loose clothing, necklace, rings and other jewelry, long hair (unless tied back or covered) or any other material likely to be caught up should be avoided, kickback precautions, bursting precautions, use of appropriate Personal protective equipment etc.
 - (vi) Duty Holder shall comply with isolation and energy dissipation procedures during all types and conditions of entry to danger zones during maintenance operations.
 - (vii) Whilst installing safety measures for controlling mechanical hazards, Duty Holder should give consideration to noise reduction, as guard panels should not augment machinery noise levels because of poor installation.
 - (viii) Duty Holder must ensure adequate lighting during the operation and maintenance of machinery and following aspects must be considered;
 - a) Average illuminance of 100 lux;
 - b) The direction and intensity of lighting;
 - c) The contrast between background and local illumination;
 - d) The color of the light source;
 - e) Reflection, glare and shadows;
 - f) The stroboscopic effect from moving machinery.
 - (ix) Duty Holder should adopt a bold, recognizable, consistent pattern or symbol using standardized colors and should comply with OSHA 1910.144, OSHA 2013 Safety signs and standards.
 - (x) Electrical control devices and electrical wiring of machinery must be comply with NFPA 70, NFPA 70B and NFPA 70E and attention should be paid to the resistance of the devices to the environmental conditions under which they must operate including-
 - a) Life evaluation and reliability;
 - b) The index of protection(IP) offered;
 - c) Corrosion resistance;
 - d) Vibration resistance; and
 - e) Resistance to electromagnetic interference.



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- (xi) Duty Holder must take reasonably practical measures to prevent the oil spillage and in the event of automatic lubrication system failure, means may be required to stop the machine as soon as practicable.

4.0 RECORD KEEPING

- (i) Employee medical surveillance and medical records shall be maintained in accordance with Dubai aviation City Corporation (DACC) Code of Practice - Occupational Health Screening and Medical Surveillance.
- (ii) All maintenance, inspection and testing records shall be maintained in accordance with Dubai South Code of Practice – Inspection, Testing and Tagging.
- (iii) Employee training records shall be maintained in accordance with Dubai aviation City Corporation (DACC) OHSERF - Regulation 14 – Performance Management and Dubai aviation City Corporation (DACC) OHSERF – Regulation 19 – Management Review.
- (iv) Manufactures Manual shall be available.
- (v) Inspection and maintenance reports shall be available.
- (vi) Training records of the operatives shall be available.

5.0 REFERENCES

NO.	DOCUMENT NAME	DOCUMENT NO.
1	Risk Management	DACC.DS-OHSERF – Regulation 2
2	Leadership, Roles, Responsibility and Self-Regulation	DACC.DS-OHSERF – Regulation 5
3	Competence Management, Training and Awareness	DACC.DS-OHSERF – Regulation 6
4	Communication, Consultation and Participation	DACC.DS-OHSERF – Regulation 7
5	Document Control and Record Management	DACC.DS-OHSERF – Regulation 8
7	Emergency Management	DACC.DS-OHSERF – Regulation 13
9	Incident Management	DACC.DS-OHSERF – Regulation 15
10	Management Review	DACC.DS-OHSERF – Regulation 19
10	General Workplace Amenities	DACC.DS.OPS.OHSE.WRW.01.WA
11	Waste Management	DACC. DS.OPS.OHSE.ENV.03.WM
12	Labor Law and its Amendments	Federal Law No. (8) of 1980
13	Determination of Preventive Methods and Measures for the Protection of Workers from the Risks of Work	Ministerial Order No. (32), of 1982
14	Permit to work systems	DACC. DS.OPS.OHSE.OST.09.WS
15	Personal Protective Equipment	DACC. DS.OPS.OHSE.OST.10.PP
17	Safeguarding of Machinery	AS 4024.1-1996
18	Guidelines for Guarding of Dangerous Machinery	DM PH & SD-P4-TG 06
21	Dubai aviation City Corporation (DACC) OHSE Regulatory Framework	2018