EHS Manual

(Bajaj Finserv Group)

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CHAPTER 1 – INTRODUCTION

1.1 PURPOSE:

a) Purpose of this EHS Manual is to document various Environment, Health and Safety programs and procedures established for compliance at Bajaj Finserv Group Sites ((BFS or Bajaj Finserv)- which means and includes all Premises and sites (hereinafter referred to as a "site"), owned and/or operated by all companies that are subsidiaries and associates of Bajaj Finserv Limited) and provide guidelines for maintaining healthy and safe working conditions and to promote safe practices by all on-site staff.

b) The requirements specified in this EHS Manual are aimed at achieving Bajaj Finserv's commitment towards Environment, Health and Safety Policy and the objectives by preventing non-conformity at all stages and is to be used for guidance by all on-site staff deployed at sites. To demonstrate its commitment to Environment Health and Safety, Bajaj Finserv has an established EHS policy. The subsequent chapters describe the EHS requirements specific to Facility / Property management sites to implement EHS guidelines and standards.

c) The EHS process is designed to cover environmental aspects and health and safety risks that the facility/property can control and directly manage, and those that it does not directly control or manage but over which it can be expected to have an influence.

d) The following conditions apply to this EHS Process Manual:

i. This EHS Manual has been prepared for the sole purpose of our on-site employees relative to applicable Environment, Health & Safety Regulations. It may be used exclusively for that purpose and for no other purpose at all.

ii. It is not intended to constitute any type of contract, expressed or implied, with any person or entity.

iii. BFS reserves its legal right to challenge any unauthorized disclosure of information contained in this manual, and to have this document and its contents treated as trade secret information. The unauthorized disclosure of this information is strictly prohibited.

1.2 ROLE & RESPONSIBILITIES:

A) BFS EHS REPRESENTATIVE/SPOC:
Each Company that is a part of the Bajaj Finserv group shall appoint a SPOC, who shall be charged with the following responsibilities as regards their company is concerned besides any group EHS governance role

i. To have overall responsibility for implementing the Environment, Health and Safety Guidelines and to ensure that any revisions are brought to the attention of all employees/staff.
ii. To designate members of the management team to be responsible for supervising the implementation of EHS Manual/SOP and regularly reviewing its implementation.
iii. Periodic review of the Manual and related SOPs, as appropriate.
iv. To arrange EHS specific training/briefing sessions to Vendor employees deployed at Sites, to enable them to fulfill their duties in accordance with these Guidelines.
v. To ensure disciplinary procedures exist, covering refusal to comply with, or breaches of the environment, health and safety regulations (whether in-house or statutory) and are followed by the appropriate departments.
vi. To ensure that appropriate procedures are in place whereby partners and employees are consulted on matters affecting environment, health and safety at work.
vii. To set a personal example in all aspects of health and safety.

B) PROPERTY MANAGERS & SITE LEADS: The Facility/Property Managers or Site Leads are responsible for following, as far as reasonably practicable in conjunction with BFS representatives:

i. Relevant requirements of health, safety and fire legislation are complied with in accordance with guidelines in this EHS Manual.

ii. Bajaj Finserv Group sites are laid out and maintained to ensure, so far as is reasonably practicable, the health and safety of employees, visitors and Vendor's staff.
iii. Adequate health and safety training is given to their existing on-site staff and at the time of induction to all new employees, including Vendor staff.
iv. Adequate first aid facilities and sufficient number of appropriately trained first aiders are available, and to ensure that employees are notified of such arrangements.
v. All accidents are correctly reported in accordance with these Guidelines.
vi. All employees required to use work equipment are adequately supervised, trained and informed as to its proper use; and that restrictions are placed on those tasks that are likely to involve specific health and safety risks, and that employees are not permitted to carry out repairs unless authorized.
vii. Chemical management guidelines are implemented at site with records of MSDS at one place, training to down the line staff for use of chemicals and handling spills, maintaining chemical inventory.
viii. Ensuring the co-operation and co-ordination of all contractors working within premises. Issuing them with relevant extracts of site specific EHS Manual and obtaining from each contractor a copy of its Employer's Liability Insurance certificate and health and safety policy, and where appropriate a copy of their risk assessment and method statement for the work.
ix. All equipment purchased should meet approved safety standards and is suitable for its purpose. Adequate instructions and arrangements are in place for it to be inspected and maintained as recommended by the manufacturer.
x. The elevators should be thoroughly examined through facility Manager at appropriate intervals and copies of inspection/ examination reports needs to be held in an accessible location, e.g. FM Office or lift motor room. The elevators need to be maintained in an efficient state between statutory inspections by a competent inspection company and that service records are also kept in the same location.
xi. All electrical distribution systems in the premises, together with electrical equipment including portable equipment are regularly inspected and maintained.
xii. For premises with air conditioning/ventilation systems where there is the possibility of exposure of cooling water to the general atmosphere ensure that arrangements are made to prevent the growth of microorganisms, e.g. by water treatment or regular cleaning of such systems and to keep up-to-date records of such treatment and cleaning.
xiii. Conducting Energy Audit and identify conservation points and preparing an action plan to achieve annual targets.
xiv. All other plant and machinery is properly inspected, maintained and regularly serviced and keep up-to-date records of this work.
xv. To set a personal example in all aspects of environment, health and safety.

- Because this EHS Manual is designed to be universal, it may be necessary to issue special instructions to cover site specific conditions or unusual circumstances. Careful instruction and indoctrination of all personnel is necessary to ensure effective compliance with this manual.
- To effectively use the EHS Manual and program, subcontract management must assume responsibility for their compliance with all applicable Central, State and Local regulations.
- BFS is committed that accident prevention is an essential and vital part of the workplace. Every employee must consider safety as a fundamental part of their job. As we make safety the first order of business, we will find that accidents are not inevitable; they can be controlled and prevented.

CHAPTER 2 – ELECTRICAL SAFETY

3.1. INTRODUCTION: These procedures are designed to provide guidance to on-site employees at BFS Group IFM and Asset Management sites working on or near exposed de-energized parts. It is the responsibility of the supervisor and employee to follow these requirements. Changes to lockout/ tag-out procedures must be made in writing**.**

3.2. GENERAL: When work is performed near or on equipment or circuits which are, or may be energized, safety-related work practices shall be employed. These practices are designed to prevent electric shock or other injuries relating from either direct or indirect electrical contact. Specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

3.3. DE-ENERGIZED PARTS: Live parts to which an employee may be exposed shall be de-energized before the employee works on or near them, unless de-energizing introduces additional or increased hazards, or it is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Note: Examples of work that may be performed on or near energized circuit parts due to equipment design or operational limitations include testing of electric circuits that can only be performed with the circuit energized, and work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment

3.4. ENERGIZED PARTS:

a) If the exposed live parts are not de-energized for reasons of increased or additional hazards, other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved.

b) Such work practices shall protect employees from contact with energized circuit parts directly with any part of their body, or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed conductors or circuit parts.

c) This section applies to work on exposed de-energized parts or near enough to them to expose the employee to any electrical hazard. Conductors and parts of electric equipment that have been de-energized but have not been locked or tagged out in accordance with requirements set forth below, shall be treated as energized parts.

3.5. LOCKOUT/ TAGOUT: When any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out or tagged out or both, in accordance with the requirements of this section. The requirements shall be followed in the order they are presented.

Note: As used in this section, fixed equipment refers to equipment fastened in place or connected by permanent wiring methods.

A) DE-ENERGIZING EQUIPMENT:

i. Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment is de-energized.

ii. The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches and interlocks, may not be used as the

sole means for de-energizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for Lockout/ Tag out procedures.

iii. Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged, and high capacitance elements shall be short-circuited and grounded if the stored electric energy might endanger personnel.

iv. Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved to the extent that the circuit parts cannot be accidentally energized by the device.

B) APPLICATION OF LOCKS AND TAGS:

i. A lock and tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed. The lock shall be attached to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

ii. Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

iii. If a lock cannot be applied, or if it can be demonstrated that tag-out procedures will provide a level of safety equivalent to that obtained using a lock, a tag may be used without a lock.

iv. A tag used without a lock shall be supplemented by at least one additional safety equivalent to that obtained using a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

v. A lock may be placed without a tag only under the following conditions:

- ✓ Only one circuit or piece of equipment is de-energized.
- ✓ The lockout period does not extend beyond the work shift.
- ✓ Employees exposed to the hazards employed with re-energizing the circuit or equipment is familiar with this procedure.

3.6. VERIFICATION OF DE-ENERGIZED CONDITION:

a) The requirements of this clause shall be met before any circuits or equipment can be considered and worked as de-energized.

b) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

c) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists because of inadvertently induced voltage or unrelated voltage back feed even though specific parts of the circuit have been de-energized and presumed to be safe.

d) If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

3.7. RE-ENERGIZING EQUIPMENT:

a) These requirements shall be met, in the order given, before circuits or equipment is re-energized, even temporarily.

b) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed so that the circuits and equipment can be safely energized.

c) Employees exposed to the hazards employed with re-energizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

d) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task if:

i. The supervisor ensures that the employee who applied the lock or tag is not available at the workplace.
ii. The supervisor ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

Note: There shall be a visual determination that all employees are clear of the circuits and equipment.

3.8. USE OF FLAMMABLE OR IGNITABLE MATERIAL: Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to:

a) Flammable gases, vapours, or liquids
b) Combustible dust
c) Ignitable fibres or filings

MINIMUM DISTANCE TO BE MAINTAINED AWAY FROM THE FLAMMABLE MATERIAL	
VOLTAGE RANGE (PHASE TO PHASE)	**APPROACH DISTANCE** (MINIMUM)
300 V and less	Avoid contact
300 V to 750 V	1 foot (30.5 cm)
750 V to 2 kV	1.5 feet (46 cm)
2 kV to 15 kV	2 feet (61 cm)
15 kV to 37 kV	3 feet (91 cm)
37 kV to 87.5 kV	3.5 feet (107 cm)
87.5 kV to 121 kV	4 feet (122 cm)
121 kV to 140 kV	4.5 feet (137 cm)

3.9. WORK ON EXPOSED ENERGIZED PARTS: This section applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

A) WORK ON ENERGIZED EQUIPMENT: Only qualified persons may work on electric circuit parts or equipment that has not been de-energized under the procedures of this section. Such persons shall work safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

B) OVERHEAD LINES: If the work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. If lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

C) UNQUALIFIED PERSONS: When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line that the following distances and voltages to ground:

i. 50 kV or below: 10 feet (305cm)
ii. Over 50kV: 10 feet (305cm) plus 4 inches (10cm) for every 10 kV over 50 kV.

Note: When an unqualified person is working on the ground near overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given above.

D) QUALIFIED PERSONS: When a qualified person is working near overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table at section 3.8 above, unless:

i. The person is insulated from the energized part possibly with gloves and sleeves rated for the voltage involved.
ii. The energized part is insulated both from all other conductive objects at a different potential and from the person.
iii. The person is insulated from all conductive objects at a potential different from that of the energized part.

E) VEHICULAR AND MECHANICAL EQUIPMENT: Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized lines shall be operated so that a clearance of 10 feet (305 cm) is maintained. If voltage is higher than 50 kV, the clearance shall be increased 4 inches (10 cm) for every 10 kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

i. If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50 kV, the clearance shall be increased 4 inches (10cm) for every 10 kV over that voltage.

ii. If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

iii. If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the un-insulated portion of the aerial lift and the power line) may be reduced to the distance given in above table.

iv. Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

- ✓ The employee is using protective equipment rated for the voltage.
- ✓ The equipment is located so that no un-insulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line permitted above.

v. If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistance and fault currents, which can develop within the first few feet or more outward from the grounding point.

F) ILLUMINATION:

i. Employees may not enter spaces containing exposed energized parts, unless illumination is provided, enabling the employees to perform the work safely.
ii. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts. Employees may not reach blindly into areas which may contain energized parts.

G) CONFINED OR ENCLOSED WORKSPACES:

i. When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employee shall use protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts.

ii. Doors, hinged panels and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

H) CONDUCTIVE MATERIALS AND EQUIPMENT: Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts.

I) PORTABLE LADDERS: Portable ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

J) CONDUCTIVE APPAREL: Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metallic aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered non-conductive by covering, wrapping or other insulating means.

K) HOUSEKEEPING DUTIES:

i. Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards, such as insulating equipment or barriers, are provided.
ii. Electrically conductive cleaning materials (including conductive solids such as steel wool, metallic cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

L) INTERLOCKS: Only a qualified person may unlock an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is complete.

M) PORTABLE ELECTRICAL EQUIPMENTS: This section applies to the use of cord and plug-connected equipment, including flexible cord sets (extension cords).

N) HANDLING: Portable equipment shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

O) VISUAL INSPECTIONS:

i. Portable cord and plug-connected equipment and flexible cord sets (extension cords) shall be visually inspected before use on any shift for external defects and for internal damage. Cord and plug-connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.
ii. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until necessary repairs and tests to render the equipment safe have been made.
iii. When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be checked to ensure that they are of proper mating configurations.

P) GROUNDING-TYPE EQUIPMENT:

i. A flexible cord used with grounding-type equipment shall contain an equipment grounding conductor.
ii. Attachment plugs, and receptacles may not be connected or altered in a manner which would prevent proper continuity of the equipment grounding conductor at the point where plugs re-attached to receptacles. Additionally, these devices may not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.
iii. Adapters which interrupt the continuity of the equipment grounding connection may not be used.

Q) CONDUCTIVE WORK LOCATIONS: Portable electric equipment and flexible cords used in highly conductive work locations, such as those inundated with water or other conductive liquids, or in job locations where employees are likely to contact water or conductive liquids, shall be approved for those locations.

R) CONNECTIVE ATTACHMENT PLUGS:

i. Employees' hands may not be wet when plugging and unplugging flexible cords and cord and plug-connected equipment if energized equipment is involved.

ii. Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employees' hand (if, for example, a cord connector is wet from being immersed in water). Locking-type connectors shall be properly secured after connection.

S) ELECTRIC POWER & LIGHTING CIRCUITS, ROUTINE OPENING & CLOSING OF CIRCUITS: Load-rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load-break type, fuses, terminal lugs, and cable splice connections may not be used for such purposes, except in an emergency.

T) RE-CLOSING CIRCUITS AFTER PROTECTIVE DEVICE OPERATION: After a circuit is de-energized by a circuit protective device, the circuit may not be manually re-energized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual re-closing of circuit breakers or re-energizing circuits through replaced fuses is prohibited.

U) OVER-CURRENT PROTECTION MODIFICATION: Over-current protection of circuits and conductors may not be modified even on a temporary basis beyond that allowed by the installation safety requirements for over-current protection.

V) TEST INSTRUMENTS AND EQUIPMENT: Only qualified persons may perform testing work on electric circuits or equipment.

W) VISUAL INSPECTIONS: Test instruments, equipment and all employed test leads, cables, power cords, probes and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until necessary repairs and tests to render the equipment safe have been made.

X) RATING OF EQUIPMENT: Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

CHAPTER 3 – HOT WORK PROCEDURES

4.1. INTRODUCTION: Hot Work includes welding, cutting, and brazing. As such, it is necessary to have a policy regarding hot work being conducted in any of the facilities/ properties. This Chapter includes the policies and procedures to be followed anytime hot work is carried out at BFS sites. It is the responsibility of the Building Manager/ Facility Manager/ Property Manager /Site Lead to ensure that all procedures are followed during hot work, including Checklist placed at Annexure-1. All contractors who do any hot work shall be made aware of these policies and will be required to complete the checklist for any hot work job.

4.2. FIRE PREVENTION: If the object of the hot work cannot be moved, all moveable fire hazards shall be taken to a safe place. If the object cannot be moved, and if all fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards. If the conditions listed above cannot be met, then hot work shall not be performed.

4.3. SPECIAL PRECAUTIONS: Whenever there are floor openings or cracks in the flooring that cannot be covered or closed, precautions must be taken so that combustible material on the floor below will not be exposed to sparks which may drop through the floor. These same precautions must be taken with regards to cracks or holes in walls, open doorways, and open or broken windows.

4.4. FIRE EXTINGUISHERS: Proper fire extinguishing equipment must be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, fire hose, or portable extinguisher. The equipment used must be of the same class as the combustible material (i.e., water for Class 'A' material, Carbon Dioxide for Class 'B' material, Dry Chemical for Class 'C' material, etc.) Fire Extinguishers used (new procurements) to be halon free () in order to minimize negative impact on the ozone layer

4.5. FIRE WATCH:

a) A fire watch is required whenever the possibility of anything other than a small fire may occur, or whenever one of the following conditions exists:

i. Appreciable combustible material is closer than 35 feet to the point of operation.
ii. Appreciable combustible materials are more than 35 feet from the point of operation but are easily ignited by sparks.
iii. Wall or floor openings are within a 35 feet radius which exposes combustible material in adjacent areas including concealed spaces inside walls or flooring.
iv. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs which are likely to be ignited by conduction or radiation.

b) Fire watchers must be trained in the proper use of fire extinguishing equipment and activating the alarm in case of a fire. Such equipment shall be readily available to the fire watchers.

c) Fire watchers shall watch for fires in all exposed areas. They shall try to extinguish fires only when it is obviously within the capacity of the equipment at hand. Otherwise they shall sound the alarm.

4.6. FLOORS: Combustible material such as paper clippings, wood shavings, or textile fibres shall be swept clean for a radius of at least 35 feet. Any combustible floors shall be kept wet, covered with damp sand, or protected by fire resistant shields. If the floor has been wet down, personnel operating arc welding or cutting equipment, must be protected from possible shock.

4.7. DUCTS: Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.

4.8. COMBUSTIBLE WALLS: Hot work done near walls, partitions, ceilings, or roofs of combustible construction must have fire resistant shields or guards to prevent ignition.

4.9. NON-COMBUSTIBLE WALLS: If hot work is to be done on metal walls, partitions, ceilings, or roofs, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation. It is preferred to move the combustibles. However, if combustibles cannot or are not moved, a fire watch on the opposite side from the work is mandatory.

4.10. PIPES: Hot work on pipes or other metals in contact with combustible walls, partitions, ceilings, or roofs shall not be conducted if the work is close enough to cause ignition by conduction.

4.11. PROTECTION OF PERSONNEL:

a) Welders or their helpers working on platforms, scaffolds, or runways shall be protected from falling by use of railings, safety belts, lifelines, or some other equally effective safeguards. Welding cable and other equipment shall be clear of passageways, ladders, and stairways.
b) Helmets or hand shields shall be used during all arc welding and arc cutting operations. All helpers or attendants shall be provided with proper eye protection.
c) Goggles or other suitable eye protection shall be used during all gas welding and oxygen cutting operations. Spectacles without side shields, with suitable filter lenses, are permitted for use for inspections.
d) All operators of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the job, to protect their faces or eyes as required.
e) Suitable eye protection goggles shall be used for brazing operations not covered above.

4.12. HOT WORK PROHIBITIONS: Hot work shall not be permitted in case of following;

a) In areas not authorized by management.
b) In buildings when the sprinkler system is impaired.
c) In the presence of explosive atmospheres (mixtures of flammable gases, vapours, liquids, or dust), or where such conditions may develop inside un-cleaned or improperly prepared tanks or equipment which previously contained such materials, or in areas which an accumulation of combustible dusts.
d) In areas near the storage of large quantities of exposed readily ignitable materials such as baled paper or cotton.
e) Check List for Hot Work placed at Annexure-1 and Work Permits placed at Annexure 5 to 8 to this Manual for Contractors are also relevant in this context.

CHAPTER 4 – FIRE SAFETY PROCEDURES

5.1. INTRODUCTION: An emergency plan for firefighting and evacuation must be made and should be available with the Asset Management sites on-site team always. Electrical wiring equipment for heating, light or power purposes must be installed in compliance with the statutory requirements. Internal combustion engine-powered equipment must be located with exhausts well away from combustible materials. Smoking is to be prohibited near to fire hazards, and such areas must be conspicuously posted. Care shall be taken properly to ground nozzles, hoses.

5.2. FACILITY/ PROPERTY FIRE CHECK LIST: Key highlights of Fire checklist are briefly indicated below:

a) Are safe ashtrays provided where smoking is permitted?
b) Are the fire extinguishers installed?
c) Are Heaters/ Motors/ Pumps properly guarded?
d) Are wet clothes kept clear of heaters?
e) Are portable heaters secure from being knocked over?
f) Is all temporary wiring well supported and protected?
g) Are any circuits overloaded?
h) Are all flammable liquids, gas cylinders and flammable materials separately and properly stored?
i) Are all gas appliances fitted with control taps?
j) No burning of rubbish is permitted outside
k) Is all flame cutting and welding taking place with proper precautions?
l) Are all blow lamps and blow torches being used correctly and all the hoses protected?
m) Do all night watchmen and security patrols know the fire routines?

5.3. PREVENTING THE SPREAD OF FIRE:

a) Is waste accumulating in hoist shafts, under buts, in odd corners?
b) Are separate metal waste containers supplied for each of the following: oily rags, paint rags, paint scrapings, waste flammable liquids, wood shavings and off-cuts?
c) Is all waste regularly cleared?

5.4. MEANS OF ESCAPE:

a) Are all gangways, stair and platforms free from obstruction?
b) Does everyone know what to do in an emergency?
c) Is fire drill practiced, and is there a system to verify that all have evacuated the area?

5.5. FIRE FIGHTING:

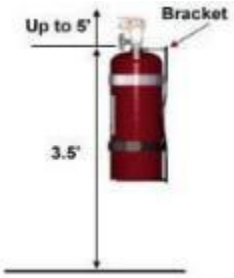
a) Have all extinguishers been checked and / or recharged?
b) Are they clearly identified and easily accessible?
c) Are operatives trained in their use?

Note: To avoid putting workers in danger, fire extinguishers should be located throughout the workplace and readily accessible in the event of a fire. These should be placed in hallways, laundry rooms, meeting rooms, kitchens, mechanical/ electrical rooms and near exit doors.

5.6. SELECTION AND PLACEMENT OF FIRE EXTINGUISHERS: For correct & timely use portable fire extinguishers, they must be selected and positioned based on the potential type and size of fire that can occur. Fire Extinguishers used (new procurements) to be halon free in order to minimize negative impact on the ozone layer The following guidelines will help to identify the number and types of portable fire extinguishers to be positioned at Asset Management sites:

<table>
<tr><td>TYPE OF FIRE</td><td colspan="3">SIZE AND SPACING</td></tr>
<tr><td>Class A</td><td colspan="3">The NFPA recommends that locations such as offices, Train, and assembly halls that contain mainly Class A combustible materials have one 2-A extinguisher for every 6,000 square feet (NFPA Standard 10, Table 5.2.1). OSHA requires that all employees have access to an extinguisher within 75 feet travel-distance.</td></tr>
<tr><td rowspan="6">Class B</td><td colspan="3">Locations that contain Class B flammables, such as workshops, storage areas, research operations, garages, warehouses, or service and manufacturing areas, must size and space their extinguishers based on the degree of hazard associated with the flammable liquids and gases in the area:</td></tr>
<tr><td>Hazard</td><td>Extinguisher</td><td>Spacing</td></tr>
<tr><td>Low - Small amounts of flammable liquids used for copy machines, art departments, etc., that are stored safely and kept in closed containers.</td><td>10-B</td><td>50'</td></tr>
<tr><td rowspan="2">Moderate - The total amount of flammable liquids is present in greater amounts than expected under low-hazard locations. This can include garages, workshops, or support service areas.</td><td>5-B</td><td>30'</td></tr>
<tr><td>10-B</td><td>50'</td></tr>
<tr><td rowspan="2">High - Locations where flammable liquids are present and used in large quantities. This includes areas used for storage, production, woodworking (finishing), vehicle repair, aircraft and boat servicing, or where painting, dipping, and coating, operations are performed with flammable liquids.</td><td>40-B</td><td>30'</td></tr>
<tr><td>80-B</td><td>50'</td></tr>
<tr><td>Class C</td><td colspan="3">Class C extinguishers are required where energized electrical equipment is used. The extinguisher size and spacing is based on its Class A or B hazard.</td></tr>
<tr><td>Class D</td><td colspan="3">Locations where combustible metal powders, flakes, shavings, or similarly sized materials are generated at least once every two weeks must install Class D portable fire extinguishers not more than 75 feet from the hazard.</td></tr>
</table>

5.7. INSTALLATION OF FIRE EXTINGUISHERS: To prevent fire extinguishers from being moved or damaged, they should be mounted on brackets or in wall cabinets with the carrying handle placed 3-1/2 to 5 feet above the floor. Larger fire extinguishers need to be mounted at lower heights with the carrying handle about 3 feet from the floor. Before installing any portable fire extinguisher, check the label to be sure it is approved by a nationally recognized testing laboratory.



CHAPTER 5 – CONFINED SPACE SAFETY PROCEDURES

6.1. INTRODUCTION:

a) BFS or outsourced vendors responsibilities in the normal course of duties as Facility/ Property Manager are to identify all permit required space to properly label each such area to prohibit entry, except for authorized contractors/ persons (fully trained and certified for confined space entry) and who to contact in the event of an emergency. It is intended to protect BFS employees from toxic, explosive, or asphyxiating atmospheres and from possible engulfment from small particles such as grain or sawdust. All such areas should not be entered by any BFS employee, without taking appropriate precautions. All such areas that pose health or safety risk, are prohibited and should be labelled "permit-required" confined spaces.

b) It is incumbent upon the Building Manager/ Property Manager/ Facility Manager to identify and list all "permit-required" spaces in their buildings, prevent unauthorized entry into them and to develop contact information for emergencies. Typical confined spaces that are "permit-required" include but are not limited to: boilers, storage vessels, furnaces, manholes, trash compactors, cooking and process vessels, and sump pump wells.

6.2. DEFINITION: A confined space is an area which has any one or multiple characteristics indicated below is deemed to be "Confined Space":

A. LIMITED NUMBER AND / OR SIZE FOR ENTRY AND EXIT FOR THE SPACE**:** Examples – Water tanks / Fuel or oil storage silos / Manholes in sewerage lines etc. Manhole sizes may be very small restricting fast movement. There may be just one manhole provided in a tank.

B. UNFAVOURABLE NATURAL VENTILATION: Example – Water and oil tanks are normally kept hermetically sealed to avoid contamination from outside, hence there is no natural ventilation. Manholes in sewerage lines may have some ventilation due to its widely connected network but may not be able to sustain life. Toxic or inflammable gases may occupy the spaces.

C. NOT DESIGNED FOR CONTINUOUS WORK ACTIVITY: Example **–** This could be material storage rooms in basement areas, with very low or no ventilation due to various reasons. May not have life-sustaining gases but may have other non-life sustaining or toxic gas concentrations.

D. Some of the confined spaces found in workplaces may have a combination of all the above characteristics, complicating the working within the spaces and emergency rescue operations. Hazards identification needs to be thorough and foolproof in all the above cases. In general, confined spaces are spaces that:

i. A person can enter to do work
ii. Have limited or restricted means for entry and exit
iii. Are not intended for continuous work

6.3. ATMOSPHERES:

A. HAZARDOUS ATMOSPHERES: The atmosphere within a confined space could become hazardous because of lack of natural air movement. This could lead to the atmosphere being:

i. OXYGEN DEFICIENT (LESS THAN 19.5%): An existing atmosphere within a confined space may be Oxygen deficient. Further Oxygen depletion could occur due to human physical activity within, welding, cutting, chemical reaction (rust formation, fermentation etc). Oxygen could get displaced by heavier non-life-sustaining gases such as Carbon dioxide or Freon or Hydrogen Sulphide. If the Oxygen level is less than 19.5%, entry is to be restricted and allowed wearing Self Contained Breathing Apparatus (SCBA) only.

ii. TOXIC: Toxic atmosphere could be found in confined spaces due to:

- ✓ Gases coming out of the residue left in the tank even after the bulk of the material have been evacuated. This could be sticking to the side walls or settled to the bottom of a tank. Dangerous Hydrogen Sulphide gas can emanate out of decomposed material.
- ✓ Even freshwater tanks could have hazardous gases such as Chlorine which is not life-sustaining.
- ✓ Bi products of work such as cutting / brazing / painting / cleaning / can form a hazardous mixture of gases within confined spaces.
- ✓ Gases from an adjacent compartment or workspace could enter a confined space and remain trapped there.
- ✓ Material handled could form concentrated toxic gas areas, even with partial ventilation. Sewerage inspection chambers could trap lethal gases from the sewer.

B. FLAMMABLE ATMOSPHERES: When three essential components, namely, (a) presence of Oxygen, (b) a flammable mixture of vapor / gases / dust and (c) a source of ignition are present together in a space, fire and explosion are inevitable. Different gases / vapor / dust have different levels flammability. A small electric spark from a motor or even a breaker contact could form the source of ignition. An oxygen enriched atmosphere (with more than 21% Oxygen) can cause inflammable material to auto-ignite and burn violently.

6.4. TESTING THE ATMOSPHERE: Never trust your senses to determine the presence or absence of gases in a confined space. Some of the toxic gases and vapours are colourless and odourless; hence you can neither see nor smell them. You cannot determine the level of Oxygen present also by your nose".

6.5. The prevalent atmosphere should be tested using properly calibrated instruments / miner's safety lamp etc. before "Safe to Work Certificates" are issued.

i. Some of the gases or vapours are heavier than air and tend to settle to the bottom of a confined space – Example, Hydrogen Sulphide or Steam which do not sustain life.
ii. Some for the gases are lighter than air and will rise to the top of a confined space – Example, Methane, which does not sustain life.
iii. Some of the gases may have the same density as air and will occupy the rest of the space – Example, Carbon Monoxide which does not sustain life.

a) It is essential that all the areas in a confined space are tested for presence of gases and absence of Oxygen. In both the cases, the area is to be ventilated using external air sources (Supply or Exhaust or Supply and Exhaust). The exhaust gases should be let out to well ventilate spaces, preferably open air.

b) If steam or inert gases have been injected into a confined space, the space needs to be ventilated before effecting personnel entry since both steam and inert gases are non-life sustaining. For example, some of the aviation turbine fuel tanks are automatically filled with Nitrogen as the fuel level falls.

i. Steam will increase the temperature of the space and the space is to be allowed to cool before allowing people to enter and work.
ii. Care should be taken so that no electrical spark is introduced into the confined space. The motor drive for the supply / exhaust fans and their controls should be outside the confined space.

c) After ventilating for about 24 hours, the confined space is to be re-tested for presence of hazardous gases and presence of life-sustaining levels of Oxygen. Personnel should be allowed to enter the compartment only when the test results are satisfactory.

d) Even after the atmospheric tests conducted in a confined space is deemed satisfactory, the condition can reverse due to the nature of work carried out within the space.

i. For example, if a metallic tank is chipped and cleaned initially and paint application has been done, the paint fumes are both hazardous and flammable.
ii. Another example is hot work such as cutting / brazing inside a confined space will reduce the Oxygen level and leave hazardous gases within.

e) In all cases, periodic monitoring is essential to ensure that confined spaces are safe to work within. This is applicable for carrying out hot work onto the confined space walls from outside as well. For example, if

hot work is to be carried out on to the metal sides of a confined fuel tank, the tank needs to be inspected and cleared as “Safe to work” periodically.

6.6. PERMISSIBLE VALUES: Some information and permissible values about the normally found gases in the confined space: -

a) OXYGEN- Required range is between 19.5% and 23.5 %

b) FLAMMABLE GASES—Less than 10% of LEL (Methane-LEL—5%)

c) TOXIC GASES (Generally found--- Hydrogen Sulphide and Carbon monoxide)

d) HYDROGEN SULPHIDE –It is a deadly gas, colorless with the smell of rotten egg, slightly heavier than air and will accumulate in the lower part of confined space. At concentration above 100 PPM, it has a paralyzing effect on the sense of smell. So, it is very difficult to relay on the smell to detect the presence of H_2S. An airborne concentration of H_2S over 100 PPM is immediately dangerous to life or health and can cause immediate collapse. The concentration to be maintained below 10 PPM for working.

e) CARBON MONOXIDE – Colorless, odorless and tasteless, caused by incomplete combustion, Impossible to detect by sight, smell or taste. Many people have lost their lives entering confined space with small concentration of this gas. Exposure to CO at concentrations over 350 PPM can cause confusion, fainting and collapse. Concentration above 1200 PPM is immediately dangerous to life or health. Permissible exposure limit (PEL) for carbon monoxide is 50 parts per million (ppm) parts of air as an 8-hour time-weighted average (TWA) concentration as per OSHA.

6.7. ISOLATION OF CONFINED SPACES: The confined space where work is to be carried out internally and externally should be isolated from all energy sources through “Lock Out Tag Out “processes as follows:

a) All electric circuits should be switched off and the incoming switch locked.
b) All other energy such as hydraulic and pneumatic air supplies should be bled till empty and the supply valves are to be shut and locked.
c) All mechanical drives such as belt or chain drives should be disconnected and stowed away.
d) All mechanical moving parts within a confined space should be secured safely.
e) The entry manhole cover should be opened and secured safely in the open position to avoid accidental closing.

6.8. MARKING OF PERMIT REQUIRED CONFINED SPACE:

XXX – Building Short Name
CS – Confined Space

6.9. OTHER HAZARDS: Confined spaces could also have other hazards such as:

a) Low ceiling height causing personnel to crouch and move inside. Chances of banging head onto appendages and the ceiling can exist.
b) Low or nil visibility since the space is not lit well.
c) Slippery surfaces due to stored chemicals and even water.
d) defective or missing ladder rungs in the space

e) Falling objects; this could be from people working at higher levels within the space or material being removed / being cut.
f) High temperature within the space due to exposure of the external surface to hot sun or low ventilation in the surrounding compartments. Periodic rotation of staff working inside is essential to reduce fatigue and dehydration.
g) Noise is another hazard. Sounds may get amplified beyond allowable limits, within the space.

6.10. PERSONAL PROTECTION EQUIPMENT: Though the list is not exhaustive, the following are considered essential:

a) Chemical suites in case of entering spaces containing hazardous chemicals
b) Industrial safety helmet, preferably with a miner's torch on it.
c) Breathing apparatus (Self-contained or with re-circulation depending on the space content and current state) when the Oxygen levels are low or hazardous gases are still present.
d) Ear defenders / plugs
e) Eye protection
f) Non-skid safety shoes with rubber soles and steel toe caps
g) Work gloves
h) Fall arrester or full body harnesses; to be used while entering and leaving the space and if working at a height within the compartment.
i) Safety communication and rescue rope lines. If the person working within the space is visible to the support person outside, rope communication lines are not necessary and voice communication can be resorted to.
j) Lead lamps from a low voltage DC source

Note: As part of the Hazard assessment, confirm whether the person entering the space can enter through the available opening, wearing all the protective gear and can be evacuated also in the same state. If not possible, alternative strategies will have to be devised.

6.11. SUPPORT & EMERGENCY TEAM:

a) No one should be allowed to enter a confined space without at least one person standby, manning the communication rope line, outside the space. The emergency rescue team should be in a quick access position to attend in case of emergencies.
b) Each person entering the space should have a buddy outside monitoring his progress.
c) The rescue process should be planned and practiced regularly. An unplanned rescue act could endanger other lives also.
d) The people entering confined spaces and the support team are to be fully briefed about the hazards, work needed to be done, work process flow, who-is-to-do-what, sequence of entry / exit, tools and other material to be carried etc.
e) First aid kits with all essential material should be kept handy near work, with the support team.
f) The communication signals should be mutually agreed and understood by all. These should be practiced too to identify the difference between a quick tug and a long pull. A Few examples are given below:
    i. One quick tug every 5 minutes would mean everything fine
    ii. Two quick tugs could mean that he needs something from top
    iii. Three quick tugs could mean he wants to send something up
    iv. Long pulling on the rope or frantic tugging means he is in trouble and needs help
    v. No tugs or pulls for more than 10 minutes would mean immediate assisted evacuation of the person from the space.

g) It is advisable to develop a "Standard Operating Procedure" (SOP) at respective IFM and Assest Management sites site for any work related to confined spaces, so that it becomes part of a standard drill by all concerned. An Entry Permit, essential prior to carrying out maintenance work in confined space is attached as Annexure-3 including format for register to enter names of employees entering/leaving confined and a Check List for preparing a confined space safe for maintenance work is attached at Annexure-2 to this manual.

6.12. ENTRY PROCESS: Before entry into a confined space, a risk assessment must be conducted, and a safe work method statement developed for the activity.

a) An entry permit is required to be issued to all persons intending to enter a confined space.
b) Confined space entry permits shall include all precautions and clear instructions for the safe entry and execution of works.
C. The person responsible for the direct control of work within the confined space is to be issued with the entry permit. They are to record that enters the confined space.
D. Suggested sequence for Safe Working in Confined Space is as under:

i. Isolate the space from Hazards
ii. Ventilate the space
iii. Conduct Toolbox Talk
iv. Complete entry permits form
v. Test the atmosphere using the Gas monitor (Prior to entry, after ventilation, at least every hourly or more frequently if suspicious)
vi. Posting attendant near entrance
vii. Enter the space
viii. Complete the work
ix. Permit cancellation

6.13. AFTER COMPLETION OF WORK: When confined space work has been completed the following actions should be taken:

a) All persons and equipment should be accounted for
b) All equipment is to be cleaned with any faults or problem reported and the equipment returned
c) Any problems and/or injuries to be reported
d) Permits and checklists to be signed by the authorized person

6.14. RECORDS: The following records should be maintained on file:

a) Entry permits for one month
b) The current risk assessment for the confined space for five (5) years from the time of its validity
c) Safe work method statements for all entries and activities within the confined space
d) Training records of employees for the duration of their employment

CHAPTER 6 – HOUSEKEEPING SAFETY

7.1. INTRODUCTION:

Good Housekeeping in the workplace not only creates a better working environment but also helps to reduce workplace hazards

7.2. DO'S AND DON'TS IN HOUSEKEEPING SAFETY:

a) Wipe the accidental spill immediately

b) Properly dispose of waste and scrap as it collects and ensure that it is placed in an appropriate receptacle. This includes flammable liquids, oily and paint covered rags, and paper trash

c) Keep cabinet doors and drawers closed

d) Keep stairways, aisles and walkways clear

e) Do not overfill racks, bins and storage spaces

f) Stack material neatly and properly- place heavy or bulky items on the bottom

g) Follow cleaning and maintenance procedures include lockout/tag out.

h) The most common cause of work-related injuries at any facility involves slips, trips and falls, accidents are the number one preventable type of accidents in the workplace.

i) We train ourselves to recognize potential hazards and report any we may find in our workplace. Slow down, remain steady, and be aware of our surroundings always.

7.3. HOW TO AVOID SLIPS, TRIPS AND FALLS:

a) Keep aisles, walkways and stairs clear

b) Always choose footwear that is appropriate for the work area

c) Ensure that there is proper lighting in the workplace

d) Dispose of unwanted material immediately

e) Use handrails while suing staircases and take one step at a time.

f) Clean up spills immediately

g) Keep ladders and stools in good condition and use them properly with an aid

h) Avoid built up of any grease in any location.

i) Do not leave the corners and under the furniture unclean to avoid unhygienic conditions

j) Stack material properly and keep the work area clean of clutters

k) Use Lock Out Tag out Signboards for different areas and applications in Housekeeping.

CHAPTER 7 –CAFETERIA & FOOD COURT MANAGEMENT

8.1. INTRODUCTION: Catering in which food is being handled, processed, cooked, stored, distributed in the Cafeteria/Food Court at Facility/Property and the persons handling them should conform to the sanitary and hygienic requirement, food safety measures and other standard as outlined in succeeding sections.

8.2. FOOD PREPARATION AREA: The following norms apply to rooms where food is prepared. There will be no smoke nuisance in the food preparation area. Wherever cooking or frying of any kind is being done, a chimney having appropriate suction capacity as per the size of the kitchen must be installed and periodical working, cleaning needs to be ensured.

A) HAND WASHING, CHANGE ROOM FACILITIES & TOILETS:

i. Adequate number of wash-hand basins made of porcelain/stainless steel shall be provided along with soap to wash hands, with hot and cold running water, and materials for cleaning hands and drying them hygienically.
ii. Separate sinks must be provided, where necessary, for washing raw food and cleaning equipment.
iii. Sinks with a draining board, detergent and hot water shall be provided to ensure proper cleaning of utensils, crockery and cutlery there will be a separate place for washing pots and pains.

B) CHANGE ROOM FACILITY: Change Room facility to Catering Vendor staff to change their clothes must be provided, as appropriate.

C) CLEANING:

i. Food areas and equipment between different tasks, especially after handling raw food shall be cleaned.
ii. The surface shall be thoroughly cleaned in case if somebody spills food / water / drink.
iii. A systematic cleaning schedule and instructions has to be developed by the vendor along with the Facility/Property team.
iv. Food handlers should strictly follow the systematic cleaning schedule to make sure that surfaces and equipment are cleaned when they need to be.
v. The schedule should include the following:
- what needs to be cleaned
- how often it needs to be cleaned
- how the cleaning should be done

vi. Cleaning instructions should indicate
- What cleaning products should be used
- How the products should be stored (away from raw, cooked, packed food) and used.
- How much they should be used or diluted
- How long that should be left in contact with the surface (following the manufacturer's instructions)

vii. Provide separate bins to collect dry waste and wet waste (organic) with proper permanent signages.
viii. On-site organic waste treatment system at campus level for handling organic waste generated

8.3. FOOD PREPARATION:

A) RAW MATERIALS:

i. Raw materials shall be purchased from reliable and approved vendors and checked for visible deterioration & off- odour.
ii. There should be no physical hazards and foreign body contamination i.e. raw paste, sauces etc. should be stored in properly covered containers made of food grade material and checked regularly for fungal growth, deterioration etc.

B) PREPARATION OF FRUITS/VEGETABLES:

i. Fruits and vegetables that have been protected from cross-contamination and properly conserved should be used.

ii. Whole fruits and vegetables should be washed in potable water before being cut, mixed with other ingredients. Uncooked, ready-to-eat fruits & vegetables should be with 50 ppm chlorinated water before cutting, peeling or serving.

iii. Fruits and vegetables should be peeled, squeezed and/or cut, as appropriate, with clean equipment/utensils made of non-absorbent food grade materials.

iv. Previously prepared fruits/vegetables should be kept in clean and properly covered food grade containers under refrigeration or at a maximum temperature suitable for the product.

C) PREPARATION OF NON-VEG ITEMS:

i. Raw meat and processed meat should be separated from other foods; items and surfaces.

ii. Separate items (e.g. cutting boards, dishes, knives) and preparation area for raw meats and poultry and marine products should be used to avoid cross contamination of food.

iii. Hands should be thoroughly washed before switching from preparing raw meat or poultry or marine products to any other activity.

iv. Ensure proper cooking of all non-vegetarian products.

v. Used surfaces should be washed with antibacterial cleaning agent, rinsed properly with water and sanitized after preparing raw meat/poultry.

vi. Ensure that frozen products are thawed as per point no. 9 under special requirements for high risk foods.

8.4. COOKING:

a) The preparation/ processing/ cooking should be adequate to eliminate and reduce hazards to an acceptable level which might have been introduced at the raw food level.
b) The preparation/ processing/ cooking methods should ensure that the foods are not re- contaminated.
c) The preparation/ processing/ cooking of veg. & non-veg. items should be segregated.
d) Whenever cooking or reheating of food is done, it should be hot all the way through,
e) It is especially important to make sure that food is cooked thoroughly.
f) Re-use of cooking oil should be avoided.
g) Food hot held at 60°c and cooled at 21°c within 2 hrs. or cooled to 5°c in 4 hours and thereafter refrigerated might be reheated.
h) Reheated food must reach a minimum internal temperature of 74°C.When using microwave to reheat, food must reach a minimum temperature of 74°C and stayed covered for 5 mins to allow the temperature to equilibrate.
i) Reheat food quickly in ovens, steamer, microwave oven and/or on top of range in a steam kettle.
j) Never reheat food on a steam table, in a bain-marie, in a bun drawer and/or under a heat lamp.
k) In case of reheating of oil use maximum three times to avoid the formation of trans fat.
l) It is ideal to use once if possible.

8.5. CHILLING:

a) Semi cooked or cooked dishes and other ready-to-eat foods such as prepared salads and desserts having short shelf life should not be left standing at room temperature.
b) Chilled food intended for consumption should be cold enough.
c) Food items that need to be chilled should be put straight away into the fridge.
d) Cooked food should be cooled as quickly as possible and then put it in the fridge.
e) Chilled food should be processed in the shortest time possible.
f) Fridge and display units should be cold enough and as per requirement.
g) In practice, fridge should be set at $5^{O}C$ to make sure that food is kept in chilled condition. Also, fridge and display units should be maintained in good working condition to avoid food spoilage and contamination.

8.6. CROSS CONTAMINATION: Following should be done to avoid cross – contamination:

a) Raw food/ meat/poultry and ready-to-eat foods should be kept separate always.
b) Hands should be thoroughly washed after touching raw meat/poultry.
c) Work surfaces, chopping boards and equipment's should be thoroughly cleaned before the preparing of food starts and after it has been used.
d) Separate chopping boards and knives for raw fruit/ vegetables/ meat/poultry and ready-to-eat food should be used.
e) Raw meat/poultry below ready-to-eat food should be kept in the fridge.

f) Separate fridge for raw meat/poultry should be kept.
g) Staff should be made aware how to avoid cross-contamination.

8.7. PERSONAL HYGIENE:

a) High standards of personal hygiene should be maintained.
b) All employees handling food should wash their hands properly:
   i. before preparing food,
   ii. after touching raw food or materials, specially meat/poultry or eggs
   iii. after breaks
   iv. after using the toilet
   v. after cleaning the raw materials or utensils / equipment's
c) Street shoes inside the food preparation area should not be worn while handling & preparing food.
d) Food handlers should ensure careful food handling & protect food from environmental exposure.
e) Food handlers should not handle soiled currency notes to avoid cross contamination.

Note: The Facility/Property team will conduct periodical check to the vendor kitchen to ensure the compliance to the requirement. The Vendor Kitchen audit shall be conducted as per the Vendor Kitchen Hygiene & Audit Checklist placed at Annexure 9 to this manual.

8.8. TRANSPORTATION & HANDLING OF FOOD:

a) The vehicle/transportation being used to carry cooked/prepared/processed food should be clean and, dedicated for this purpose and should not carry anything else.
b) Time required for transportation should be minimum, to avoid microbial proliferation.
c) Cooked food served hot should be kept at a temperature of at least 60^0 C to prevent microbial growth.
d) Cooked food to be served cold should be kept below 5^0C to prevent growth of pathogens.
e) All foods during transportation must be kept covered and in such a way as to limit pathogen growth or toxin formation by controlling time of transportation, exposure, temperature control and using safe water for cleaning etc.
f) Handling of food should be minimal. It should be ensured that utensils, crockery, cutlery and specially hands of the food handlers/seller are clean and sanitized.
g) All surplus food and unused thawed food should be discarded.
h) Food to be kept for cold storage should be distributed in small volumes to ensure uniform cooling.
i) Dry, fermented and acidified foods should be stored in cool and dry place.
j) All packaged food viz. sterilized milk; bottled beverages, canned foods etc. should be stored properly during transportation to ensure that seals remain intact and undamaged.

8.9. STORAGE: It is very important to store food properly for food safety and following precautions must be ensured:

a) Foods should be cooked, stored and kept at right temperature
b) Raw meat/poultry should be stored separately from other foods
c) Veg. foods should always be stored above non-veg. foods and cooked foods above uncooked foods on separate racks in the refrigerator.
d) Storage temperature of frozen food should be -18ºC or below.
e) Cooked food to be eaten later should be cooled quickly and kept it in the refrigerator. It is advisable to put date on food packages or containers, using stickers or any other way of identification, before keeping inside the refrigerator to keep track of food prepared date wise and use accordingly to minimize wastage.
f) Storage instructions over food packaging should be followed.
g) Dried foods (such as grains and pulses) should be stored off the floor, ideally in sealable containers, to allow proper cleaning and protection from pests.
h) Stock Rotation: The rule for stock rotation is FIFO (first in, first out) to make sure that older food is used first. This will help to prevent wastage.

8.10. SPECIAL REQUIREMENTS FOR HIGH RISK FOODS: This section deals selectively with varieties of food which are high risk as per HACCP and may need special attention. The type of foods covered here are as follows:

A) CUT FRUITS/SALADS, FRESH JUICES & BEVERAGES:

i. Fresh fruits /vegetables cut or juiced should be used immediately; however, short storage should be only under refrigeration in sanitized and properly covered vessels.
ii. Water used in beverages should be potable.
iii. Ice used should be made of potable water only.
iv. Food or beverages should not be stored in the same container used to store the ice intended for consumption.
v. Juice concentrates must be checked regularly for any fungal growth / change of colour, odour or gas formation in the bottle.
vi. Juice dispensing machine should be cleaned and rinsed with water regularly.

B) CONFECTIONARY PRODUCTS:

- Prepared confectionery products should be kept in airtight containers and displayed hygienically.
- Cream to be used should be stored covered under refrigeration.
- Finished products should be refrigerated with proper labels indicating date of expiry.
- Products should be properly wrapped/ packaged after proper cooling.

C) MEAT, POULTRY & FISH PRODUCTS:

i. Non-veg products/raw materials should be purchased (chilled products temperature should be at 5^0C or below and frozen products at -18 degree C or below) from authorized/ licensed slaughterhouses/vendors.
ii. Processing area should be cleaned and disinfected promptly.
iii. Preparation and processing of meat, poultry and marine products should be separate.
iv. Non-veg. products are washed with potable water before use.
v. Non-veg. products are cooked thoroughly (core temperature 75^0C) for at least 15 seconds or an effective time/temperature control e.g. 65^0C for 10 minutes, 70^0C for 2 minutes.
vi. Non-veg. products should be stored covered in refrigerator below the veg. products.
vii. Raw and cooked products should be stored physically separated with cooked products at the top.
viii. All refuse/waste should be promptly removed from preparation area.

D) WATER BASED CHUTNEY & SAUCES ETC:

i. All fruits/vegetables should be washed properly before processing.
ii. Clean and disinfected chopping boards/grinding stone/machine should be used.
iii. Personal hygiene of food handlers needs to be ensured.
iv. Water used in the chutneys should be safe and potable.
v. Only permitted food additives should be used, if required, and be added in recommended quantities only.
vi. Spoiled products should be discarded immediately after confirmation of spoilage (change in colour/texture/ odour).
vii. Sauces and chutneys should be stored in glass/food grade plastic containers with proper lids.
viii. Clean and intact containers should be used for storing sauces and chutneys.
ix. Sauces and chutneys should be stored in refrigerator when not in use.
x. Perishable/uncooked chutneys should be consumed immediately.

E) FOODS TRANSPORTED FROM THE POINT OF COOKING TO THE POINT OF SALE:

i. Food should be reheated more than 74^0 C before consumption.
ii. Food should be consumed or served for consumption within 4 hours of reheating.

FOODS WITH GRAVY:

i. Food products should not be stored at room temperature for more than 2 hours during display or sale.
ii. For prolonged storage, foods should be stored in refrigerators or kept for hot holding at or above 60°C.
iii. No water should be added after cooking/reheating/boiling.

FRIED FOODS:

i. Good quality / branded oils/fats should be used for food preparation, frying etc.
ii. Use packaged oil only.
iii. Use of oils with high 'trans' fats (like vanaspati) should be avoided as far as possible.
iv. Re-heating and reuse of oil should be avoided as far as possible.
v. Avoid using leftover oil wherever possible.

ADDING INGREDIENTS AFTER COOKING:

i. Ingredients added to the cooked food should be thoroughly washed/ cleaned.
ii. After cooking or post cooked mixing, the food should be used immediately.
iii. Garnishes etc., if added, should be prepared using fresh, thoroughly washed and freshly cut vegetables and used immediately.
iv. Reuse of cooked food is not recommended.
v. Potentially hazardous foods and high-risk foods such as hollandaise sauce, refried beans, scrambled eggs and cut fruits are to be discarded.
vi. All food at banquet setting that has been on display is to be discarded.
vii. Food kept at more than 60°C during service may be reused, only by following the procedure indicated below:
   - ✓ Never mix leftover with fresh product. If in doubt, throw out the product.
   - ✓ Reheat leftover food temperature to more than74°C

THAWING (DEFROSTING) OF FROZEN FOODS:

i. Thawing-In Refrigerator: The Items being thawed should be labelled with defrost date to indicate the beginning of 2nd shelf life.
ii. Thaw food at 5°C or less.
iii. Temperature controlled thawing is recommended for meat, poultry and fish.
iv. Any other means of thawing apart from running water and microwave is not allowed.
v. Thawing in Running Water- Items being thawed should be labelled with date and time.
vi. Thawing in running water advisable for shellfish and seafood.
vii. Thawing in running water should not exceed 90 minutes.
viii. Ensure air break between tap and water.
ix. Use sanitized food grade container.
x. Sink must not be used for other purposes during thawing
xi. After thawing, product must be used within 12 hours.
xii. Cold running water (from mains) should be at 15°C or less

CHAPTER 8– HYGIENE & WASTE MANAGEMENT PROCESS

9.1. INTRODUCTION: Designing a simple and reliable waste collection system to maintain hygiene in facility with a materials flow plan that will work is must. Some facilities place recycling collection bins in central locations in hallways, others place a bin in each individual guestroom or just ask guests to leave recyclables in a specified location in their rooms (such as on a table) so that housekeeping staff can collect and separate different types of items. Ask the following questions when choosing a storage site for recyclables:

a) Is the site large enough?
b) Can the site be locked?
c) Is the site protected with sprinklers?
d) Is there easy access to a loading dock?

9.2. RECYCLING: Support recycling by buying products made from recycled material. One of the keys to make the recycling effort work, especially in a way that is efficient for both cleaning personnel and occupants, is to develop clear facility goals and procedures. It is important to enlist the occupants to sort their recyclables and clearly mention as to what recyclables are to be collected and where they are to be placed. Recyclables that contained food such as cans should be rinsed out by the user prior to being placed in collection bins to minimize the potential for attracting pests. On-site organic waste treatment system at campus level for handling organic (food and garden/landscape) waste generated.

9.3. TYPES OF WASTE: BFS/Vendor on-site team will manage all types of waste collected from the premises / building floors (if included in SLA/Contract Agreement) in a proper manner with the help of sub-vendor housekeeping team and through outsourced agencies or as per SLA contracted. Waste can be defined and separated in two categories i.e. Recyclable and Non-Recyclable waste.

9.4. RECYCLABLE WASTE:

a) Paper Products
b) Tetra packs
c) Beverages Can
d) Stirrers
e) Used Paper cups
f) Packing,
g) Tissues
h) Food Containers

9.5. NON- RECYCLABLE WASTE:

a) Solid Waste
b) Sachets
c) Solid paper plates
d) Aluminium coated paper plates
e) Plastics

9.6. SEGREGATION/DISPOSAL PROCEDURE:

a) Facility/Property Staff should be aware of safe segregation, transport and safe disposal procedures of waste Management.
b) Composting Treatment: Dry waste, wet waste, Cafeteria waste, non-hazardous waste etc.
c) Facility/Property should conduct Waste survey to identify - source, composition to arrive at its reusability and recyclable potential
d) Site HK team should be trained on segregated collection, handling and storage for different streams of Wastes (Dry – Paper, Plastics, Cartons, metals, etc., Wet – Cafeteria Leftover food, tea bags, leaf litter, etc.)

e) Facility/Property team should conduct programmes to raise the awareness of employees for the optimum use of resources / segregation of waste into Wet and Dry categories, through mailers, posters, awareness programmes, exhibits, labelled dustbins, etc.

9.7. WASTE MANAGEMENT PROCESS:

a) LABELLING: Non-Hazardous Bins/Containers must be labelled in accordance with the type of waste (E.g.: Dry Waste, Wet Waste, Recyclable Waste etc.

b) STORAGE: Non-Hazardous substances must be stored on site and stored in dedicated, secure and adequately designed areas or enclosures and to be segregated into similar categories for disposal (E.g.: Wet Waste, Dry Waste etc.)

C) HANDLING:

i. All staffs that handles waste must be trained on Waste collection, Awareness about MSDS, to use adequate PPE's and Safe disposal
ii. Provide separate bins for different types of Waste by proper labelling and demarcation.
iii. Try to segregate the waste at the source level itself.
iv. Use proper PPE's while handling and transporting the waste to the interim storage areas.
v. Do a thorough waste segregation in appropriate bags or covers and store it for safe disposal / recycle.
vi. Maintain hygienic atmosphere in the interim storage area
vii. Dispose the waste to the authorized vendor for safe reuse or recycle.
viii. Conduct the survey to identify the areas of waste generation sources.
ix. Raise the awareness about Optimum use of resources and segregation of waste into Wet and Dry categories
x. Housekeeping personnel should be trained about safe collection, segregation, Handling and transfer of waste
xi. Collect the waste from source at regular intervals by using proper PPE's
xii. Provide secondary level segregation and transfer the respective streams of waste into large container safely and transport internally to the designated interim storage area
xiii. Non-Hazardous waste should be disposed to authorized vendor after thorough evaluation.
xiv. Maintain proper inventory of the waste disposal in the waste management format
xv. Provide separate bins to collect dry waste (paper, plastic, metal, glass etc.) and wet waste (organic) with proper permanent signages at all the floors and common areas of the building as applicable. Divert the collected waste to a centralized facility, which is easily accessible for hauling. In addition to dry and wet waste bins, provide separate bins for safe disposal of hazardous waste at centralized facility: Batteries, e waste, Lamps Medical waste etc.
xvi. For renovation works/new construction – proper procedure for Construction and Demolition waste to be followed – Recycling and Reuse and minimizing the quantity of construction waste to landfill

9.8. HAZARDOUS WASTE DISPOSAL PROCESS:

HAZARDOUS WASTE DISPOSAL PROCESS			
STEPS	**FORM NO.**	**PURPOSE OF FORM**	**FREQUENCY/ WHEN TO USE**
Take the authorization from SPCB	Form 1	Application for obtaining Hazardous waste authorization from SPCB.	Once/ At the time of Authorization
Maintain authorization granted by SPCB and follow all conditions maintained.	Form 2	Form for grant of authorization by SPCB.	Once / By SPCB at the time of authorization

Maintain regular monthly inventory of hazardous waste.	Form 3	For maintaining records of Hazardous waste	Monthly/ By facility for records of Hazardous waste
Submit the hazardous waste returns to SPCB annually with last date June 30th every year.	Form 4	For filling Annual returns of Hazardous waste	Yearly / By facility for Annual Hazardous waste return
Formal information to SPCB on company letterhead prior to disposal of hazardous waste from your facility.	Form 6	Information to SPCB	At the time of disposal.
Marking of hazardous waste container at the time of storage and transportation to be done according to format given in law.	Form 8	Marking of Hazardous waste container	Once/ For marking in each container used for storing Hazardous waste.
Disposal vendor will prepare TREM card to be kept with Driver of the vehicle during transportation.	Form 9	Transport Emergency Card	Any time/ From facility to driver of vehicle used in transporting Hazardous waste
Disposal vendor will make 6 different colored copies of hazardous waste manifest and that also should be given to all relevant (see reference attachment after expanding)	Form 10	Hazardous waste manifest	Any time/ Provided by vendor to facility while taking Hazardous waste from site.
In case of any accident during temporary storage and transportation of hazardous waste, this form will be applicable.	Form 11	Format of Accident Record	Any time/ in case of accident

MANIFESTO – FORM10	
COPY NUMBER WITH COLOUR CODE	PURPOSE
Copy 1 (White)	To be forwarded by the occupier to the State Pollution Control Board or Committee.
Copy 2 (Yellow)	To be carried by the occupier after taking signature on it from the transporter and the rest of the four copies to be carried by the transporter.
Copy 3 (Pink)	To be retained by the operator of the facility after signature.
Copy 4 (Orange)	To be returned to the transporter by the operator of facility/recycler after accepting waste.
Copy 5 (Green)	To be returned by the operator of the facility to State Pollution Control Board/Committee after treatment and disposal of wastes.
Copy 6 (Blue)	To be returned by the operator of the facility to the occupier after treatment and disposal of hazardous materials/wastes.
Copy 7 (Grey)	To be sent by the receiver to the State Pollution Control Board of the sender in case the sender is in another State.

9.9. WASTE MANAGEMENT 3R PRINCIPLE:

a) Encourage, design and implement packaging waste reuse, recycling initiatives to all users through, awareness building, training, rewarding, etc.
b) Recognize and encourage employees who reuse/recycle envelops, containers, carton boxes, etc.
c) Educate staff to avoid over packaging, over stapling and over sticking, so that the packaging can be again reused by someone.
d) Prepare waste Management Plan, along with cost incurred for Non-Hazardous Waste transportation / recycling / disposal which are documented & maintained.
e) Identify probable vendors for recycling various waste generated in the location

CHAPTER 9 – CHEMICAL MANAGEMENT

10.1. INTRODUCTION: The chemical management identifies the responsibilities and requirements for managing chemicals and chemical products that are purchased, used, stored or made available in facility by / to service provider. A good chemical management at site ensures healthy workplace with minimal exposure of chemicals and its fumes to occupants that do not affect the employees' health working in premises.

10.2. APPLICABILITY: Within a location it applies to all processes where in there exists a likelihood of chemicals as listed below and not limited to:

a) Equipment operation, maintenance, and service at DG area.
b) Building maintenance and service
c) Housekeeping and cleaning activities
d) Application of pesticides, herbicides, fungicides, and fertilizers
e) Product maintenance and service
f) Pantry
g) Cafeteria
h) Electrical room

10.3. DEFINITIONS:

a) CHEMICAL: A substance with a distinct molecular composition. It can be gaseous, liquid or solid. Examples in a building: Gaseous – CO_2, O_2, Acetylene etc. Liquid: Housekeeping chemicals like R1, R2, R6 and paints, diesel lube oil etc. Solid: Dry chemical powder in fire extinguishers, sodium chloride, sodium bicarbonate etc.
b) MSDS: MSDS stands for Material Safety Data Sheet. It is a data sheet having all relevant details of a chemical with important sections like chemical constituents, nature of chemical, handling procedure, first aid measures in case of spill, emergency contact information.
c) CONTAINER: Any portable bag, barrel, bottle, box, can, cartridge, cylinder, drum, or packaging that contains a chemical or chemical mixture.
d) HAZARDOUS CHEMICAL: A chemical, which is a physical, environmental, or health hazard according to applicable legal requirements.

10.4. RESPONSIBILITY:

a) Facility / Property Manager is responsible for overall monitoring and auditing of the Chemical Management Processes on regular basis.
b) Housekeeping Personnel is responsible for implementing and update the chemical inventory status on monthly basis to Facility / Property Manager.

10.5. PROCESSES:

a) Locations shall maintain the list of chemicals (Hazardous and non-hazardous) used in the form of a chemical inventory.
b) Consumption of all chemicals shall be monitored with maintaining record of monthly chemical consumption at site.
c) MSDS of all chemicals shall be available always with the facility records and the summary of MSDS will be displayed at chemical storing locations in the language known by users of chemicals.
d) Hazardous chemicals shall be stored separately with provision of secondary containment if possible and hazardous warning displayed on container.
e) Facility Manager or representative will ensure regular training to the housekeeping personnel for overall safe chemical management.
f) Use of Personal Protective Equipment while handling chemicals and adequate training to be ensured.
g) The secondary containment system wherever provided is to remain dry and any releases to the secondary containment system from the primary containment system must be cleaned up immediately.

CHAPTER 10 – SAFETY AT HEIGHTS

11.1. INTRODUCTION: Safety at heights is the basic requirement for the kind of work carried out in BFS Facility/Property Sites. There are regulations for working on heights and for use of scaffoldings and ladders. It is imperative to make sure that the contractor's labour on site is well trained, certified and has extensive training on the machinery to be used, how to use them, safety features and practices.

11.2. Since window/façade cleaners scale and descend buildings that are more than 50-meter-high, it is imperative that cleaners be medically checked for ailments that could affect their performance. This medical examination needs to be carried out at the time of induction into the company/contract. As per laid-down Standards, a cleaner working at heights must be medically checked for:

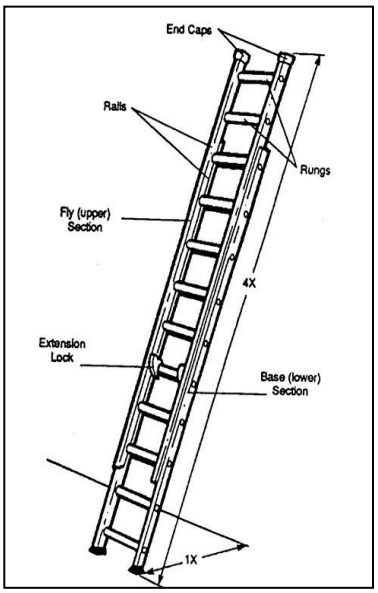
a) Heart disease
b) High or low blood pressure
c) Epilepsy / Fits / Vertigo
d) Giddiness / difficulty with balance
e) Impaired limb function
f) Alcohol or drug dependence
g) Psychiatric Illness
h) Obesity
i) Diabetes

11.3. Training is another aspect that should be imparted before a cleaner is selected for cleaning at heights. Employees for such activities are to be trained and certified after a rigorous practical programme. A basic rope access kit would typically include the following:

a) WORKING LINE: This is the main line with which the worker descends
b) SAFETY LINE: The line adjacent to the main line. Worker should be connected to both lines
c) ASCENDER: Used when the cleaner needs to climb up the rope
d) BACK-UP DEVICE: A back-up rope adjustment device attached to the back-up safety line protects the technician from a fall, if the main working line fails or if the technician slips or loses control in any way. The back-up device is intended to lock on to the safety line without causing damage to the rope, and absorbing any shock load that may occur, thus preventing a fall from occurring.
e) HELMET: A helmet is used to provide head protection to the wearer from injury of any type.
f) CHEST HARNESS: A chest harness is used to convert a regular work positioning harness into a fall arrest harness, with a suitable attachment to connect the two. The chest harness is worn around the upper body when working and is essential for ascending the rope. The ascending device is usually attached between the chest harness and the sit harness thus connecting the two harnesses for total body support. This harness will keep the cleaner safe in event of the failure of the rest of the equipment as he is preparing to climb down a building.
g) CHEST ASCENDER: An ascender is a rope adjustment device which, when attached to an anchored rope of appropriate type and diameter, locks under load in one direction and slides freely in the opposite direction.
h) WORK HARNESS: Used while coming down the building.
i) DESCENDER: A descender is a manually operated, friction inducing, rope adjustment device, which when attached to an anchored rope of appropriate type and diameter, allows the user to achieve a controlled descent and to stop with hands off anywhere on the anchor line. Descender are normally used in industrial rope access for descending the working line or positioning the operative.

11.4. Besides the above features, it is important to install safety anchors on the sides of the buildings before commencing descend for cleaning. Chemically grouted anchors called safety anchors that have been tested for a pull-out load of 1000 K should be fixed into the RCC. The main and the safety lines go through the

two eye holes of the anchors to safeguard against accidents in event of the any single bolt getting unplugged. The anchors need to be retested on an annual basis.



11.5. Since labour usually is less educated and is skilled only at a trade, it is important to have trained and educated supervisors who can check the equipment, usage and give safety instructions to workers.

11.6. Ideally it is recommended that rope access cleaning should not be carried out on buildings more than 12 floors. For higher or taller buildings, it is recommended to use Cradles or Temporary Platforms which have a full range of safety features and therefore are more reliable and efficient for façade cleaning.

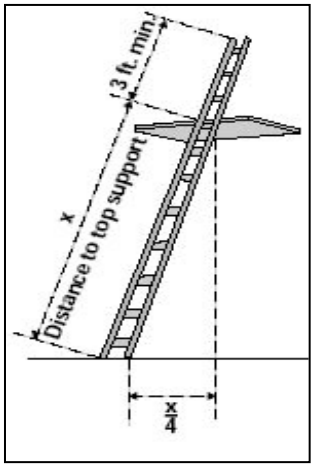
11.7. If the lower limit rod at the bottom of the Cradle touches anything like a canopy or the 'chajja' of a window, it will stop. Similarly, the upper limit rod at the top of the cradle also forces the cradle to stop in the event of it coming in contact with kind of object. Inside the cradle, there are wheels which reel in the ropes safely. Cradles are also equipped with buffers in front to ensure that the glass on the façade is not damaged. The anti-tilting device ensures that the cradle comes to a halt if it has a tilt of more than 14% angle. Roof rigs are another area of concern. They are very often badly placed, and the required counterweights are missing. A roof rig with insufficient counterweight will cause the cradle to collapse.

11.8. The latest area of concern for façade cleaning companies is metal roofs. Airports and factories have metal roofs and regular cleaning of such roofs is a challenging task. Fall prevention systems are a must to ensure that the worker/cleaner does not fall of the edge of the roof at any given point. He is anchored with a rope to a certain point on the roof itself. Roof top walkways are also a solution for walking across metal roofs.

11.9. Use of Safety nets while carrying out works

11.10. GENERAL GUIDELINES ON LADDER SAFETY:

a) ACCESS: Ladders should be supplied to employees when there is an elevation break of 19 inches or more and when there is only one point of access between levels.
b) LADDER TYPE: Selecting the right ladder for the job is the first step to ladder safety. Ladder type is defined by how much weight the ladder can support.
c) All ladders have a designated maximum load capacity. In general, ladders can support at least four times their maximum intended load.



d) LADDER STRUCTURE: Should never be painted. Must have non-conductive side rails for any work near electrical equipment. Step ladders not to exceed 20 feet in length under any circumstances.
e) LADDER USE: Ladders are only used for the purpose designed and DO's & DON'Ts are as under:
   i. Perform a daily inspection of the ladder.
   ii. Never alter a ladder to fit specific needs, as this could increase the potential of injury.
   iii. Never allow two people on a ladder at the same time.
   iv. Never stand on the top rung of the ladder.
   v. When on a ladder, never carry any object that would cause a loss of balance.
   vi. Do not overreach. Move the ladder as the work progresses.
   vii. Do not jump or slide the ladder while on it; step down and move the ladder as necessary.
   viii. Always face the ladder and use both hands for stability when ascending or descending.

ix. Always secure the top of the extension ladders.
x. Always place ladders on stable and level surfaces with secure footing.
xi. When accessing a roof, the top of the ladder must extend at least three feet above the point of support.
xii. Always support the side rails of extension or sectional ladders.
xiii. Check for overhead wires or electrical hazards before erecting or working from any ladder. Never use a metal ladder or a ladder with metal reinforced rails near exposed electrical circuits or insulation.
xiv. If the ladder is more than six meters in length and not secured at the top the regulations specifically require another worker to hold the ladder until it is secured or tied off at the top.
xv. An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
xvi. Use fall arrestor if working on ladder at a height greater than 6 feet.

F) LADDER PLACEMENT:
i. Ladders are placed on stable and level surfaces free from any debris.
ii. While placing an extension ladder next to a wall, the distance from the wall must be equal to one-fourth of the vertical height of the ladder.
iii. If the ladder is placed near a door or aisle, a helper holds it at the bottom, with warning signs and barricades placed around the work area.
iv. If a ladder must be used in an area of uneven ground or on stairs, a set of levellers, affixed to the sides of the ladder, are to be used. Levellers are available from tool supply dealers.

g) LADDER MAINTENANCE: Employees must inspect ladders before use to identify problems or potential hazards and enter the details in a Logbook for Ladder Inspection.

CHAPTER 11 – PPE PROGRAM & SIGNAGES

12.1. INTRODUCTION: The purpose of the Personal Protective Equipment (PPE) Program and signage's is to protect the employees from exposure to workplace hazards and the risk of injury using personal protective equipment. PPE is not a substitute for more effective control methods and its use will be considered only when other means of protection against hazards are not adequate or feasible. It will be used in conjunction with other controls unless no other means of hazard control exist.

12.2. RESPONSIBILITY:

a) Facility / Property Manager are responsible for implementation of PPE program including signages, as appropriate. This involves:

i. Ensuring sufficient PPE is available for the site team.

ii. Providing training, guidance, and assistance to supervisors and employees on the proper use, care, and cleaning of approved PPE.

iii. Periodically re-evaluating the suitability of previously selected PPE and record the physical inspection of PPEs at least on monthly basis.

iv. Availability of suitable signage's and display during work, as appropriate.

v. For any renovation works in the building/on the floors, workers should use/follow proper PPE

b) Housekeeping and Technical Supervisor is responsible for following PPE program. This involves:

i. Providing appropriate PPEs to the employees engaged in hazard involving activity.
ii. Ensuring that employees are trained on the proper use, care, and cleaning of PPE.
iii. Ensuring that employees properly use and maintain their PPE and follow PPE policies and rules.
iv. Notifying the manager when new hazards are introduced or when processes are added or changed.
v. Ensuring that defective or damaged PPE is immediately disposed of and replaced.
vi. Display signage's (Wet Floor, Cleaning in Progress etc), as appropriate.

12.3. . STANDARD SIGNAGE'S: List with types of signage's useful at IFM & Asset Management sites is placed at Annexure 12 to this manual.

CHAPTER 12 – ERGONOMICS

13.1. INTRODUCTION: Ergonomics (or human factors) is the scientific discipline concerned with understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design to optimize human well-being and overall system performance. In simple words it is the study of human abilities and characteristics which affect the design of equipment, systems, and jobs. The terms ergonomics and human factors can be used interchangeably. There are two principles of Ergonomics:

a) Fitting the person to the job.
b) Fitting the job to the person.

13.2. EXAMPLES OF WHAT CAUSES POSSIBLE ERGONOMICS ISSUES:

a) SITTING: Sitting in one place for long periods is a risk because it slows blood circulation. Continuously holding your elbows bent in the palms-down position strains the nerves and muscles of the arms and upper body. Poor sitting habits compound the problem. For example, leaning on your elbow can compress the nerve, or sitting on one foot can impede circulation in your legs.

b) REPETITIVE MOVEMENTS: Making the same movements again and again, such as typing numbers into a spreadsheet or circling a mouse or trackball, tires the muscles. You can be injured by as little as two hours of using the computer mouse per day and are in the danger zone at four hours per day. Working for extended periods without taking breaks does not allow the muscles time to recover from the exertion.

c) STATIC LOADING: Staring at the monitor without doing much at all--sometimes referred to as static loading.

13.3. ERGONOMICS TIPS FOR COMPUTER WORKSTATIONS:

a) Set the height of the chair so that your thighs are roughly parallel to the floor, with your feet flat. If necessary, use a footrest to support your feet.

b) Use a fully adjustable chair (i.e., for seat height, backrest tilt and seat pan tilt). It should have a well formed lumbar (lower back) support to help maintain the lumbar curve.

c) Make sure the arm rests don't interfere with natural movements and/or are adjustable.

d) Ensure the chair does not put pressure on the back of the legs. There should be enough space between the front edge of the seat pan and the back of your knee/lower leg to fit one finger up to one fist.

e) Set your monitor at a height that allows you to keep your neck straight. The top of the screen should typically be at or slightly below eye level.

f) Your elbows should be at an angle of 90 degrees, with your arms hanging naturally at your sides.

g) Keep your hands in line with your forearms, so that wrists are straight, not bent up, down or to the side. The mouse should be directly beside the keyboard.

h) Use a document holder to hold source documents adjacent to the monitor.

13.4. QUICK ERGONOMICS TIPS:

a) Avoid bent, twisted and extended postures.

b) Avoid zigzag movement and use rhythmic movements.

c) Do not keep any one posture for a prolonged time.

d) Adjust illumination source to avoid glare.

e) Keep the tools within easy grasp.

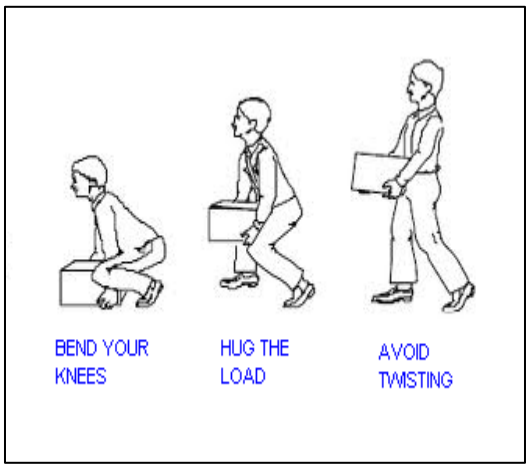
Note: In case of any ergonomics related issue with client, facility / property manager or representative can provide general tips to employees and will give regular basic training to its own team on general ergonomics related to work performing in routine

CHAPTER 13 – MATERIAL HANDLING PROCESS

14.1. INTRODUCTION: This program provides guidelines for the prevention of occupational injuries associated with materials handling and lifting tasks etc. at BFS IFM and Asset Management Sites. Job tasks involving materials handling are analysed to eliminate or minimize potential hazard exposure. Analysing the manually performed materials handling tasks that occur in the workplace at IFM and Asset Management Sites is one part of an overall job hazard identification process and an ongoing part of the safety program.

14.2. DO'S & DONT'S:

a) Avoid lifting and bending whenever you can.
b) Bend your knees while lifting. This helps to keep your spine in a better position.
c) Follow these steps while lifting:
   i. Take a balanced stance with your feet about a shoulder-width apart. One foot can be behind the object and the other next to it.
   ii. Squat down to lift the object but keep your heels off the floor. Get as close to the object as you can.
   iii. Use your palms (not just your fingers) to get a secure grip on the load. Make sure you'll be able to maintain a hold on the object without switching your grip later.
   iv. Lift gradually (without jerking) using your leg, abdominal and buttock muscles and keeping the load as close to you as possible. Keep your chin tucked in to keep a relatively straight back and neckline
   v. Once you're standing, change directions by pointing your feet in the direction you want to go and turning your whole body. Avoid twisting at your waist while carrying a load.



d) When you put a load down, use these same guidelines in reverse.
e) Reduce the amount of weight lifted. If you're moving a bunch of books, better to load several small boxes than one extremely heavy load.
f) Use handles and lifting straps.
g) Get help if the shape is too awkward or the object is too heavy for you to lift and move by yourself!
h) If you know that you're going to be doing work that might be hard on your back, take the time to stretch your muscles before starting, just like a professional athlete would do before a workout.
i) If you're doing a lot of heavy, repetitive lifting, take it slowly if you can.
j) Allow yourself more recovery time between lifts, as well. Don't overdo it.
k) Take frequent, short (micro) breaks.
l) Stretch. If you've ever been working in an awkward position for a long time, then stood up and felt stiff and sore, you know you've been in that position too long, and your body is now protesting.
m) Taking a one-minute stretch break every now and then can help you avoid that.

CHAPTER 14– INDOOR AIR QUALITY (IAQ)

15.1. INTRODUCTION: We spend more time in indoors than outdoors at IFM/ Asset Management sites. The pollutant levels are often higher in indoors than outdoors. The Health impacts and medical expenses due to exposure to Indoor air pollution is more comparing with Outdoor air pollution. The people concentrate on ambient air quality and pollution abatement. Indoor air pollution has a greater potential and impact on our health due to long exposure (~25-200 times) than the outdoor environment.

COMPARISION BETWEEN THE OUTDOOR & INDOOR ENVIRONMENT	
OUTDOOR	INDOOR
Access is universal	Access can be restricted
Costs nothing to use	Cost to condition and distribute Table Bullets
Contaminants can interfere with health, productivity, & enjoyment	Contaminants can interfere with health, productivity & enjoyment
National Standards	Site Specific Standards

15.2. FACTORS AFFECTING INDOOR AIR QUALITY: Factors affecting IAQ are temperature, humidity and Air Movement, as under:

a) TEMPERATURE: The temperature level at which people feel comfortable will depend on activity levels, age and natural body temperature which will vary from individual to individual, and on seasonal temperatures.

b) HUMIDITY: Humidity influences thermal comfort by affecting the human body's ability to lose body heat through perspiration.

c) AIR MOVEMENT: Airflow is determined by ventilation and convection Currents.

15.3. WHEN IS THE AIR GOOD?

a) According to the American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), air quality is acceptable when "when there are no known contaminants at harmful concentrations and when a substantial concentration (80%) of people exposed to air, do not express satisfaction". & as per World Health Organization (WHO), "The physical and chemical nature of indoor air, as delivered to the breathing zone of building occupants, which produces a complete state of mental, physical and social well-being of the occupants, and not merely the absence of disease or infirmity."

b) About >30% of the building population compliant on Heating, ventilation, & air conditioning furnishings, equipment, Tight thermal envelope. The Indoor Air and Health: Sensitivity i.e. The Reactions to indoor air pollutants depends on several factors such as age & pre-existing medical conditions. The exposure to indoor air pollutants may vary in health effects depending on the following, Type, Time and Concentration.

c) POLLUTANTS & THEIR SOURCES: Continuous Source Human Element e.g. improper maintenance, Intermittent Source and high pollutant concentrations can remain in the air for long periods after some of these activities.

15.4. SOURCES OF INDOOR AIR POLLUTION: Indoor air contaminants can originate within the building or be drawn in from outdoors. Air pollutants consist of numerous particulates, fibres, mists, bio-aerosols, and gases. It is important to control air pollutant sources, or IAQ problems can arise – even if the HVAC system is properly operating. It is broadly defined into two sources, as under:

a) CONTINUOUS SOURCE: The examples for Continuous source of Indoor air pollutants are Building materials and furnishings, Asbestos-containing insulation, Wet or damp carpet, Cabinetry or furniture made of certain pressed wood products, Central heating and cooling systems and humidification devices Outdoor sources such as radon, pesticides, and outdoor air pollution

b) INTERMITTENT SOURCE: The examples for Intermittent source of Indoor air pollutants are smoking, use of unvented or malfunctioning– stoves, furnace or space heaters, use of solvents in cleaning activities, use of paint strippers in redecorating activities, use of cleaning products and pesticides in house-keeping.

15.5. THE TOP 12 IAQ POLLUTANT SOURCES: Listed below are top 12 pollutants of IAQ:

a) Carbon Monoxide
b) Tobacco Smoke
c) Mould
d) Pests
e) Volatile Organic Compounds (VOC)
f) Lead
g) Asbestos
h) Radon
i) Particles
j) Building/Remodelling
k) Ozone
l) Chemicals & Pesticides

15.6. VOCS: VOCs are a diverse group of organic compounds that evaporate at room temperature. There are more than 100 compounds, including formaldehyde. The VOC is emitted from many sources like Construction materials, furnishings, cosmetics, cleaning agents, pesticides, and tobacco smoke. In sufficient quantities, VOCs can cause eye, nose and throat irritations, headaches, dizziness, visual disorder.

15.7. PARTICULATE MATTER: Particulate matter, also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. The size of particles is directly linked to their potential for causing health problems. Because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. The Sources of generation are Wood stove/furnaces, Un-vented kerosene, space heaters, Gas-fired range ovens, furnaces, water heaters, Vacuum Cleaning, House, Dust, and Pollen etc.

15.8. BIOLOGICAL CONTAMINATION: It is caused due to the bacteria, fungi, viruses and dust mites. Bacteria are carried by people, animals, and soil and plant debris; & dust mites are microscopic insects which flourish in damp and warm environments, poorly maintained ventilation systems can be the breeding grounds for fungi and other biological contaminants, where the premises are dusty, poorly ventilated or damp.

15.9. BASIC PRINCIPLES FOR MANAGING INDOOR AIR QUALITY:

A. INTRODUCTION: The Indoor Air quality can be managed by source control i.e. removing, substituting or modifying source, Ventilation (both general ventilation and spot ventilation), Air cleaning. “Managing” the internal environment has become a major administrative responsibility. Building Operations and Maintenance HVAC system balancing 44% of office buildings report not performing HVAC balancing Interior Pesticide Application – 39% of office buildings report interior pesticide application monthly or more than once a month

Note: For most indoor air quality problems in the premises, source control is the most effective solution.

B. ARCHITECTURAL DESIGN:

i. Where possible, rooms with significant sources of emission should be maintained under slight negative pressure, to minimize migration of the pollutants to nearby occupant which resulted in cross-contamination:
ii. Cooking-related exhaust (e.g. kitchen, canteen)
iii. Sanitary-related exhaust (e.g. toilet, bathroom)
iv. Office processes exhaust (e.g. printing room, photocopying room)

C. SELECTION OF OFFICE EQUIPMENT: The US Environmental Protection Agency (EPA) has recommended following criteria as part of a proposed preventive approach to indoor air pollution:
i. Require testing data on emissions rates from manufacturers or suppliers of office machinery;
ii. Require manufacturers to provide testing reports describing emission factors for five major VOCs emitted and for any compounds known to be toxic or irritating at concentrations of 5 mg/m3 or less;
iii. Require information on ozone emission rates for office equipment
iv. Reject office machinery that increases VOC concentrations by 500 µg/m3 or more;
v. Reject office machinery that increases ozone concentrations by more than 19.6 µg/m3 (0.01 ppmv), in occupied space.

D. BUILDING USE & LAYOUT:
i. Activities such as heavy-duty photocopying should be enclosed in areas away from densely occupied office space to reduce the impact of dust and ozone on the occupants.
ii. The partitioning of the layout might affect the effectiveness of air distribution resulting in stagnant zones in which the air quality is poor
iii. No Smoking inside the building premises and permanent signages to be installed for same
iv. Permanent signages to be installed in the designated outdoor smoking zones. These zones should be located at a minimum distance of 7.6 metres from all outdoor air intakes (entrance, doors, window openings etc.)
v. Housekeeping Chemicals used should be Green Seal (GS37) certified to prevent emissions and hazardous effects on the environment as well as user.

E. BIOLOGICAL CONTAMINANTS:
i. Dust mites and other allergy-causing agents can often be reduced through regular cleaning.
ii. Remove sources of water or moisture that encourage fungal growth and repair all external and internal leaks promptly.
iii. Keep the indoor relative humidity at less than 60% whenever possible.
iv. Install and use in kitchens and bathrooms the exhaust fans that are vented to the outdoors.
v. If possible, wash all surfaces that have been contaminated by fungi with dilute bleach (1:49).
vi. Spray humidifiers in the ventilation system can easily become contaminated with bacteria and fungi.
vii. Use efficient filters (HEPA)* to limit the fungal spores and particulates from entering the air handling system of the ventilation system.
viii. Replace the filters at regular intervals (monthly basis).

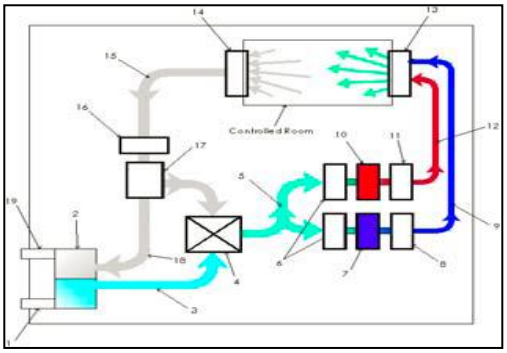
NOTE: This type of air filter can theoretically remove at least 99.97% of dust, pollen, mould, bacteria and any airborne particles with a size of 0.3 micrometres (µm) at 85 litres per minute (L/min).

15.10. HCHO & VOCS:

a) A rule of thumb is that if the finish can keep water away from the pressed- wood material, it can also reduce the escape of formaldehyde from the material.
b) Polyurethane varnish, oil-based alkyd resin paint and thick vinyl film are some of the suitable formaldehyde barrier coating materials.
c) New furniture should preferably be aired out for at least several days or weeks before they are admitted indoors.
d) Consider asking your furniture supplier or distributor to have them aired prior to delivery to your premises.
e) Emissions of formaldehyde increase as humidity and temperature increase.
f) Reducing humidity and temperature on hot and humid days will help reduce formaldehyde levels.
g) After construction is completed, the construction area should be purged by running the HVAC system at rates suitable for occupation for at least 48 hours.

h) Maintaining a higher rate of ventilation during the first few months of occupation will also help to reduce emission levels of new, renovated or newly refurbished buildings.

15.11. VOCS:



a) Maintain good ventilation for the premises at all times, with exhaust ventilation provided to potential VOC sources.
b) Read and follow closely the instruction of the manufacturers in handling paints, adhesives, cleaning agents and other VOC products.
c) Schedule redecoration work, pest control activity, etc. for unoccupied times.
d) Flush the affected area with fresh air to dilute emissions upon completion of work.

15.12. RADON:

a) Ideally, not working in earth-derived material building
b) Open your windows more often if your premise is naturally ventilated.
c) Set the fresh air intake and exhaust correctly if you have air conditioners or ventilation systems.
d) Seal any crack on the ground or walls if your accommodation is in a basement or on the ground floor.
e) Apply less permeable wall covering such as wallpaper.

15.13. AIR CLEANING:

a) Filtering particles and gaseous contaminants as air passes through ventilation equipment.
b) However, air cleaners are generally not designed to remove gaseous pollutants.

15.14. DESIGN, OPERATION AND MAINTENANCE OF HVAC SYSTEMS:

A. POLLUTANT PATHWAYS AND DRIVING FORCES:

i. Airflow patterns in buildings are determined by the combined forces of mechanical ventilation systems, human activity, and natural effects.
ii. Air pressure differences created by these forces move airborne pollutants from areas of higher pressure to areas of lower pressure through any available openings in building walls, ceilings, floors, doors, windows, and HVAC systems.
iii. Even if the opening is small, air will move until the inside pressure is equal to the outside pressure.

15.15. DESIGN OF HVAC:

An HVAC system supplies fresh air to the occupied space and exhausts or allows room air to escape thus expelling bio effluents and other air contaminants from the building. The factors which determine the adequacy and quality of the air supplied by the HVAC system are:

a) The quality of outdoor air
b) The fresh air intake
c) Air filters and cleaners
d) Sitting of ventilation equipment
e) Air distribution systems
f) Variable air volume system controls
g) Ventilation controls
h) Humid climatic conditions
i) Ventilation of pollution-emitting activities
j) Ventilation rates

k) Encourage use of eco-friendly (CFC free) refrigerants and halon-free fire suppression systems in the building to minimize negative impact on the ozone layer

15.16. HVAC DISADVANTAGE: HVAC systems can even act as sources of pollutants in some and when microbial growth results from stagnant water in drip pans or from uncontrolled moisture inside of air ducts cases, such as when ventilation air filters become contaminated with dirt and/or moisture.

15.17. THE QUALITY OF OUTSIDE AIR & FRESH AIR INTAKE: Fresh air intake should be away from exhaust outlet from the building or adjacent buildings, traffic, carparks, unloading bays, rubbish chutes, kitchens, and toilets. It should be located below ground level or close to cooling towers. It should be protected from rain entrainment and covered by a screen to prevent the entry of birds, rodents, and extraneous articles.

15.18. VENTILATION RATE (ASHRAE): Standard ventilation rates usually involve per person and a per area component. About 15 CFM (7.5 L/sec) per person ranged from the min. of 15 cfm to 20 cfm for offices and conference rooms to 60 cfm in smoking lounges.

15.19. AIR FILTERS & CLEANERS:

a) Particulate filters (various standards of measurement of filter efficiency and ASHRAE)
b) Electrostatic precipitators (>95% dust spot value)
c) High frequency electrical field (HFEF) device (snowball effect)
d) Gas filters (medium – activated carbon, silica gel)

Note: Failure to do so may result in the air cleaner either impeding the performance of the general HVAC system, or acting itself as a pollution source releasing collected contaminants from the saturated media. To prolong service life, high efficiency filter should be used in conjunction with medium efficiency pre-filter.

15.20. AIR FILTERS: Purpose of Air Filters are as under:

a) Keep HVAC components clean
b) Reduce concentration of particulates in indoor air
c) MERV (minimum efficiency reporting value)
d) Dust spot efficiency.

15.21. RECOMMENDATIONS FOR AIR FILTERS:

a) High efficiency filtration-highest possible without significant airflow reduction
b) Change filters four times a year
c) Turn off fan while replacing filters
d) Clean and wash the filter area while the fans are off
e) Ensure proper fit to prevent leaks

15.22. SIGHTING OF VENTILATION EQUIPMENT:

a) Water cooling towers of HVAC systems should be sighted so that their exhaust air is not likely to be entrained into any occupied areas, fresh air intakes and building openings.
b) Cooling towers should be provided with a water treatment system, preferably an automatic dosing system, to prevent microbial growth, corrosion and scaling.

15.23. AIR DISTRIBUTION SYSTEM:

a) Air distribution systems determine the supply air rates and fresh air delivery rates.
b) The air distribution system should be designed to facilitate measuring and rebalancing by providing access at key points (e.g. the fresh air intake, supply air duct and return air duct); or
c) By incorporating air flow monitoring stations and balancing stations.

15.24. VARIABLE AIR VOLUME:

a) Proper maintenance of controls can reduce fan energy by up to 50% and provide significant cooling and reheat energy savings.
b) Determine appropriate control sequences
c) Verify VAV box operation

d) Verify fan start/stop controls
e) Verify supply air static pressure control
f) Verify supply air temperature control

15.25. CHILLED WATER SYSTEMS:

a) Refer to manufacturers' recommendations for equipment maintenance tasks.
b) Monitor load and efficiency.

15.26. HUMID CLIMATIC CONDITIONS:

a) ASHRAE Standard 62-2001 recommends maintaining the relative humidity between 30% and 60%
b) Ensure that the supply of fresh air is always equal to or greater than the rate of air exhausted from the building to maintain a net positive or neutral average pressure relative to ambient air pressure.

15.27. VENTILATION OF POLLUTION-EMITTING ACTIVITIES:

a) Special purpose rooms, such as photographic darkrooms, kitchens & toilets should always be ventilated by local exhaust ventilation, or a combination of supply air and exhaust ventilation.
b) Local exhaust ventilation can remove a large amount of pollutant with a minimal amount of conditioned room air, thus representing high efficiency and low energy cost.

15.28. OPERATION OF HVAC:

a) It is also a good practice to switch the system on before the occupants return to an area, to minimize the effects of accumulated pollutants over unoccupied periods.
b) Occupants themselves should be shown how to operate thermostat and ventilation controls responsibly.

15.29. MAINTENANCE OF HVAC:

a) The Monthly services should be carried out on:
   i. Fresh air intakes
   ii. Air filters & Cooling coils
   iii. Water cooling towers (CT)
   iv. All trays and sumps
   v. Condensate drains and water traps
   vi. Water treatment system of CT

The Three-monthly services should be carried out on fresh air dampers

b) The Annual services should be carried out on:
   i. accessible parts of the ductwork
   ii. fans
   iii. fan coil units and terminal units
   iv. supply and return air plenum systems

DUST CLEANING:

i. Duct cleaning is a delicate process which sometimes involves the use of powerful chemicals to loosen particles (Robot with TV Monitor)
ii. Air duct cleaning can be minimized using high efficiency filters, regular maintenance of filters and other components of the MVAC system, checking air flow rates and good housekeeping.
iii. The standard specifies the maximum surface debris loading of 1 mg/100 cm^2 on nonporous system components after completion of a duct cleaning job. [US National Air Duct Cleaners Association (NADCA)]
iv. The following principles should be observed during the dust cleaning:
   - ✓ Cleaning should be scheduled outside occupied hours and carried out by experienced workers
   - ✓ The air handling unit should be switched off always
   - ✓ Negative air pressure should be maintained in the duct area, e.g. with vacuum equipment to prevent particles dispersing into the indoor air
   - ✓ Vacuum equipment should have an outdoor collection unit, or be fitted with an HEPA (high-efficiency particulate air) filter to prevent leakage of fine particulate matter into indoor air

- ✓ Duct cleaning with high (6,000 cfm or more) volume airflow should be supplemented by gentle brushing to remove loosened particles

15.30 PEST CONTROL: Pesticide spraying should be carried out outside normal working hours, and preferably during the weekends. It should be applied in targeted locations, with minimum treatment of exposed surfaces. The building manager or other person who organizes the pest control activities should have information on the chemical identities and the potential health hazards of all pesticide products used. This information is usually available from suppliers of pesticides in the form of Material Safety Data Sheets (MSDSs).

15.31 MONITORING: Measurement of IAQ parameters should be made on an 8- hour basis except otherwise specified. The operation pattern of the buildings should be considered when choosing the four timeslots. If real-time monitor is used, at least one reading should be taken every 5 minutes at each sampling point using a calibrated instrument / equipment.

15.32 TESTING: Engagement with Third party agency to perform periodic Indoor Air Quality Testing of the offices for above listed parameters and corrective actions if any.

CHAPTER 15 – LIFT/ELEVATOR SAFETY

16.1. INTRODUCTION: Though Lifts/Elevators are one of the safest forms of transportation within a facility/property between floors, following the below mentioned simple guidelines can help further improving passenger safety.

16.2. START-UP OPERATION PROCEDURE FOR LIFTS/ELEVATORS:

a) Open the Lift Cabin doors and ensure that all switches, fan, light, door & run switches are in 'OFF' position.
b) Switch 'ON' the power supply.
c) Get inside the Lift cabin & switch 'ON' the Fan & Light switches.
d) Switch 'ON' the Run/Stop switch to Run position & switch 'ON' the door switch.
e) Switch 'ON' the Auto/Inspection switch to the auto position & the IND/NOR switch to normal position and lock the service cabinet.
f) Move out of the Lift cabinet & Check the hall indicators and ascertain that they are functioning.
g) Register normal hall calls & check the operation. If found normal, the Lift may be in service.

16.3. SHUTDOWN PROCEDURE FOR LIFTS/ELEVATORS:

a) Lift should be stationed at the nearest floor after getting written permission from authorized personnel from Maintenance Dept.
b) Open the Lift cabin doors and switch 'OFF' the Fan, light, door & run switches.
c) Close the Lift cabin door & ensure that if they are locked.
d) Go to M/c room & switch 'OFF' the emergency landing device (MELD), then switch 'OFF' main power supply to the Lift.
e) Switch 'ON' the Auto/Inspection switch to the auto position & the IND/NOR switch to normal position and lock the service cabinet.
f) Put up shut down notices at appropriate locations of the Lift cabins & Lift under maintenance board should be on the main switch.

16.4. NORMAL OPERATING PROCEDURE:

a) Normally Lifts operate in Auto mode. When passenger presses button (Up or Down, as required) in the Lift Lobby, which ever lift is free and nearby will respond and reaches the destination to pick up the passenger.
b) Lifts are operated by the passengers who are using the facility to travel to various levels of the building. In some facilities/properties, Liftmen are provisioned to operate the Lifts.

16.5. DAILY CHECKS TO OPERATE THE LIFTS:

a) Check the rope condition and rope lubrication.
b) Check for Lubrication of Governor, Fly wheel
c) Open the doors and check for the condition of guide shoes.
d) Check for the smooth operation of the doors.
e) Check and remove debris from door guided in all floors & from the shaft.
f) Check the condition and lubrication of the car & Counterweight buffer springs.
g) Check the lubrication of elevator rails.
h) Check the cable end D Clamp bolts tightness and rope visually.
i) Lifts/Elevators are to be checked once in a month/ as per the OEM recommendations.

16.6. OPERATION OF LIFTS/ELEVATORS IN 'AUTO' MODE:

a) Press the CALL button in the Lift Lobby.
b) Nearest Lift responds and Lift lands in the floor.
c) Door opens with indication in the floor lobby.
d) Enter the Lift car and press the button for destination.
e) Lift door closes and moves to the destination floor.
f) Lift stops at the floor and door opens.

g) Alight from lift car before door closes automatically.
h) If door is getting closed before you alight, hold the 'door open' button to get the door open.
i) Doors will also open by sensing your image.
j) If power fails and the car get struck during the travel (instead of lift automatically reaching nearest floor and door opening), press the ALARM button in the car. Rescue team will respond and release the occupant. Do not panic, as you are safe in the lift.

16.7. NORMAL SHUTDOWN PROCEDURE: During normal shut down we must OPEN the Fire man switch in the ground floor lift lobby and put 'OFF' the lifts. This brings the lifts to ground floor level with doors kept open.

16.8. EMERGENCY RESCUE PROCEDURE FOR LIFTS/ELEVATORS:

a) Upon hearing the emergency alarm, the Maintenance/Security team on duty will respond to the emergency immediately.
b) Maintenance team will take the lift machine room key and the hoist way door key from the designated location in the electrical room and proceed to the lift machine room located on the terrace by using the staircase along with the duty technician.
c) Maintenance team to enter the machine room and switch off the main MCB controlling the affected lift in the lift main panel.
d) Maintenance/Security team on duty to call the personnel trapped inside the affected lift using the telephone available in the machine room and inform them that the rescue operation has been started and request them not to panic.
e) Maintenance team to isolate the power MCB in the affected lift control panel and lock the MCB covers after isolation.
f) Maintenance team to take the brake release device (hung in the machine control room) from the designated location.
g) Maintenance team to apply the brake release device and release the brake of the affected lift motor, after removing the motor end cover.
h) Maintenance team with the help of duty technician to manually rotate the motor and bring the affected lift to the nearest landing (either moving Up/Down depending upon the ease). Necessary markings have already been made on the rope for this purpose.
i) Maintenance team then removes the brake release device so that the brakes are applied, and the lift doesn't move further.
j) Maintenance team to go to the landing floor where the affected lift has been moved after locking the lift machine room.
k) Maintenance team reaches the affected Lift landing floor and opens the hoist way and lift doors manually using the hoist way door key.
l) All the personnel trapped in the affected lift are rescued and come out of the lift safely.
m) Maintenance team closes the hoist way and the lift doors manually and go to the lift machine room.
n) Maintenance team to put back the motor end cover in place on the affected lift motor.
o) Maintenance team to switch 'On' the MCBs located on the lift control panel and the main lift main panel located in the control room and normalize the power supply.
p) Maintenance team to place the brake release device in the designated location in the lift control room. He returns to the electrical room after locking the lift machine room.
q) Lift machine room key and the hoist way door keys are kept in the designated location in the electrical room.
r) Maintenance team files the Incident report, as per relevant procedure in respective Facility/Property.

Note: In case of such emergencies, if rescue operations are difficult, call OEM/AMC Vendor of the Lift immediately for necessary support, as they are required to reach the affected location/spot within 15 to 30 minutes, as per AMC agreement with BFS.

16.9. MANUAL RESCUE OPERATION PROCEDURE FOR LIFTS/ELEVATORS:

a) In case of Emergency OR before attempting manual rescue operation, make sure that information has been given to maintenance Dept. and complaint logged with Lift AMC/OEM Vendor.
b) Contact the passengers in the Lift cabin through intercom & assure them that they are being attended and not to panic.
c) Go to the M/c room and switch 'OFF' the "Emergency Landing Device" (MELD) & switch 'OFF' the main power supply to the Lift.
d) Fetch & fix the motor handle to the projecting end of motor shaft
e) Position the brake release lever & gently press to release the brake (care to be taken to not release this fully)
f) Check to see direction in which the Lift tends to move & keep rotating the Lift motor in the same direction.
g) Remove the motor rotating handle and the brake release lever.
h) Open any landing door with the emergency manual door operating key & check to see the floor at which the Lift is stationed.
i) Go to the floor and open the doors & release the passengers.

16.10. EMERGENCY SHUTDOWN PROCEDURE: During Fire Emergency shutdown, BREAK the glass and OPEN the Fireman switch in the ground floor lift lobby and put OFF the lifts. This brings the lifts to ground floor level with doors are kept in open condition.

CHAPTER 16– MISCELLANEOUS REQUIREMENTS

17.1 THINGS ON-SITE TEAM MUST KNOW AND UNDERSTAND:

a) Relevant SOPs/Manuals
b) Safety procedures & General safety rules.
c) Start up, shut down and maintenance systems & Procedures.
d) One's role in emergency.
e) Location and use of fire extinguishers, fire hydrants, hose boxes, fire alarm buttons, fire detectors, first aid boxes, emergency exits, electric control panels, PPE's etc.
f) Operation of emergency rescue equipment's, safety sprinklers, eye wash fountains and clean up procedures.
g) Work permit systems in the Building/ Facility / Property
h) Important telephone numbers especially fire department, emergency control centre, first aid centre etc.

17.2 WORK METHODS:

a) Ask your supervisor how to do a new task before you attempt to perform it.
b) Do not operate any machine, vehicle or equipment unless you are authorized to do so.
c) Do not tamper with guards on machineries/ equipment's.
d) Do not try to repair defective electrical wiring yourself, report it to supervisor
e) Do not leave any equipment unattended while in operation.
f) Use specific tool for the operation it is intended for.
g) Do not take short cuts.
h) Read the dials, graphs, scales accurately and known action to be taken in case of any abnormality observed.
i) Do not work under products on a hoist, crane or forklift unless the loads are adequately supported by appropriate devices.

17.3 GENERAL:

a) Read safety directions and labels before you start doing any job
b) Be familiar with the meaning of symbols and colour codes etc.
c) Do not walk through or across any operating plant unless you are authorized to do so.
d) Do not remove any sticker, notice, and tag etc., pasted at the workplace.
e) Never horseplay or distract others
f) Do not walk on the pipelines.
g) Do not drop or roll over the gas cylinders.
h) Do not use compressed air for dusting down.

17.4 DIESEL STORAGE PRECAUTIONS: These include a method for operation, maintenance of underground diesel tank & preventive check for leakage, transfer of diesel from tankers etc. to comply with legal requirements, as outlined below:

a) UNDERGROUND DIESEL TANKS & DAY TANKS: The following safety guidelines are applicable for underground diesel storage tanks:

i. Smoking is Strictly Prohibited in & around the installation. 'No Smoking' boards to be displayed in the vicinity.
ii. Source of Heat or light capable of igniting vapour shall not be allowed near the installation.
iii. Awareness through Training Programme to ensure No person ignites the matchstick or any flammable item near the installation.

iv. Only Authorized Persons allowed inside the installation. List of authorized persons shall be displayed.
v. The surrounding area shall be free of dry vegetation. The yard and enclosure shall be painted frequently to prevent rusting.
vi. Ensure all authorized persons are trained in the use of Fire Extinguishers.
vii. Adequate quantity of Fire Extinguishers & Sand buckets shall be provided.
viii. Use earthing clips for proper earthing, near diesel storage area.
ix. Transfer from Tanker to Under Ground Tank through hosepipe and under Ground Tank to Day Tank through pump. Allow hose to remain for 5 minutes before removal.
x. Maintenance & Periodic Preventive Check for Leakage: Carry out the Leak proof test.
xi. Transfer Diesel from Under Ground Tank to Tanker/Drums.
xii. Clean the Residue in Under Ground Tanker.
xiii. Collect the Residual in a Tray.
xiv. Get pressure testing done from authorized agency and take corrective action for repair.
xv. Observe for any seepage of HSD. If found call experts for inspection of the tank.

B) . WHEN UNLOADING HSD FROM TANKER:

i. Before entering HSD Yard, switch off mobile phone.
ii. Check that tankers seal is not tampered and diesel not contaminated, if it is so then immediately informed to supplier and Client about the same and do not unload the tanker.
iii. Ensure that diesel tanker is in level with ground and stable before taking reading from dip stick.
iv. Check all the three chambers of tanker with dipstick and note down the reading.
v. Ensure actual quantity is same as mentioned in delivery Challan/ Invoice, if lesser please intimate to Property Manager and do not unload tanker.
vi. Ground the tanker with earth jumper before attaching the unloading hose.
vii. Note down the opening reading of HSD storage tank by dip stick before fixing the hose with tanker.
viii. Note Down the closing reading after the tanker is fully unloaded.

C) WHEN FILLING THE DG DAY TANK:

i. Ensure that two people are available while filling the day tanks; one person will work as a Controller and other as an Informer.
ii. Check that all other day tanks valves are closed other than the Day tank is being filled.
iii. Controller will operate the feed pump 1 or 2 (one should always be off) and Informer will check the feed line and feed pumps for leakage immediate after running feed pump.
iv. In case Informer observed any leakage from feed lines or pump, Informer will immediately inform to Controller for switching off the feed pump.
v. After ensuring that there is no leakage Informer will rush to respective Day tank which is being filled and monitor the Day tank level.
vi. In case of feeding to 320 KVA DG's day tank, diesel will be taken through Buffer tank and after filling the day tanks buffer tank level will also be maintained.
vii. Informer will intimate to Controller as Day tank level reaches 90% and Controller will immediately switch off the feed pump.
viii. Once feed pump is off Informer will close all valves of feed lines and ensure that there is no spillage.
ix. Diesel feed pump should be restricted to unauthorized and ensure warning is displayed on feed control panel.

17.5 SPILL MANAGEMENT: Liquid waste spills that are not appropriately managed have the potential to harm the environment. BFS Site Leads at IFM and Asset Management sites needs to take certain action to ensure that the likelihood of spills occurring is reduced and that the effect of spills is minimized, outlined as under:

a) MINOR SPILL MANAGEMENT: A small spill is a spill of 5 litres or less providing the product is not concentrated. For concentrated products of any quantity the spill must be treated as a large spill:
i. Assess safety. Make sure that people are kept clear, and that you have the right training and equipment to deal with the spill.

ii. Stop the source. Providing it is safe to do so, stop the spill at its source. This may involve righting an overturned container or sealing holes or cracks in containers.
iii. Contain and clean up the spill. The spill should be mopped up immediately.
iv. Record the spill. Record when, what, how and where the spill occurred, clean up measures undertaken and the names of any witnesses. Also make note of what changes can be made when handling, transporting or storing chemicals to ensure a similar incident does not happen again.

b) MAJOR SPILL MANAGEMENT: A large spill is anything over 5 litres or concentrated chemicals of any volume.
i. Assess safety: Make sure that people are kept clear, and that you have the right training and equipment to deal with the spill. Ensure the correct SPILL-KIT is available for use.
ii. Consult the Material Safety Data Sheet (MSDS). The MSDS will have instructions on how to deal with specific chemical spills.
iii. Put on protective clothing: If necessary, put on gloves and goggles, a mask and an apron.
iv. Stop the source: Providing it is safe to do so, stop the spill at its source. This may involve righting an overturned container or sealing holes or cracks in containers.
v. Contain and control the flow: The spill should be prevented from filtrating into the ground or entering the storm-water system. The outer edge of the spill should be dammed with rags, blankets, sand, sands bags, mops and/or absorbent booms.
vi. Clean up the spill: Promptly cover the spill using absorbent materials such as the correct absorbent granules for the product (Note that some strong acids will react with some types of granules and sawdust), sand and rags, being mindful not to splash the spill. Using a dustpan or spade, the absorbent granules or sand must then be scooped up and placed into a container. This waste material is not to be buried or thrown into the environment. The method of disposing this waste will depend on the amount and the type of chemical that was spilt.
vii. Report the incident as per BFS Group Incident & Investigation SOP, following the correct incident escalation procedure.
viii. Notify the appropriate authority. If the spill does enter a stormwater drain or open ground, your local municipality, SPCB/PCC and Water Board must be notified.

c) SPILL KIT: It is vitally important that an appropriate Spill-Kit is sited near the source of any potential hazardous spill. It is also imperative that the spill kit is clearly labelled and located in an easily accessible position for all staff. Ensure that all staff is aware of and can access the Spill Management Plan and know how to use the spill kit in case of an emergency. There are varying spill-kit requirements for the different types of likely spill, which could be fuel, oil, cooking oil, coolant, paint, chemical or pesticide. While procuring a spill kit for your site, ensure that the correct specification is taken into consideration.

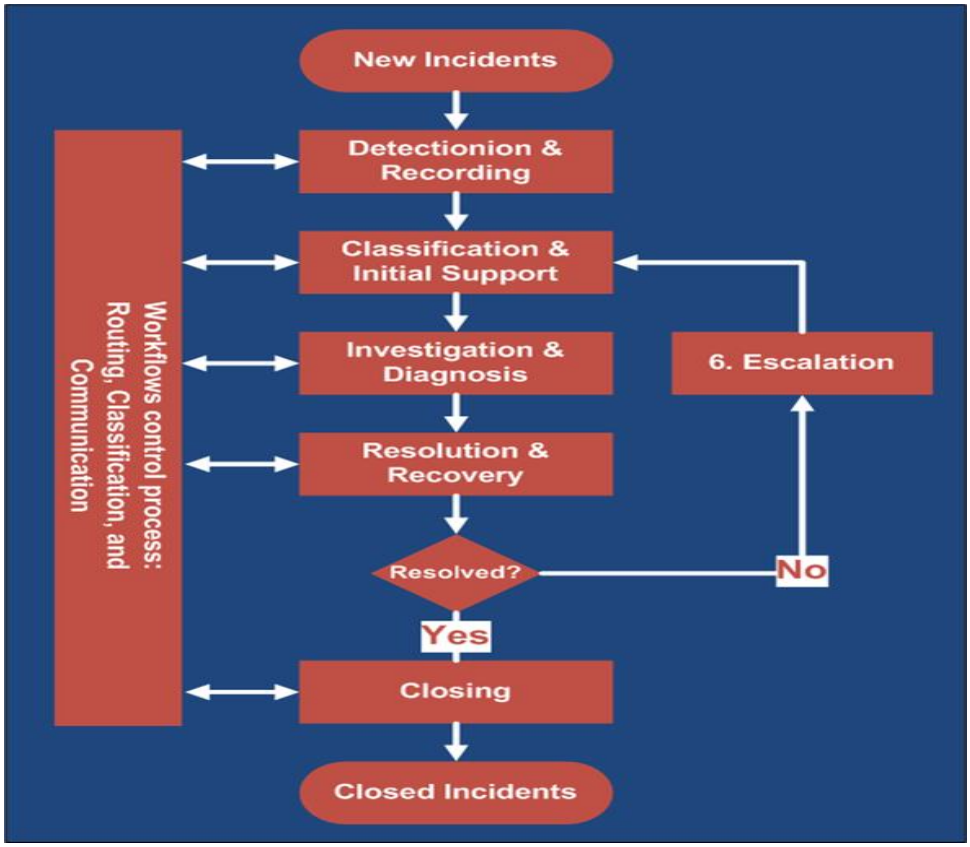
CHAPTER 17 – INCIDENTS REPORTING & INVESTIGATION

18.1 The failure of people, equipment, supplies or service deliverables to behave or react as expected causes most incidents. Incident means any unplanned event or failure of service deliverable that causes or has the potential to cause, any injury or illness to employees, and/or damage to equipment, Facility/property or service deliverables etc. Incident investigation determines how and why these failures occur. Investigation activities are directed towards defining the facts and circumstances relating to the event, determining the causes and developing remedial action to control the risks.

18.2 BFS Standard Operating Procedure for Incident Management reporting at sites promulgated has outlined the steps & procedure for categorization of Incidents including severity, reporting and closure with RCA, Lessons Learnt and Remedial measures to obviate recurrence. Incidents (including EHS aspects) at sites include fatalities or personal injuries (employee or service partners), occupational disease, facility/property damage including damage to equipment/machine, environmental loss, failure of service deliverables or production/business loss and near misses or for reasons beyond our control like Earth Quake, Riots, Floods and Terrorist/Enemy attacks or Bomb Blasts etc.

This incident/accident reporting and investigation procedure applies to any incident/accident occurring wherever organization is conducting business or involves personnel or contractors under organization control or influence

Flow chart for Incident / accident reporting



Reporting, Recording and Notification of Incidents / Accidents

Accident or incident occurs

- Whenever any OH&S incident or accident occurs, personnel operating near the area (preferably trained, skilled & competent to deal with incident / accident) shall take necessary & immediate steps to control the hazard to prevent further incidents/injury and seek immediate medical assistance (First aid or hospitalization), in accordance with actual situation.
- Concerned personnel (employee or interested party) shall notify to Facility manager (FM) & Property manager (PM)of respective site as soon as possible after the event has occurred / noticed. (Note: visitors and contractors shall be made aware, about whom to contact if an accident or incident occurs during the induction process. This can be ensured through display of contact details of key personnel to be notified in case of such situation).
- Facility manager shall confirm that whatever reasonably practicable steps are necessary to control the hazard to prevent further incidents/injury have been taken and then report to appropriate authority to allow appropriate statutory reporting and to enable early intervention
- Secure incident site
- Where appropriate, Facility manager (FM) or Property manager (PM) of respective site as well as personnel available at site at the time of incident / accident, shall secure the scene of an accident or incident to ensure accurate information can be obtained for investigation purposes
- For immediately notifiable work-related injuries or dangerous occurrences, Facility manager (FM) or Property manager (PM) of respective site as well as personnel available at site shall ensure that:

a) The site where the injury occurred has been altered

b) Plant or equipment connected with the incident has not been reused, repaired or removed

c) Substances connected with the incident have not been reused or removed.

- Facility manager (FM) or Property manager (PM) of respective site as well as personnel available at site must, pending the granting of permission by an inspector, take such steps as are necessary:

a) To rescue an injured person; or

b) To protect the health or safety of any person who may be near the site, and may prevent undue damage to property

- All accidents and incidents shall be recorded in Incident & Accident investigation report by the person who was involved in the accident or incident, as soon as possible after it has occurred, or at least within 24 hours of it occurring.
- When it is not possible for a person to complete a form (e.g. the person has been taken to hospital or is not at work), Facility manager or Security personnel available at site shall complete the form.

Incident investigation

- Facility manager (FMS) or Project manager (PMS) of respective site as well as personnel available at site or EHS Head (where practically feasible), shall investigate the incident / accident, in consultation with the EHS Head and personnel who were involved in the incident (where possible)
- Investigation should commence as soon as possible or at least within 24 hours of receiving notice of the incident / accident. Depending upon the complexity and nature of the incident / accident, the investigation may involve other employees or stakeholders and may require external expertise.
- The focus of the investigation is to obtain an accurate picture of what occurred by:

a) Examining the scene of the accident or incident and recording (as relevant) any physical evidence related to the event such as, but not limited to:

- The location of the person at the time of the event
- Any problem associated with the use of any plant, equipment, or substances
- Workplace conditions such as lighting, floor surface, warning signs, weather conditions (if the event occurred outside)

b) Interviewing persons involved and witnesses

c) Reviewing background information including, but not limited to:

- Documented procedures, SOPS or work instructions for the work being carried out and if there were any deviations from such
- Maintenance and testing reports, if plant or equipment involved
- Training and competency
- Any similar events that have occurred previously
- Investigation findings shall be recorded in Incident & Accident investigation report Form.

Undertake a risk assessment

- Facility or Property manager & EHS Head shall conduct a risk assessment (HIRA) or review the risk assessment if one already exists, to determine the likelihood of the accident or incident re-occurring, the potential consequences if the accident or incident did re-occur and identify the level of risk using the risk matrix table (HIRA register)

Identify and implement corrective or preventative actions

- Facility or Property manager & EHS Head, the personnel who were involved in the accident or incident and where relevant, other stakeholders; shall identify the corrective or preventative actions required to prevent an occurrence / recurrence of the event. Controls shall be selected in descending order from the Hierarchy of Controls in accordance with the HIRA procedure.
- The findings shall demonstrate that any risks to health and safety are eliminated, or where that is not reasonably practicable, minimized and priorities for action shall be set in accordance with the HIRA Risk matrix.
- Depending on the outcomes of the risk assessment and investigation, both short and long-term control measures may be required.
- Incident & Accident investigation report Form shall be completed.
- Facility or Property manager & EHS Head shall ensure that the investigation findings are logged in Incident & Accident investigation report
- Monitor and review actions for effectiveness
- Facility or Property manager & EHS Head shall:

a) Discuss, monitor and evaluate controls for effectiveness in consultation with work group employees and another stakeholder

b) Recommence the risk assessment process if new hazards are identified.

c) Include a review of any controls implemented into workplace inspections, as relevant.

d) Communicate the outcomes of the accident and incident investigation process to the safety Committee (where relevant) as required

e) Close out the Incident & Accident investigation report Form when actions have been reviewed for effectiveness

- Safety committee (where relevant) shall monitor the accident and incident statistics during its meetings. A report shall be presented to the Senior Management Team listing outstanding items requiring their direction or enforcement.
- Safety Committee shall review accident and incident statistics and direct action when required. Minutes shall record outcomes of discussion and actions undertaken.
- Incident / accident reporting and investigation shall be subject to internal audit and the audit findings shall be reported as part of the on-going management review process

CHAPTER 18 – ENERGY MANAGEMENT

19.1. EQUIPMENT HEALTH, SAFETY AND ENERGY SAVING METHOD:

A) ENERGY SAVING IN LIGHTING LOAD:

i. Turn off nonessential and decorative lighting, especially in unoccupied areas, provide 24hr. time switch & programme it accordingly.
ii. Switching off the non-essential area lights during the daytime.
iii. Colour code or mark light switches and circuit breakers that can be turned off when not needed.
iv. Lower the height or perfect placement of light fixtures to increase usable light
v. Convert decorative halogen lamps into LED.
vi. Replace conventional ballast with Energy efficient electronic Ballast.
vii. Replace 40w fluorescent T/ L with T- 5 or T- 8 lamps for more energy saving, high intensity light and longer life. This reduces the maintenance cost as well.
viii. Turn off main light switches for unoccupied areas to reduce line losses and for safety measures.
ix. Replacement of MLL and HPMV lamps with Energy Efficient Metal Halide Lamps.
x. Check temperature setting of water heater for Canteen and water geysers.
xi. Ensure for tight connection in electrical system.
xii. Provide On delay motion sensors for workstations and rest rooms. Use sunlight during daytime.

B) ENERGY SAVING IN HVAC SYSTEM:

i. Set thermostats at 25 degrees Celsius (in consultation with respective Client) for cooling to save 10-15% of cooling costs.
ii. Follow proper operation schedule for AHU's.
iii. In summer season, draw the curtains/ blinds and shade to reduce the heat load.
iv. Ensure regular maintenance of HVAC and Electrical Systems as per PPM schedule.
v. Ensure installation of VFDs to all Chilled water pumps.
vi. Ensure that all AHU's are fitted with VFDs.
vii. Carry out Chemical treatment for Chilled water system and AHU's (internally) to increase heat transfer rate.
viii. Ensure that a closed loop is maintained for proper efficiency of cooling system.

C) SAVING IN CENTRALIZED AIR CONDITIONING UNITS:

i. An automatic-delay fan switch to turn off the fan a few minutes after the compressor turns off.
ii. Places the condensing unit in a shady spot, if possible, which can reduce your air conditioning costs by 1%–2%.
iii. Locates the thermostat away from heat sources, such as windows or supply registers.
iv. Check and maintain Surface Heat Loss from Refrigerant pipes after providing insulation
v. Provide a fan-only switch, so you can use the unit for nighttime ventilation to substantially reduce air-conditioning costs

D) ENERGY SAVING IN UPS SYSTEM:

i. Turn off PCs, monitors, printers, copiers, and lights every night and when not being used even while going for Lunch.
ii. Use ink jet printers when possible – they consume 90% less energy than laser printer
iii. Plan for Laptops instead of Desktops to reduce backup supply requirement, capital and running cost.

E) GENERAL:

i. Rate negotiation with various vendors and fixing a rate contract with them.
ii. Negotiate and reduce the AMC cost without affecting the equipment or system efficiency.
iii. Avoid paper wastage (Recycle or Reuse).
iv. Switch off Tea / Coffee vending machine when not in use especially in night.
v. Use personal water bottles while drinking water, save cost of disposable glasses.

vi. Avoid wastage of toilet paper / tissues.
vii. Track and reduce personal telephone calls from office lines.
viii. Proper Planning of shift schedule as per sitting arrangements for optimum utilization of air-cooling system.

19.2. RECOMMENDED VALUES OF ILLUMINATION AND LIMITING VALUES OF GLARE INDEX:

SR. NO	INDUSTRIAL BUILDINGS AND PROCESSES	LUX LEVEL	LIMITING GLARE INDEX
1	**General Facility Areas**		
	a) Canteens	150	
	b) Cloakrooms	100	
	c) Entrances, corridors, stairs	100	
II	**Outdoor Areas**		
	Stockyards, Main Entrances, Exit roads and Car parks	20	
	a) Rough work, e.g. frame assembly, Assembly of heavy machines	150	28
	b) Medium work. E.g. machined parts, engine assembly, vehicle body assembly	300	25
	c) Fine work, e.g. Radio and telephone equipment, typewriter and office machinery	700	22
	d) Very fine work, e.g. assembly of very small precision mechanisms, instruments	1500	19
III	**Laboratories and Test rooms**		
	a) General Laboratories, balance rooms	300	19
	b) Electrical and instrument lab	450	19
IV	**Welding and Soldering**		
	a) Gas and arc welding, rough spot welding	150	28
	b) Medium soldering, brazing and spot welding, e.g. domestic hardware	300	25
	c) Fine soldering and spot welding, e.g. instruments, radio set assembly	700	22
V	**Libraries**		
	a) Shelves (Stacks)	70 – 150	
	b) Reading rooms (newspapers and magazines)	150 –300	19
	c) Reading Tables	300 -700	22
	d) Cataloguing, sorting, stock rooms	150 –300	19
VI	**Offices**		
	a) Entrance halls and reception areas	150	
	b) Conference rooms, Executive offices	300	19

19.3. GREEN PRACTICES IN FACILITY/ PROPERTY:

a) Review and understand BFS policies and Procedures.
b) Determine to what extent the policies can be implemented within your portfolio, buildings or facility/property.
c) Discuss pertinent policy issues with the appropriate service suppliers/vendors.
d) Determine if there are any major impacts to the current building operations or additional costs associated with the implementation of the policies.
e) Develop written implementation plans along with the policies and discuss them with building ownership (i.e. cost impact, changes in operation, notification to occupants).
f) Obtain approval in writing.
g) In the event that a facility/property is unable to implement the policies or parts of the policies, supporting documentation outlining the reasons for non-compliance should be maintained on file.

CHAPTER 19 – EHS REVIEWS

20.1 PURPOSE: The Objective of conducting IFM/ Asset Management review, scope of review, selection of Assignments to be reviewed and their basis, review Methodology and generating review report along with any NCRs, if applicable.

20.2 APPLICABILITY & SCOPE: It is applicable to all the internal reviews to be conducted by BFS or outsourced Operations & review team, including annual EHS, at IFM/ Asset Management sites.

20.3 EHS REVIEWS: To ascertain environment, safety and health related issues at IFM and Asset Management sites managed by BFS, EHS review will be conducted by BFS or outsourced EHS resources once a year. EHS resource will also check whether the team is meeting EHS specific SLAs, service quality, safety & satisfaction specific to EHS aspects. This EHS review will be conducted in accordance with standard review checklist and Quarterly Self-assessment checklist for compliance by site leads is placed at Annexure 10 this Manual.

CHAPTER 20 – ASSOCIATED FORMATS, CHECKLISTS & TEMPLATES

21.1. Following Checklists, Templates and Formats are attached as annexure, as noted against each, to this manual to assist BFS Group Site Lead/ IFM and Asset Management to evolve site specific formats and implementation:

Annexure -1	Hot Work Checklist	 Annexure-1 Hot Work Checklist
Annexure -2	Confined Space Checklist	 Annexure-2 Confined Space Ent
Annexure -3	Confined Space Work Permit Template	 Annexure- 3 Confined Space Wo
Annexure -4	IFM/ Assets Management Workplace EHS Checklist	 Annexure-4 FM & PM Checklist
Annexure -5	Contractor's Work Permit Template for Hot Work	 Annexure 5 Contractor's Work P
Annexure -6	Contractor's Work Permit Template for Routine Work	 Annexure-6 Contractor's Work P
Annexure -7	Contractor's General Work Permit Template	 Annexure-7 Contractor's Genera
Annexure -8	Contractor's High-Risk Work Permit Template	 Annexure-8 Contractor's High Ri
Annexure -9	Vendor's Kitchen Hygiene & Audit Checklist	 Annexure-9-Vendor 's Kitchen Hygiene &
Annexure -10	Quarterly IFM/ Assets Management Site EHS Self	 Annexure-10 Quarterly FMPM Site
Annexure -11	EHS DO's & DON'Ts Checklist	 Annexure 11 EHS DO's & DON'Ts Che

Annexure -12	Standard Signage’s	Annexure-12 List of Signage

REFERENCES:

(1) IS 15183 (Part 2): 2002 Guidelines for maintenance management of buildings: Part 2 Finance

(2) IS 15183 (Part 3): 2002 Guidelines for maintenance management of buildings: Part 3 Labour

(3) IS 11208: 1985 Guidelines for registration of plumbers

(4) IS 13182: 1991 Waterproofing and damp proofing of wet areas in building — Recommendations

(5) IS 2064: 1993 Code of practice for selection, installation and maintenance of sanitary appliances (second revision)

6) IS 2190: 2010 Selection, installation and maintenance of first-aid fire extinguishers — Code of practice (fourth revision)

(7) IS 2189: 2008 Selection, installation and maintenance of automatic fire detection and alarm system — Code of practice (fourth revision)

(8) IS 15301: 2003 Installation and maintenance of firefighting pumps — Code of practice

(9) IS 13039: 2014 External hydrant systems — Provision and maintenance — Code of practice (first revision)

(10) IS 3844: 1989 Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises (first revision)

(11) IS 15105: 2002 Design and installation of fixed automatic sprinkler fire extinguishing systems — Code of practice

(12) NFPA Standard 10, Table 5.2.1

(13) Solid Waste Management Rules, 2016, Ministry of Environment, Forest and Climate Change, Govt. of India

(14) Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Ministry of Environment, Forest and Climate Change, Govt. of India

END OF DOCUMENT