HINDUSTAN PETROLEUM CORPORATION LIMITED

INTEGRATED SYSTEM OF PROCEDURES-PIPELINES

FIRE AND SAFETY

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PREFACE

Security and Safety are vital aspects to an organization's growth. Environment impact of the Operations of an Organization is even more significant with stringent statutory regulations in place. Any lacuna on these critical elements is never a pleasing site. Such is the emphasis given to Health, Safety and Environment that industries are willing to adapt newer technologies, robust infrastructure and security set ups so as to enhance plant safety. When it comes to safety in the 'Oil and gas Industry' the companies leave no stone unturned in ensuring that all the operations and maintenance activities inside and outside the premises are safe and in compliance with the best industry practices.

Oil and Gas Industries are governed by the best of codes and standards like OISD, PNGRB, ASME, API etc. The entire sector strictly complies with the guidelines in these standards which in itself are comprehensive, covering each and every element of the critical functions which are carried out in the oil and gas sector. In addition, the industry is never shy of investing in the best of practices be it operations or maintenance. The key focus being security of its assets and safety of the equipment's, machinery and most importantly its manpower and environment. Automated systems, CCTV cameras, DFMD's (Door Frame Metal Detectors), HHMD's (Hand Held Metal Detectors), Glass Vehicle Mirrors, interlocks in the system for better control, PLC based operations facilitating 3 types of control viz Remote, Local & Manual, the HVLR's, Sprinkler system, Foam system, Fire Water network etc., the industry is doing all things possible trying to in maintaining incident free operations. Regular audits of all kinds by various teams and different frequency are scheduled to keep a check on the upkeep of all the systems in place.

HPCL too in an endeavor to stay afloat with the prevailing practices has always been a pioneer in the implementation and use of fresh technologies, innovations and tools so as to make the operations of each and every SBU smooth and safe. Since we are into marketing of petroleum products the major challenge is to reach the end users at a distant places across the country with the supply of the products so as to meet the consumer needs. The two basic needs for a common man being the use of LPG for cooking purpose and Petrol/Diesel/SKO for transportation from one place to another.

HPCL through its Projects & Pipelines SBU meets this requirement in line with the corporation's objective. With a total pipeline network of around 3731 KM's and growing, the Pipelines SBU is rapidly expanding with new projects and pipelines being laid to meet the growing customer demands. These pipelines extending from one place to another carry petroleum product in faster, cheaper, environment friendly and most importantly in bulk quantities to cross country locations. With such a huge network of pipelines, there arises a need for strong infrastructure set up in order to protect the pipelines & its facilities from incidents, pilferage attempts, sabotage and encroachments on the pipelines etc. so that there is nil damage to the environment and highest possible levels of safety are maintained at all times.

Projects & Pipelines SBU has always kept pace with the industry practices in adapting safe practices. New equipment and technology are in place to ascertain that safety is paramount. Personal Protective Equipment (PPE's), Fire Fighting Equipment (FFE's), Trainings as per the industry standards and practices are under implementation across locations and Pipeline ROU to ensure incident free locations and operations.

This document provides an insight into the various activities on Fire & Safety (FAS), inspection ways, techniques, maintenance procedures of PPE's, FFE's, Trainings, Incident reporting, ERDMP etc. The procedures mentioned are indicative of the methods to carry out and handle responsibilities related to FAS. Actual implementation may vary from location to location and as per site requirement.

This document contains the standardized SOP for the department. The content mentioned are generic and applicable to each of the locations. The SOP has been made keeping in mind the Operations and Maintenance procedures in practice at all the locations. Any change in the SOP arising out of any location specific requirement and / or methods / equipment needs to be appropriately incorporated in the location with due approval as per IMS Procedures.

SOPs SBU level / location specific

SOP for FAS is applicable to the entire SBU. All the Officers of each location are responsible for ensuring safe practices at the location target ‘ZERO’ incidents. Prime responsibility of handling FAS related activities, conducting trainings, meetings, various awareness programmes etc. lies with the FAS Officer and / or Station-In-Charge.

Certain equipment at locations may vary as per requirement and there would be location specific SOP’s in regard to the same. For instance, ERV vehicle is present with product pipelines and hot flare is available with LOG pipelines.

Revision and Amendment sheet

Page No.	Clause No.	Revision No.	Revision Date	Amendment Details

Note: - As per the procedure for control of document procedure can be revised up to maximum 10 revisions and after 10^{th} revision, new issue of the document with new issue number shall be issued to all the controlled copy -holders.

1.0 DCP FIRE EXTINGUISHERS:

1.1 PURPOSE:

To provide guidelines for maintenance/Inspection of Fire DCP Extinguishers.

1.2 SCOPE:

Scope of work includes maintenance and Inspection of Fire DCP Extinguishers.

1.3 RESPONSIBILITY:

Officer In-Charge-FAS.

1.4 REFERENCE:

IS 2190: 1992
OISD 142

1.5 **PRECAUTIONS:** 1. PPEs to be worn while carrying out the operation-1. Safety Shoes 2. Safety Helmet 3. Face Mask while handing DCP.

1.6 **SPECIAL TOOLS/EQUIPMENT:** NIL

1.7 **PREREQUISITES-** The operating/service personnel should be well-versed with the Operation and Maintenance Procedures.

1.8 **PROCEDURE STEPS:**

1.8.1 METHOD OF OPERATION:

1.8.1.1 Carry the extinguisher to the place of fire (check the the wind direction).
1.8.1.2 Remove the safety clip at the lever/handle
1.8.1.3 Press the lever to actuate piercing mechanism, which in turn breaks the sealing disc of the CO_2 cartridge. For 9kg stored pressure type fire extinguisher, press the handle to release the powder.
1.8.1.4 Direct the stream of powder at the base of the flame. Progress forward, moving the nozzle rapidly with a side to side sweeping motion.
1.8.1.5 For effective results stand 5-8 feet away and operate the extinguisher from the windward side of the fire.
1.8.1.6 Empty Fire Extinguisher to be placed horizontally on the ground.

1.8.1.7 Replace the used Fire Extinguisher with a spare one immediately.

1.8.1.8 For 75 Kg DCP Fire Extinguishers two persons should be available for operation as follows:

1. Take the Fire Extinguisher to the scene fire. Maintain a safe distance of 5-8 feet as per OISD 142.
2. Person1-Unroll the discharge hose and press the nozzle directed towards the base of fire and signal Person2 to release Co2 gas from the cartridge.
3. Person2-Release Co2 gas gradually.
4. Take the Fire Extinguisher to the warehouse and replace it with a spare one.

1.8.2 **MONTHLY INSPECTION AND MAINTENANCE:**

1.8.2.1 Take work permit.

1.8.2.2 Use applicable PPE as per the matrix.

1.8.2.3 Check

1.8.2.3.1 Designated location and ensure accessibility of extinguisher.

1.8.2.3.2 Seal for any sign of usage and/or accidental discharge

1.8.2.3.3 Physical appearance for dents / scratches / corrosion pitting signs and condition of paint.

1.8.2.3.4 Any residual pressure in nozzle assembly

1.8.2.3.5 Cap washer intactness, plunger is clean

1.8.2.3.6 Signs of caking of DC Powder

1.8.2.3.7 The filled height of the DC Powder till the punch marked position. If found less refill the same to the required height

1.8.3 Clean the exterior of the extinguisher and polish the painted portion.

1.8.4 Unscrew the cap assembly slowly for two or three turn only to allow any residual pressure to escape via the vent holes. Do not unscrew it further until all pressure is released.

1.8.5 If pressure is not being released after unscrewing the cap two to three turns then do not unscrew it further without taking appropriate safety measures: Sudden release of pressure may eject parts, cap assembly or contents of the extinguishers. Use suitable clamping arrangements and appropriate personal protective equipment.

1.8.6 Attempting to remove parts from extinguishers at the time of inspection / maintenance, enough care should be taken by the concerned person, to avoid sudden ejection of any part causing injury.

1.8.7 Remove the gas cartridge and see that seating disc is intact, measure the weight of the cartridge by using weighing machine and compare its mass with full mass cartridge marked on it. In case, loss of mass is more than 10%, it should be replaced by new cartridge.

1.8.8 Remove inner container, port holes to be cleaned and replace the PVC seal. Ensure no DC powder in the container.

1.8.9 Enter the inspection date on the tag provided for the extinguisher and enter the next due date of inspection.

1.8.10 Record the details of replacement of parts also in history card.

1.8.11 HYDRAULIC PRESSURE TESTING:

1.8.11.1 1/3rd of total DCP Fire extinguishers have to be Hydro tested at 35 kg/sq.cm. as per IS 2190 every year (the test pressure shall be held for a minimum period of two and a half minutes) and records have to be entered in History Card so as to ensure all the Fire Extinguishers are tested once every three years.

1.8.11.2 Hydrostatic test of the cylinder shell along with cap and hose assembly shall be done at 30 kg/sq.cm once every three years as per OISD 142.

1.8.11.3 There shall not be any leakage or visible distortion. Extinguisher that fails in this requirement shall be rejected.

1.8.11.4 The internal coating and external painting shall be checked for damage/deterioration Once in three months. The coating thickness shall be checked once every three years.

1.8.11.5 Ultrasonic thickness inspection of shell shall be carried out during each hydrotest.

Note: Existing 10 KG DCP Fire Extinguishers to be replaced with 9 KG DCP Fire Extinguishers as and when due for replacement (Maximum 10 years from the date of commissioning).

A Hydrostatic test of the cylinder shell along with cap and hose assembly shall be done at 30kg/sq.cm for a duration of 60 seconds once every three years as per OISD 142 clause 5.1.1 (iii)(c)

1.9 SAFETY CAUTION/SAFETY NOTE - 1. If an extinguisher is removed from its designated place for operation/inspection it should be put back in its place if it has not been used up and replaced with another one if it is used up. The Fire Extinguisher which has been used should be kept in a horizontal position to indicate that it is empty.

1.10 RECORDS/FORMAT

Maintenance of DCP Extinguisher: ISF/FAS/01

1.11 FREQUENCY OF RECORDS: Monthly

2.0 CO_2 FIRE EXTINGUISHERS:

2.1 PURPOSE:

To provide guidelines for maintenance of CO_2 Extinguishers

2.2 SCOPE:

Scope of work includes maintenance of CO_2 Extinguishers

2.3 RESPONSIBILITY:

Officer In-Charge-FAS

2.4 **REFERENCE:**
IS 2190: 1992 SELECTION, INSTALLATION AND MAINTENANCE OF FIRST-AID FIRE EXTINGUISHERS — CODE OF PRACTICE.
OISD 142

2.5 **PRECAUTIONS:** 1. PPEs to be worn while carrying out the operation-1. Safety Shoes
2. Safety Helmet

2.6 SPECIAL TOOLS/EQUIPMENT:-NIL

2.7 **PREREQUISITES-** The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

2.8 **PROCEDURE STEPS:**

2.8.1 METHOD OF OPERATION

2.8.1.1 Carry the extinguisher to the place of fire.
2.8.1.2 Remove the safety clip and open the valve assembly.
2.8.1.3 Direct the CO2 gas jet at the base of the fire, starting at one edge and sweeping across the surface of the burning material.
2.8.1.4 Empty Fire Extinguisher to be placed horizontally on the ground.
2.8.1.5 Replace the used Fire Extinguisher with a spare one immediately.

2.8.2 MONTHLY MAINTENANCE & CHECKS:

2.8.2.1 Take work permit.
2.8.2.2 Use applicable PPE as per the matrix.

2.8.2.3 Check

2.8.2.3.1 Designated location and ensure accessibility of extinguisher. Seal and safety pin.

2.8.2.3.2 Physical appearance, examine extinguisher body externally for body damage or corrosion

2.8.2.3.3 The weight of extinguisher by using weighing machine and compare mass against the mass marked on it for fully charged extinguisher. It should be sent for refilling if the loss is more than 10% of mass; Clean and polish externally

2.8.2.3.4 Discharge hose for signs of deterioration or cracks and hose clamps for corrosion.

2.8.2.3.5 Discharge horn and handle for usability and the hose nozzle for its tightness.

2.8.2.3.6 The carrying handle of trolley and trolley wheels if any, for free movement. Clean and oil the wheel carriage if required.

2.8.3 HYDRAULIC PRESSURE TESTING:

2.8.3.1 Every CO2 extinguisher installed in the premises shall be hydraulically pressure tested before every refilling or once in five years at a pressure of 250 Kg/cm2 (the test pressure shall be held for a minimum period of two and a half minutes) as per IS 2190 and proper records to be maintained in the History card.

2.8.3.2 During the pressure testing, there shall not be any leakage or visible distortion. Extinguisher that fails in this requirement shall be rejected and condemned

2.8.3.3 Fire extinguishers to be hydrotested and refilled by the PESO approved vendor using test bench & calibrated pressure gauge.

2.8.3.4 Ultrasonic thickness inspection of shell shall be carried out during each hydrotest.

2.9 **SAFETY CAUTION/SAFETY NOTE:-** If an extinguisher is removed from its designated place for operation/inspection it should be put back in its place if it has not been used up and replaced with another one if it is used up.

2.10 **RELEVANT RECORDS:**

Maintenance of CO_2 Extinguisher**:** ISF/FAS/02

2.11 **FREQUENCY OF RECORDS:**

Monthly

3.1 **PURPOSE:**

To provide guidelines for maintenance of Fire Hydrants/Block Valves.

3.2 **SCOPE:**

Scope of work includes maintenance of Fire Hydrants/Block Valves.

3.3 **RESPONSIBILITY:**

Officer In-Charge-FAS

3.4 **REFERENCE:**

OISD-STD-117

3.5 **PRECAUTIONS: 1**. Ensure that the Fire Engines are kept in manual mode so that they don't get started accidentally during maintenance of the hydrant valves.

3.6 **SPECIAL TOOLS/EQUIPMENT:** 1. Adjustable wrench

3.7 **PREREQUISITES-**The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

3.8 **PROCEDURE STEPS**
MAINTENANCE OF FIRE HYDRANTS/BLOCK VALVES:

3.8.1 **Testing of block valves on Fire – Water lines**:

1. Select a loop in fire water system and lubricate the stems of the block valves within the loop.
2. Ensure easy operation by opening and closing.
3. Isolate the loop by closing all entries to loop.
4. Open hydrant on isolated loop and ensure no flow.
5. Open one side (entry in loop), take pressure reading on nearest Hydrant to opened block valve.
6. Shut this block valve and open another entry.

7. Note pressure reading and compare to know whether block valve is passing at drop seat. Block valve to be repaired.

3.8.2 **Monthly Hydrant Servicing**

1. Take work permit
2. Use applicable PPE as per matrix
3. ensure accessibility of hydrant
4. Check
   4.1. Visually the exterior of fire water line for signs of corrosion, pinholes or bad painting etc.
   4.2. Facing of all flanges of hydrant outlet for cleanliness and correct fitting to male / female couplings. Clean the outlets by sand paper if necessary.
   4.3. The condition of gland packing / bushing / valves on hydrant and monitor.
   4.4. Stem of the hydrant point is properly painted and /or properly coating wrapped.

5. Record the details in format ISF/FAS/03.

3.9 SAFETY CAUTION/SAFETY NOTE: Control Room should be informed before starting the job.

3.10 RELEVANT RECORDS:
Maintenance of Fire Hydrant / Block Valves: ISF/FAS/03

3.11 FREQUENCY OF RECORDS: Monthly

4. 0 MAINTENANCE OF FIRE WATER CUM FOAM MONITORS:

4.1 PURPOSE:

To provide guidelines for maintenance of Fire Water cum Foam Monitors.

4.2 SCOPE:

Scope of work includes maintenance of Fire Water cum Foam Monitors.

4.3 RESPONSIBILITY:

Officer In-Charge-FAS

4.4 REFERENCE:

OISD-STD-117

4.5 PRECAUTIONS: 1. Ensure that the Fire Engines are kept in manual mode so that they don't get started accidentally during maintenance of fire water cum foam monitors.

4.6 SPECIAL TOOLS/EQUIPMENT: NIL

4.7 PREREQUISITES: The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

4.8 MONTHLY MAINTENANCE & CHECKS:

1.1. Take work permit
1.2. Use applicable PPE as per matrix
1.3. ensure accessibility of monitor
1.4. Check
1.4.1. Visually the exterior of fire water monitor for any sings of corrosion, pin holes or damaged
Painting etc.
1.4.2. The condition of gland packing/ bushing/ valves on hydrant and monitor.
1.4.3. Grease the swivel joints of monitor for both horizontal rotation and vertical rotation with the help of grease gun and check for free movement.

1.4.4. Positive locking of both horizontal and vertical swivel joints for unattended operation

1.4.5. Condition of the handle for easy operation

1.4.6. For proper throw of water in either direction and remove any obstruction / check in the monitor.

1.4.7. The drain valve functioning

1.4.8. The condition of Thunder hose and foam pickup tube for any damage /leakage

1.5. After loosening the lock proper horizontal rotation of the water monitor in both horizontal and vertical direction without any obstruction.

1.6. Position the monitor in such a way that water will not fall on fire hydrant line. Record the details in the respective IMS format.

4.9 SAFETY CAUTION/SAFETY NOTE: Control Room should be informed before starting the job.

4.10 RELEVANT RECORDS: Maintenance of Fire Water cum Foam Monitors: ISF/FAS/04

4.11 FREQUENCY OF RECORDS: Monthly

5.0 MAINTENANCE OF FIRE/PRODUCT/ERV HOSES:

5.1 PURPOSE:

To provide guidelines for maintenance of Fire/Product/ERV Hoses.

5.2 SCOPE:

Scope of work includes maintenance of Fire/Product/ERV Hoses.

5.3 RESPONSIBILITY:

Officer In-Charge-FAS

5.4 REFERENCE:

OISD-STD-135

OISD-RP-167

IS 2190: 1992

5.5 PRECAUTIONS: 1. Ensure that the Fire Engines are kept in manual mode so that they don't get started accidentally during maintenance of fire water cum foam monitors.

5.6 SPECIAL TOOLS/EQUIPMENT: Hydraulic Pump & Pressure Guage.

5.7 PREREQUISITES: The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

5.8 HALF YEARLY MAINTENANCE OF FIRE HOSES:

1. Take work permit
2. Use applicable PPE as per matrix
3. Ensure accessibility of hose.
4. Check
    i. Visually for any exterior damage of hose and reinforced rubber lining
    ii. Proper functioning of coupling lock

iii. Water is drained from the hose after use.

5. Check. Proper functioning of male/female coupling.
6. Fire hoses shall be hydraulically tested once in six months as per relevant standards

MAINTENANCE OF PRODUCT/ERV HOSE:

Each hose shall be inspected/tested after 6 months of initial operation. Subsequent testing shall be done at 3 months' interval irrespective of the number of operations. However, each hose shall be visually checked for damage every time prior to use (as per OISD 135).
LPG hoses shall be inspected & tested at maximum interval of 4 months.

5.9 SAFETY CAUTION/SAFETY NOTE: Control Room should be informed before starting the job.

5.10 RELEVANT RECORDS:
Maintenance of Fire Hose**:** ISF/FAS/05
Maintenance of Product/ERV Hoses: ISF/FAS/17

5.11 FREQUENCY: Six-Monthly for Fire Hoses; Every Four Months for LPG hoses & Quarterly for Product Hoses

6. 0 MAINTENANCE OF EMERGENCY RESPONSE VEHICLE:

6.1 PURPOSE:

To provide guidelines for maintenance of Emergency Response Vehicle

6.2 SCOPE:

Scope of work includes maintenance of Emergency Response Vehicle

6.3 RESPONSIBILITY:

Officer In-Charge-FAS

6.4 REFERENCES:

Operations and Maintenance Manual of Manufacturer / supplier.

6.5 PRECAUTIONS: 1. Preliminary Checks should be done to before starting the pump, compressor and DG set.

6.6 SPECIAL TOOLS/EQUIPMENT: Hoses and Vacuum Pump

6.7 PREREQUISITES: The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

6.8 MAINTENANCE & CHECKS:

To be carried out every fortnight as per suppliers manual and same to be recorded in the Corresponding ISF format.

Vehicle documents to be kept updated:

6.1.8 Half-Yearly PUC
6.1.9 Annual Insurance
6.1.10 Annual Fitness Certificate.
6.1.11 Registration Certificate to be renewed (if applicable).

6.9 SAFETY CAUTION/SAFETY NOTE: Helper should be present while reversing the vehicle.

6.10 RELAVANT RECORDS:

Format No. ISF/FAS/07

6.11 FREQUENCY: MONTHLY

7.0 MAINTENANCE OF FOAM TENDER:

7.1 PURPOSE:

To provide guidelines for maintenance of Foam Tender

7.2 SCOPE:

Scope of work includes maintenance of Foam Tender

7.3 RESPONSIBILITY:

Officer In-Charge-FAS

7.4 REFERENCES:

Operations and Maintenance Manual of Manufacturer / supplier.

7.5 PRECAUTIONS-1. Preliminary Checks should be done to before starting the pump, compressor and DG set.

7.6 SPECIAL TOOLS/EQUIPMENT-NIL

7.7 PREREQUISITES- The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

7.8 PROCEDURE / MAINTENANCE & CHECKS:

To be carried out every fortnight as per suppliers manual and same to be recorded in the

Corresponding ISF format.

Vehicle documents to be kept updated:

7.8.1 Half-Yearly PUC
7.8.2 Annual Insurance
7.8.3 Annual Fitness Certificate.
7.8.4 Registration Certificate to be renewed (if applicable).

7.9 SAFETY CAUTION/SAFETY NOTE: Helper should be present while reversing the vehicle.

7.10 RELEVANT RECORDS: Maintenance of Foam tender: ISF/FAS/08.

7.11 FREQUENCY: Monthly

Minimum PPE required as per the matrix

PPE MATRIX

SL. NO.	Work / PPE	HELMET	SAFETY SHOE	GOOGLES	NOSE MASK	GLOVES	APARON	EAR PLUGS	SAFETY HARNESS	FACE SHIELD	WELDING MASK
1	WORK IN PUMP HOUSE	✓	✓		✓			✓			
2	LPG HANDLING WORKS	✓	✓	✓	✓	✓	✓				
3	ENTERING INTO OPERATIONS AREA	✓	✓				✓				
4	PIG LAUNCHING WORK	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5	FILTER CLEANING WORK	✓	✓	✓	✓	✓	✓				
6	WORK IN SUBSTATION	✓	✓	✓	✓	✓	✓				
7	LPG DRAINING IN MLIF	✓	✓	✓	✓	✓	✓				
8	EOT MAINTENANCE	✓	✓	✓	✓	✓	✓	✓	✓		
9	GRASS CUTTING WORK	✓	✓	✓	✓	✓	✓	✓			
10	WELDING WORK	✓	✓	✓	✓	✓	✓				✓
11	WORKING AT HEIGHT	✓	✓	✓		✓	✓		✓		
12	EXCAVATION WORKS	✓	✓			✓					
13	WORK IN BATTERY BANK ROOM	✓	✓	✓	✓	✓	✓			✓	

8.1 PURPOSE:

To provide guidelines for use and inspection of personal Protective Equipment

8.2 SCOPE:

Scope of work includes use and inspection of personal Protective Equipment

8.3 RESPONSIBILITY:

Officer In-Charge-FAS

8.4 REFERENCES:

Operations and Maintenance Manual of Manufacturer / supplier.
OISD-STD-155

8.5 PRECAUTIONS: For SCBA-Face Mask Leak Test and High Pressure Test should be conducted before donning.

8.6 SPECIAL TOOLS/EQUIPMENT: NIL

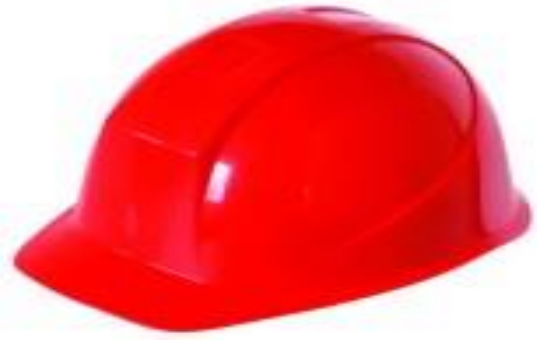
8.7 PREREQUISITES- The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

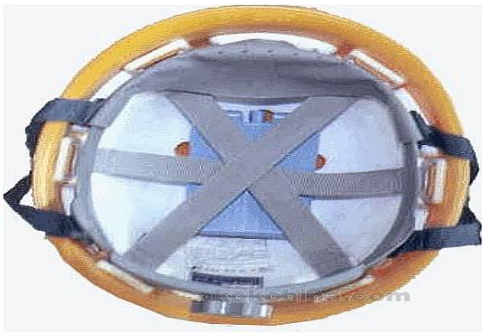
8.8 GENERAL GUIDELINES

a. PPE are used to protect the parts of body form injury or damage which the working conditions may cause. Falling objects, hitting a hard surface, excessive noise, dust, fumes, extreme temperatures, slippage, flash lights etc. are a few such conditions to which a person present in a work place may encounter any time. Appropriate PPE designed as per standards must be used to avoid injuries and damage.
b. PPE when used are exposed to tough conditions such as heat, abrasion dust etc. Hence PPE must be selected carefully meeting standards for the application.
c. Before use, proper procedure to wear a PPE must be understood clearly.
d. PPE must be visually inspected before each use for sound health of all components. Straps, Hooks etc. must be in position and in working conditions in secured manner. PPE with any sign of damage must not be used. In case of doubt also, PPE should be discarded.
e. Damaged PPE should be dFosed-off and should not be allowed to mix with PPE in good working condition.
f. PPE are used by the individual on work where these are exposed to dust, sweat, heat etc. Hence, as far as possible each user should be given independent set of PPE.
g. PPE after each use must be cleaned using water, soap with antiseptic solution. Chemicals (acidic or alkali or solvent etc.) and paints should not be used for cleaning unless recommended by the manufacturer.
h. PPE must be stored in a dry and cool place. Straps / flexible parts should be placed so that they are not bent / cramped on folding.
i. The checklist on PPE to be filled up by designated HSE Officer on quarterly basis and the same should be counter signed by Station-in-Charge with remark, if any.

8.8.1 HEAD PROTECTION

1. SAFETY HELMET





USAGE

For protection of head against hitting the fixed objects and falling objects in work area. Helmet should be selected according to IS 2945 or ISO International standard no. 3873 or equivalent.

PROCEDURE FOR USING SAFETY HELMET

The helmet should have appropriate shell size with adjustable chin strap. After wearing helmet, the chin strap must be tightened properly.

CRITERIA FOR SELECTION OF SAFETY HELMET

While selecting a helmet, its characteristics, the hazards against which protection is required and the conditions under which the helmet will be used, need to be considered.

1) The outer shell should be strong and resistant to deformation or puncture.
2) Helmets made of thermoplastic materials such as polycarbonate, ABS, polyethylene & polycarbonate glass fibre, fitted with a good harness provides the best protection against perforation.
3) Helmets with projections inside should not be used as they may cause serious injuries in the case of sideways blow.
4) The harness, chin strap of nape strap, brim and peak should conform to standards
5) If there is a danger of contact with electricity, only helmets made of thermoplastic material should be used.
6) For working overhead, particularly in the case of steel framework erectors, helmets must have chin straps to hold it firmly in place.
7) For high temperature areas, use of polyethylene helmets is not recommended;
8) Where there is a danger of crushing, helmets made of glass fibre reinforced polyester or polycarbonate and with a rim of at least 15 mm width should be used.
9) The helmet should be as light as possible
10) A full or half sweatband incorporated on the headband improves absorbency and reduces skin irritation.

11) Sufficient ventilation should be available through space between headband & shell & through ventilation holes where permissible.

12) INSPECTION BEFORE USE

- All components of helmet, shell, cradle, shock absorbing pad, chin strap are in proper place and securely fixed to the helmet
- Before use, inspect visually the headwear, shell, chin strap, cradle for any Cracks, damages, dents, etc.
- Do not use the helmet if any part is found damaged/missing, however minor it may be.
- Ensure the equipment is clean.

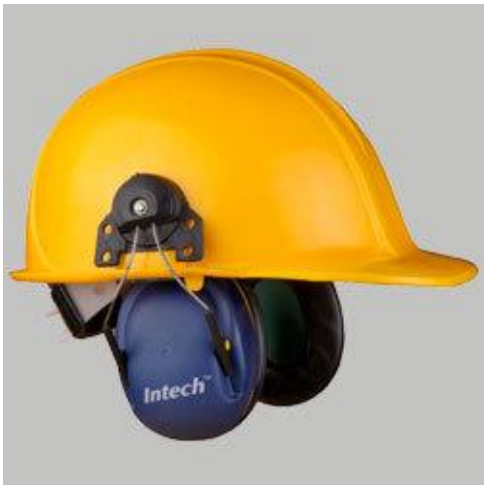
MAINTENANCE & CLEANING

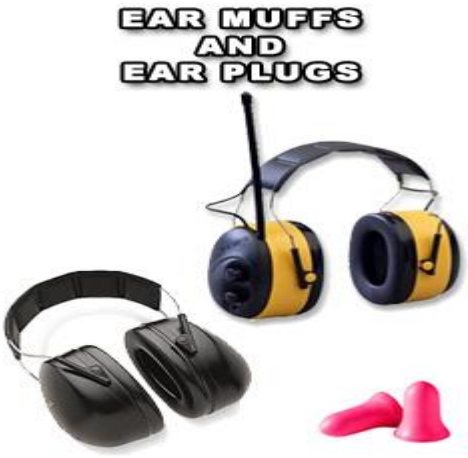
- All helmets must be kept in good, clean condition.
- It should be regularly inspected and replaced if damaged, dented, and cracked or shelf life expired.
- For cleaning the helmet use water and mild detergent.
- Don't clean grease/ tar spots on helmet using chemical and paints.
- Never drill any hole in the helmet.
- Do not keep helmets is sun as prolonged exposure to ultraviolet rays shortens the life of helmet. Shelf life of helmet is usually 4-5 years.

STORAGE

Store in cool, dry place, preferably in a poly-bag.

8.8.2 EAR PROTECTION





USAGE

Required for work area of high noise level (85 dBA and above)

TYPE

Ear Plug and Ear Muff. IS Standard: IS 9167: 1979-Specification for ear protectors

PROCEDURES FOR USING THE EAR MUFF

- Slide the ear cups to their lowest positions on the headband.
- Spread the cups apart and place around both ears across the head.
- The entire cushion surface should press firmly, but comfortably against the head.
- Adjust band for minimum space between head and band.
- Keep all foreign objects from under cushions and do not attempt to alter band.

PROCEDURES FOR USING THE EAR PLUGS

- Roll to a small crease free cylinder.
- Pull the top of the ear upward slightly.
- Insert the ear plug into the ear canal properly.
- Hold until plug expands.

SELECTION

Earplugs should:

- Reduce noise reaching the ear by 30 dBA in the higher (and more harmful) frequencies

- They shall give ample protection against sound levels up to 120 dBA. Ear-plugs should be elastic to the ear canal, and shall not give uncomfortable feeling to the user
- Ear plug shall not fall off easily from the ear when in use
- They shall be easily removable/insertion type and should be without sharp edges.
- All the material used should not cause any skin irritation
- Designed in such a way so that they could be used in synchronization with Ear Muffs

Ear muffs should:

- Reduce the noise reaching the ear by 45 dBA in the higher (and more harmful) frequencies. It shall give ample protection against sound level up to 135 dBA.
- They should be made in universal type
- Materials used should not cause any skin irritation
- Designed in such a way that they could be used in synchronization with Ear Plugs

INSPECTION

- Before use of ear muff, inspect the headband, cup, plug, for any cracks, damages, dents, etc.
- Ensure the cleanliness of the equipment
- Do not use the Ear Muff or Ear Plug if found damaged, however minor it may be.

MAINTENANCE & CLEANING

- All ear protectors must be kept in good, clean condition. They should be regularly checked and replaced if
  - Damaged (e. g. cracks or holes in muffs)
  - Ear muff seals are torn or hardened or the sound absorbent lining is exposed and damaged.
  - Ear plugs are not soft and resilient.
  - Headbands have lost their tension

STORAGE

- Store in a clean and dry place e.g. a plastic bag for ear plug: a locker or box for ear muffs.
- Plugs are not to be used again and should be dFosed off properly.
- Clean the ear muff with cotton wool dipped in antiseptic solution

8.8.3 EYE PROTECTION

GOGGLES

USAGE

Goggles are used for protection of eyes against impact from flying objects in workshops, chemical splashing and flash lights.

TYPE

Based on use goggles can be classified into:

- Acid Goggles
- Burning or gas welding goggles
- Spectacle type goggles
- Furnace goggles

IS Standard: IS 5983 : 1980 Eye protectors

PROCEDURE FOR USING SAFETY GOGGLES

- Clean the lenses. Wear the goggles and tighten the straps behind the head so that the goggles are fixed tightly in place.

SELECTION

- Safety goggles should conform to relevant IS standard: latest edition or any equivalent International Standard viz: EN, UL or FM approved.

INSPECTION

- Before use, inspect the condition of the eyewear, frame and lens / shields, headband for any cracks, damages, dents, etc,
- It is important that the person wearing goggles must be able to clearly see.
- Do not use the Safety goggles if found damaged, however minor it may be.

MAINTENANCE & CLEANING

- The lenses of eye protectors could be kept clean by thoroughly wetting both sides of the lens and drying them or removing grit with a brush.
- Regularly check for signs of damage and replaced if they become warped, scratched or brittle because of ageing

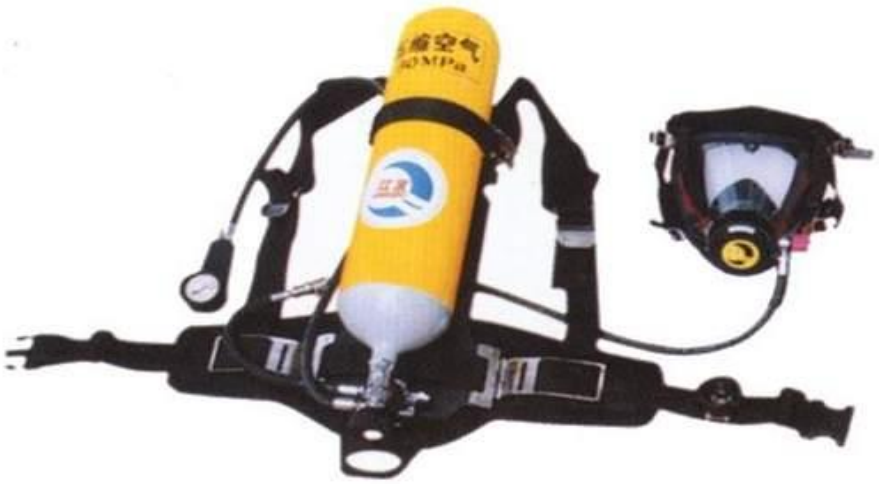
STORAGE

To be stored in clean, dry conditions away from chemicals preferably in poly-bag or hard case

The headbands should be in good condition and elastic

8.8.4 RESPIRATORY PROTECTION

1 SELF CONTAININED AIR BREATHING APPARATUS (SCBA)



USAGE

SCBA shall be used while working with or near any process likely to result in any harmful emissions or contaminants like smoke etc.

TYPE

Self Contained Air Breathing Apparatus.

INSPECTION

- Look for any torn rubber, dents, cracks and damages on the respirator. Always perform the fit test before wearing it for the first time and check it before each use.

- It must be borne in mind that apparatus designed for air cannot be used with oxygen cylinder and vice versa
- Do not use the SCBA if found damaged, however minor it may be.

SELECTION

The SCBA should conform to IS: 10245 Part 1 to 46 with latest amendment or equivalent International Standard. The cylinder and valve used in SCBA should be approved by CCOE and properly embossed.

MAINTENANCE & CLEANING

- Face mask/ Demand regulator should be clean and fit to wear.
- The breathing tube/ demand regulator should be clean, free from dust with no insects or any fungal growth.
- The neoprene rubber face mask should be of proper strength and should not have become soft with time.
- The cylinder should have sufficient pressure for supplying air for minimum 30 minutes.
- Replace the face mask of the respirator if it is damaged. Wash the mask with water & mild detergent. View screen should be clean for clear visibility
- Discard the dFosable respirator if damaged or breathing becomes difficult. Pressure gauge should be in working condition and warming whistle simulation should be working.

STORAGE

Store in a clean dry place preferably in poly-bag/ box or air tight container, protected from harmful contaminants, excessive moisture, heat, cold, sunlight and corrosive substances.

PROCEDURE FOR USING SCBA

- Inspect the face mask and connect the tubing with face mask.
- Connect the air cylinder with face mask tube.
- Check for air pressure. The air pressure should be minimum 80% of the capacity.
- Wear the cylinder on the back with back plate & valve facing downwards.
- Tighten the belt strap of the waist.

- Open the cylinder valve and put the face mask and check whether air is drawn normally through the mask.
- Tighten the strap of the face mask to put it in place. Once the warming whistles starts, it denotes that only 17% Air is left out in the cylinder and the person must come out from work area immediately. Face mask shall be removed immediately on reaching safe working place.
- Tests to be conducted before use: - The following two tests should be carried out before using the SCBA:
    - High Pressure Test- Check the pressure in the gauge provided. Alarm can be tested by opening the cylinder valve slowly and fully and then closing it fully so that the pipes are filled up. After closing the valve, air should be released slowly from demand regulator by pressing it against the palm of a hand. As the air in the tube is released, pressure will fall and whether the alarm is working or not can be checked.
    - Face Mask Leak Test-The face mask should be fitted snugly to the face and the valve of the cylinder opened slowly but fully. The valve should then be closed. The person will be able to breathe in the air in the tube for some time but once the air in the tubes get exhausted, the person should not be able to breathe. If the person is not able to breathe, it means that there is no leakage of air into the mask from the surrounding. The mask should be removed immediately after the person donning the SCBA indicates inability to breathe.

DONNING OPERATION:

1) Check the cylinder pressure.
2) Connect the regulator to the cylinder.
3) Keeps the cylinder with valve facing upward.
4) Get proper hold on the cylinder.
5) Ensure that the sliding side buckles are free.
6) Lift the cylinder above your head; ensure the side sliding straps come above your back via hands.
7) Fix the chest strap.
8) Pull lower sliding buckle with jerk to adjust cylinder.
9) Fix the waist strap, in this position cylinder lying on back, regulator valve fixed on cylinder will face towards ground.

10) Ensure that the positive pressure control lever near regulator inlet knob is in "OFF" position.
11) Open the regulator inlet knob.
12) Open cylinder valve fully.
13) Check the regulator gauge reading.
14) Fix the mask chin first, adjust chinstraps, then the temple and forehead straps and make it airtight.
15) Ensure air tightness by shutting hose end by palm and inhaling slowly. Mask should collapse on the face.
16) If it is air tight, connect the hose to the regulator and breathe on.

UNDONNING OPERATION:

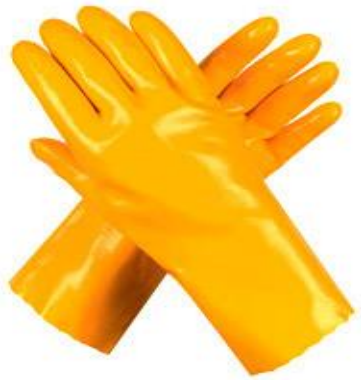
1) Move the position control lever near the regulator inlet knob to "OFF" position. (Downwards).
2) Disconnect the face mask hose connection from the regulator.
3) Remove face piece by loosening the maps.
4) Close the cylinder valve.
5) Remove the wrist strap.
6) Loosen the side straps.
7) Remove the chest straps.
8) Slowly lift the cylinder from the back.
9) Ensure that you enter the time and period of use in the record book.

CAUTIONS:

1) Cylinder valve should be opened.
2) It must be kept in mind that apparatus designed for air cannot be used with oxygen cylinder and vice versa.
3) The wearer should keep a watch on the pressure gauge so that he can leave the area safely even if the alarm fails.
4) When alarm within the regulator starts ringing, it is warning that only 20 to 25 % of air remains in the cylinder. Leave the contaminated area at once.

8.8.5 HAND PROTECTION

HAND GLOVES



USAGE

Hand and Arm protective equipment is intended to protect hands/arms where there is likelihood of injury as in the case of handling chemicals, solvents and jobs involving hot materials, radiation, electricity and abrasive and corrosive material.

TYPE

Chrome leather / asbestos gloves for temperature protection, polyvinyl chloride gloves for protection from chemicals leather and cotton gloves (IS 6994 : 1973 Part 1 Specification for safety gloves) and Rubber hand Gloves for Electrical use (IS Standard-IS 4770 : 1991-Rubber Gloves – electrical purposes – specification)

PROCEDURE FOR USING GLOVES

- Hold cuff with thumbs inside and stretch cuff slightly
- Swing glove outward and over towards the face two or three times, trapping air inside
- Squeeze inflated portion of glove with one hand, causing rubber to distend and magnify any defect

SELECTION

The hand gloves should conform to respective IS with latest amendment or any equivalent international Standard viz : EN, UL or FM approved.

INSPECTION

- Before using, inspect the gloves for any defects or imperfections.
- If in doubt, do not use and replace with a new glove.
- If gloves become ripped or punctured during use, replace with a new pair.
- Do not use the gloves if found damaged, however minor it may be.

MAINTENANCE & CLEANING

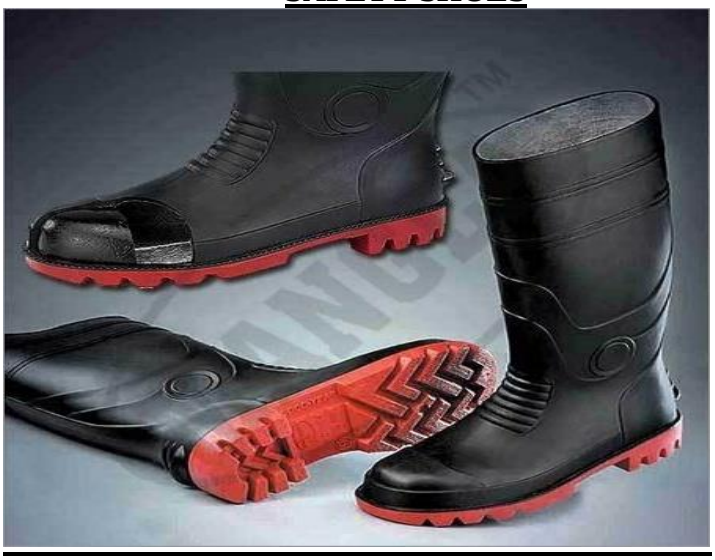
- Gloves should be maintained in good condition , checked regularly and discarded if deterioration (cracks, thinning, tearing) noticed
- Hygienic cleanliness of the gloves must be maintained.
- Periodic cleaning & maintenance by washing with antiseptic soap solution to remove the build-up of solvents,
- Degreasing agents etc. lengthens the life of the protector.
- Gloves with rough finish require thorough cleaning because the irregular surface forming the finish traps solutions which may cause deterioration.
- Electrical rubber hand gloves to be tested annually.
- Defective protectors should be scrapped and replaced at once.

STORAGE

- All types of Gloves must be stored in a cool, clean and dry place away from sun light.
- Gloves should not be allowed to come in contact with solvents, grease, turpentine or acids
- Regular inspection during storage must be ensured.

8.8.6 FOOT PROTECTION

SAFETY SHOES



USAGE
To protect feet and toes
TYPE
Safety shoes, safety boots

INSPECTION

- Visually inspect the safety shoes / boots for cracks and damages.
- Do not use the safety shoes if found damaged, however minor it may be.

SELECTION

The safety shoes should conform to respective IS with latest amendment or any equivalent International Standard viz: EN, UL or FM approved. IS Standard-IS 15298: 2002 Part 2- Safety, protective and occupational footwear for professional use– Specification for safety footwear.

- Since toes are most vulnerable to impact injuries, shoe with steel toe cap to be provided

- Rubber or synthetic outsoles with tread patterns to be to prevent risk of skidding

- Where electrical hazards exist shoes shall be entirely stitched and nails shall not be used
- Where static electricity may be present, safety shoes should have electrically conductive rubber out-soles

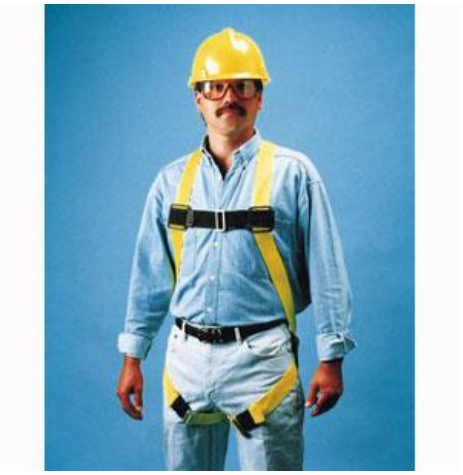
MAINTENANCE & CLEANING

- Safety footwear should be kept in good condition, checked regularly and discarded if worn out or deteriorated.
- Lances should be checked and replaced if necessary, Material lodged into the tread of the sole should be removed.
- The stitching should be checked for loose, worn or cut seams.
- Spraying the upper layers of new footwear with a silicone spray or applying a protective wax will give extra protection against wet conditions.

STORAGE
Store in a clean and dry place.

8.8.7 FALL PROTECTION

SAFETY HARNESS



USAGE
To be worn by those who are at risk of falling while working at height.

TYPE
Full body safety harness

OTHER ACCESSORIES
Fixed lanyard, lanyard with shock absorber, slide chuck independent lifeline

INSPECTION

- Before each use, a close visual examination should be made on the straps, seams, buckles, karabiner hooks and fittings. Make sure that the harness is in perfect working order with all components.
- Check that the harness is compatible with the other components of the fall arrest system or the restraining system
- Check karabiner hook before each use, in particular for deformation, signs of wear and tear and proper operation of locking system
- Do not use the Full Body Safety Harness if found damaged, however minor it may be.

SELECTION
The item should conform to respective IS: 3521:1999 with latest amendment or any equivalent International Standard viz., EN, UL or FM approved.

MAINTENANCE AND CLEANING

- Clean the straps and buckles in water and household soap. Never use acid or alkalis (caustic soda).
- Allow the harness to dry in a ventilated place for from any open fire or any other source of heat. The harness which get wet during use to be allowed to dry in the similar way.

STORAGE

- Store in a clean dry area, away from sunlight and in such a way that it does not warp or distort the belt.
- Avoid corrosive atmosphere and excessive heat or cold.

PROCEDURE FOR USING THE SAFETY HARNESS

- Only Full Body Safety Harnesses are to be used not the safety belts. The harness should be provided with a slide-chuck or some devices which could attach to an independent lifeline. Always use a reliable anchoring point above the user which is at least **6 meters above the floor when using lanyard with shock absorber.**
- Hold harness by back D-ring. Shake harness to allow all straps to fall in place.
- If chest, leg and / or waist straps are buckled, release straps and unbuckle now.
- Slip straps over shoulders so that D-ring is located in middle of back between shoulder blades.
- Pull leg strap between legs and connect to opposite end. Repeat with second leg strap. If using a belted harness, connect waist strap after leg straps. Waist strap should be tight, but not binding.
- Connect chest strap and position in mid-chest area. Tighten to keep shoulder straps firm.
- After all straps have been buckled, tighten all buckles so that harness fits snugly but allows full range or movement. Pass excess strap through loop keepers.
- Suitable lanyards with hook must be used along with the full body safety harness when working at height or descending or ascending ladders.

8.8.8 BODY PROTECTION

FIRE PROXIMITY SUIT / APRONS

USAGE

Protection against Heat radiation/ Chemical spills.

IS Standard-IS 4501: 1981 Specification for aprons, rubberized, acid and alkali resistant

TYPE

Full body fire proximity suit / aprons

INSPECTION

- Inspect the Aluminized fabric of the fire proximity suit for any tears or separation.
- Inspect the apron for any holes as this will allow the chemical to pass through.

MAINTENANCE/ STORAGE AND CLEANING

- The fire proximity suit should be stored in a cool, dry place in a proper box.
- The location should be prominently marked and known to every one of the location.

- The fire proximity suit should be cleaned regularly so that it is ready for use by anybody in case of emergency without any loss of time.
- The suit should not be hung from a hanger as it can sag or get deformed. Therefore, it should be stored in horizontal position.

PROCEDURE FOR USING

- The fire proximity suit is a one-piece suit.
- It is not possible to wear it single handedly, hence 2 persons must be present while wearing the suit.
- Put on the breathing apparatus, then put the face piece in position
- Unzip the suit, get inside the suit, once you are ready, zip the suit, after wearing please check whether you are comfortable and able to walk easily.
- In case you face difficulty / discomfort after wearing the suit, signal your companion who will help you to adjust the suit or unzip the suit if require.

8.9 **SAFETY CAUTION/SAFETY NOTE**: The person wearing the PPE should be trained in the use of PPE before first use.

8.10 RELEVANT RECORDS:

Inspection of PPEs: ISF/FAS/15

8.11 FREQUENCY OF RECORDS: Monthly

MAINTENANCE OF FIRE WATER / HYDRANT LINE:

9.1 **PURPOSE:**
To provide guidelines for maintenance of Fire Water / Hydrant Line

9.2 **SCOPE:**
Scope of work includes maintenance of Fire Water / Hydrant Line

9.3 **RESPONSIBILITY:**
Officer In-Charge-FAS

9.4 **REFERENCE:**

OISD 130, OISD 144, OISD 141.

9.5 **PRECAUTIONS**: PPEs (Safety Shoes and Safety Helmets) to be worn.

9.6 **SPECIAL TOOLS AND EQUIPMENT**: NIL

9.7 **PREREQUISITES**: The personnel carrying out the UT inspection should be well-versed with the procedure.

9.8 **PROCEDURE STEPS**:
Check for

9.8.1 Water leakage if any.
9.8.2 Dental bulges / cracks / support condition/connected equipment condition.
9.8.3 Condition of paint / protective coating or concrete coating.
9.8.4 External corrosion spots.
9.8.5 Pipe vibration.

UT INSPECTION (once in three years as per OISD 141 Clause 14.4.16)

Above ground piping and accessories shall be inspected visually once in a year for external corrosion. Ultrasonic thickness measurements shall be taken on exposed sections of the pipe once in 3 (three) years. Thickness measurement shall be taken at 4 locations (i.e. 12, 3, 6 and 9 O'clock positions) at the exits, bends and at every ten-meter interval of exposed

piping. Inspection of pipes, valves and fittings shall be carried out as per OISD-STD-130. Job to be carried out by Mechanical-In-Charge and records to be available with FAS- In-Charge.

9.9 **SAFETY CAUTION/NOTE**-Fire Engine should be kept on manual mode. Control should be kept informed.

9.10 **RELEVANT RECORDS**- ISF/FAS/12

9.11 **FREQUENCY**: Once In Two Years

10.0 **INSPECTION OF AFFF FOAM (3 % - C6):**

10.1 **PURPOSE:**

To provide guidelines for Inspection of AFFF Foam.

10.2 **SCOPE:**

Scope of work includes Inspection of AFFF Foam.

10.3 **RESPONSIBILITY:**

Officer In-Charge-FAS

10.4 **Reference**: IS 4989:2018.

10.5 **PRECAUTIONS**: 1. PPEs (Safety Shoes & Safety Helmets) to be worn. Chemical resitant Hand gloves to be worn.

10.6 **SPECIAL TOOLS AND EQUIPMENT**: As per Lab requirement.

10.7 **PREREQUISITES**: Testing should be done at an accredited laboratory.

10.8 PROCEDURE STEPS

Check for:

10.8.1 Foam compound should be stored as explained in IS-4989:2006/UL-162.

10.8.2 Storage place should be well ventilated.

10.8.3 Container shall not be exposed to directly expose to the sun rays.

10.8.4 Shelf Life: The recommended shelf life of AFFF is 10 years.

10. 8. 5 Testing: Foam concentrate should be tested for: -

a. pH
b. Sludge content
c. Surface Tension
d. Spreading coefficient expansion
e. Drainage Time
f. Foam concentrate liquid shall not show any sedimentation or stratification, contained in a covered glass beaker for 24 h at a temperature of 27 +/- 5°C.

Interval for testing is every two years and for Fire test every three years.

Quantity:
The aggregate quantity of foam solution should be calculated as below: -
Two hose streams of foam each with a capacity of 1140 lpm of foam solution for a minimum period of 65 minutes. From this the quantity of foam based on 3% or 6% proportion should be calculated as per standard.

10.9 **SAFETY CAUTION/SAFETY NOTE**: AFFF containers should not be exposed to direct sunlight.

10.10 **RELAVENT RECORDS:**
Actual Test Report from concerned agency.

10.11 **FREQUENCY** : Every Two Years for testing and Every Three Years for Fire Test.

11.0 MAINTENANCE OF FIRE BUCKETS:

11.1 PURPOSE:

To provide guidelines for maintenance of Fire Buckets.

11.2 SCOPE:

Scope of work includes maintenance of Fire Buckets.

11.3 RESPONSIBILITY:

Officer In-Charge-FAS

11.4 REFERENCE:

IS 2546:1974

11.5 PRECAUTIONS: PPEs to be used-Safety Helmet and Safety shoes

11.6 SPECIAL TOOLS/EQUIPMENT:NIL

11.7 PREREQUISITES: - The operating/service personnel should be well versed with the Operation and Maintenance Procedures.

11.8 PROCEDURE STEPS-GENERAL INTRODUCTION ON FIRE BUCKETS:

The fire buckets should be in line with IS 2546: 1974, latest edition. Fire buckets are used for storing sand to be used during emergencies for firefighting. These fire buckets are to be kept near strategic locations like Transformer yard, Pump house, MCC room etc. The main purpose of keeping fire buckets is to smoother the fire immediately and checks the spread of the same. The fire buckets can be put into operation quickly by even an untrained person.

However, it is essential that the sand in these fire buckets are kept in good condition, to be used in case of emergencies.

MONTHLY MAINTENANCE OF FIRE BUCKETS:

11.8.1 Ensure accessibility of fire buckets.

11.8.2 Check

11.8.2.1 Exterior of fire buckets for sign of corrosion, bad painting etc.

11.8.2.2 Inside is painted with white color and fire red outside. The letter "FIRE" has to be written on the newly painted buckets.

11.8.2.3 The condition of the sand in the buckets. There should not be any accumulation of water or moisture in the sand. Also no lump formation is to be allowed.

11.8.2.4 For presence of any moisture or lumps. In case any moisture is found, both the bucket and the sand shall be dried completely. Lump formation, if any, shall be removed.

11.8.2.5 Any unwanted grass, piece of paper or any other, miscellaneous items. The sand shall be free from any foreign materials.

11.8.2.6 The fire bucket is filled with required level of sand.

11.8.2.7 Bucket should be kept at suitable height for ease while operating the same.

11.8.2.8 Fire bucket should be placed in such a manner so that it can be conveniently used in case required.

11.8.2.9 The maintenance of the fire buckets should be carried out on monthly basis and the details are recorded in the format ISF/FAS/14.

11.9 SAFETY CAUTION/SAFETY NOTE: Adequate care should be taken to avoid injury from sharp edges and rusted parts.

11.10 RELEVANT RECORDS:

Maintenance of Fire Buckets: ISF/FAS/14

11.11 **FREQUENCY OF RECORDS**: Monthly

12.0 MAINTENANCE OF HOT FLARE UNIT: (APPLICABLE FOR LPG INSTALLTIONS)

12.1 **PURPOSE:**
To provide guidelines for maintenance of Hot Flare Unit.

12.2 **SCOPE:**
Scope of work includes maintenance of Hot Flare Unit.

12.3 **RESPONSIBILITY:**
Officer In-Charge-FAS

12.4 **REFERENCE:**
Operation and Maintenance manual- Supplied by manufacturer/supplier.

12.5 **PRECAUTIONS**:1. The vehicle should parked in place where it does not block the flow of movement.
2. LPG cylinders, DG set, Earthing rods should be checked before starting the operation

12.6 **SPECIAL TOOLS/EQUIPMENT**: Mechanical and Electrical Tool box. Electrical Testing Equipment-multimeter.

12.7 **PREREQUISITES**: The operating/service personnel should be well trained in the Operation and Maintenance Procedures of the Hot Flare Unit.

12.8 **PROCEDURE STEPS:**

12.8.1 INSTRUCTIONS FOR MAINTENANCE OF HOT FLARE UNIT:

12.8.1.1 Regularly check-up the gas lines for leakage of fuel gas and also leakage occurring in gas connections present in control panel. Applying soap solution and checking if bubbles are formed can detect leakage.
12.8.1.2 All Enclosures located on sterile radius should be checked as per circuit diagram.
12.8.1.3 Thermocouple fitment in the Pilot tip should be checked.
12.8.1.4 Regularly check setting voltage on ignition sequence & Flame sensing card. Failure of which results in failure of system in AUTO mode.
12.8.1.5 While doing any maintenance work, first emergency stop push button should be in operating condition or main switch in off condition.

12.8.1.6 Check the wire rope condition on regular basis & do the graphite greasing work.

12.8.2 Health Check Up for FFG System:

12.8.2.1 Regularly checkup the air & gas lines for leakage. Applying soap solution and checking if bubbles are formed can detect leakage.
12.8.2.2 Check all the manual as well as electrically operated ball valve, SOVs, ROVs present on Air & Gas line must be in healthy (Ready to work) condition.
12.8.2.3 Check the Control Circuit as per circuit diagram and ensure that there no any Discontinuity in power supplies to instruments & feedback signals from instrument is Present.
12.8.2.4 Check whether suitable time delay is given for proper mixing of air and fuel gas or not.
12.8.2.5 Regularly check that there should not be moisture present in both (Air & Gas) line.
12.8.2.6 Ignition spark plug must be in healthy (ready to work) condition.

12.9 **SAFETY CAUTION/SAFETY NOTE**: 1. Earthing should be done properly ensuring that the earthing rod is inserted at least 1 ft deep into the ground. Continuity of the earthing wire should be checked.
2. The rack should be raised gradually and jerks should be avoided.

12.10 **RECORDS**- Maintenance of Hot Flare Unit: ISF/FAS/16

12.11 **FREQUENCY OF RECORDS**: Monthly

13.0 MAINTENANCE OF EMERGENCY MAINTENANCE VEHICLE (EMV):

13.1 PURPOSE:

To provide guidelines for maintenance of Emergency Maintenance Vehicle (EMV).

13.2 SCOPE:

Scope of work includes maintenance of Emergency Maintenance Vehicle (EMV).

13.3 RESPONSIBILITY:

Officer In-Charge-FAS

13.4 REFERENCE:

Operation and Maintenance manual- Supplied by manufacturer/supplier.

13.5 PRECUATIONS: 1. The vehicle should parked in place where it does not block the flow of movement.
2. DG set, Compressor and welding machine should be checked before starting the operation

13.6 SPECIAL TOOLS/EQUIPMENT: NIL

13.7 PREREQUISITES: The operating/service personnel should be well trained in the Operation and Maintenance Procedures of the Hot Flare Unit.

13.8 MAINTENANCE & CHECKS:

To be carried out every fortnight as per suppliers manual and same to be recorded in the Corresponding IMS format.

Vehicle documents to be kept updated:

13.5.1 Half-Yearly PUC
13.5.2 Annual Insurance
13.5.3 Annual Fitness Certificate.
13.5.4 Registration Certificate to be renewed (if applicable).

13.9 SAFETY CAUTION/SAFETY NOTE: 1. The ladder for getting inside the vehicle should be taken out with caution as it can cause injury.

13.10 RECORDS: Format No. - ISF/FAS/18

13.11 **FREQUENCY OF RECORDS:** Monthly

14.0 INSPECTION OF FIRE SIREN:

14.1 PURPOSE:

To provide guidelines for inspection of Fire Siren.

14.2 SCOPE:

Scope of work includes inspection of Fire Siren.

14.3 RESPONSIBILITY: Officer In-Charge-FAS

14.4 **REFERENCES:**
OISD-STD-117, PNGRB regulations

14.5 **PRECAUTIONS:** All stakeholders should be informed before testing the siren so that it does not create panic.

14.6 **SPECIAL TOOLS/EQUIPMENT-NIL**

14.7 **PREREQUISITES**- The personnel should be well aware of the Fire Siren Code.

14.8 PROCEDURE CHECK:

14.8.1 Hand operated Siren clearly marked in the installation. Ensure accessibility of Hand Operated Fire siren
14.8.2 Electric fire siren switch is identifiable and easily accessible.
14.8.3 Electric fire siren shall be audible as per regulations and standards.
14.8.4 Electric fire sirens connected to UPS feeder to ensure continuous power supply during emergency shut down.
14.8.5 The following fire siren codes should be followed for different emergency situations.

FIRE: For fire situation, the siren shall be wailing sound for 2 minutes.
DISASTER: For disaster situation, the siren shall be wailing sound for 2 minutes repeated Thrice with a gap of 60 seconds.
ALL CLEAR: For all clear situation, the siren shall be straight run sound for 2 minutes.
TEST SIREN: For testing, the siren shall be straight run sound for 2 minutes.

14.8.6 **INSPECTION:** Electric and hand operated fire sirens should be tested once a month.

14.9 **SAFETY CAUTION/SAFETY NOTE**: Only test siren should be operated during monthly testing and other modes like disaster.

14.10 **RECORDS:** Format No. - ISF/FAS/19

14.11 **FREQUENCY OF RECORDS**: Weekly

15.0 MAINTENANCE OF CLEAN AGENT TYPE FIRE EXTINGUISHERS:

15.1 **PURPOSE:**

To provide guidelines for maintenance of portable Clean Agent Extinguisher.

15.2 **SCOPE:**

Scope of work includes maintenance of portable Clean Agent Extinguisher.

15.3 **RESPONSIBILITY:**

Officer In-Charge-FAS

15.4 **REFERENCES:**
OISD-142 IS 15683: 2006 (R2012)

15.5 **PRECAUTIONS**: Mandatory PPEs- Safety Shoes and Safety Helmets

15.6 **SPECIAL TOOLS/EQUIPMENT**: NIL

15.7 **PREREQUISITES**: The operating/Service Personnel should be well-versed with the operation/maintenance procedures.

15.8 **PROCEDURE STEPS:**

INSPECTION AND MAINTENANCE:

15.8.1. Take work permit
15.8.2. Use applicable PPE as per the matrix.
15.8.3 Ensure accessibility of Clean Agent Extinguisher
15.8.4. Check:
15.8.4.1 Shell of the extinguisher externally once a month to check for any mechanical damage or corrosion.
15.8.4.2 Condition of discharge horn and handle
15.8.4.3 The painting damage/deterioration.
15.8.4.4 The soundness of the brazing/welding of the neck ring.
15.8.4.5 The spring for corrosion.
15.8.4.6 Nozzle and Discharge fittings for erosion.

15.8.4.7 The squeeze grip valve for damage.
15.8.4.8 The hose condition, Pressure indicator
15.8.4.9 Condition of seal/safety pin.
15.8.4.10 Pressure gauge reading or indicator in the operable range or position
15.8.4.11 nspection date on the tag provided
15.8.4.12 Condition of Discharge horn and handle

15.8.5 HYDRAULIC PRESSURE TESTING:

15.8.5.1 A hydrostatic test of the cylinder shell along with assembly shall be done before every refilling or as per statutory requirement whichever is earlier.
15.8.5.2 During the pressure testing, there shall not be any leakage or visible distortion. Extinguisher that fails in this requirement shall be rejected.
15.8.5.3 Extinguishers to be hydro tested and refilled by the PESO approved vendor using test bench & calibrated pressure gauge
15.8.5.4 Ultrasonic thickness inspection of shell shall be carried out once in 3 years.
15.8.5.5 Ultrasonic thickness inspection of shell shall be carried out during each hydrotest. Record the same in history card.
15.8.5.6 Pressure Indicator should be calibrated at the time of recharging.
15.8.5.7. The hose on the portable extinguishers shall be replaced within three years.

15.9 **SAFETY CAUTION/SAFETY NOTE**: 1. If an extinguisher is removed from its designated place for operation/inspection it should be put back in its place if it has not been used up and replaced with another one if it is used up. The Fire Extinguisher which has been used should be kept in a horizontal position to indicate that it is empty.

15.10 **RECORDS:** Format No: ISF/FAS/13

15.11 **FREQUENCY OF RECORDS**: Monthly

16.0 INCIDENT REPORTING:

16.1 **PURPOSE:**
To provide guidelines for reporting of any incident/accident.

16.2 **SCOPE:**
Scope of work includes reporting of any incident/accident, classification of incident, modes of communication.

16.3 **RESPONSIBILITY**: Officer In-Charge-FAS/LIC

16.4 **REFERENCE:**
HPCL/CMD/GOVT/2019/1083 dated 15.09.2019 (Letter Ref No. P-45011/54/2019-Distribution-PNG dated 31.12.2018) & Approved Crisis Management Plan 2018 – Section 7 (Pipelines, Page 77 to 84).

16.5 **PRECAUTIONS**: 1. The category of incident should be identified clearly.

16.6 **SPECIAL TOOLS/EQUIPMENT**-Not Applicable

16.7 **PREREQUISTES**- The officer reporting the incident should trained in Incident Reporting.

16.8 **PROCEDURE STEPS:**

MAJOR REPORTABLE INCIDENTS TO MOP&NG:

1. Any incident of fire not extinguished in 15 minutes
2. Any incident causing shutdown of operations on account of fire/explosion/leakage
3. Any incident causing financial loss above Rs. 20 lakhs
4. Any incident leading to fatality(s) within plant/location premises
5. Any incident causing major loss of containment and having adverse impact outside the plant/location premises including disasters defined under section 2 (d) of DMP Act 2005
6. Any incident of road accidents (during transportation of petroleum product resulting in fire/explosions which in turn leads to fatality (s)
7. Cumulative man hours lost more than 500 hrs
8. Sabotage, subversive activities by terrorist groups inside licensed area

9. Any incident not covered above but which gets reported in the national media within 24 hours of the occurrence

RESPONSE TIME FOR IMMEDIATE/DETAILED INFORMATION:

1. The time taken by immediate information report to reach secretary (PNG) /concerned Joint secretary/ Nodal joint secretary in case of such events shall not be more than 1 hour by phone/email/SMS from the actual event.
2. If the time taken to report was longer than 1 hour, debriefing report on the actual time taken along with mitigations measures taken to avoid delay to be sent to MOP&NG.
3. Subsequent detailed information report shall be sent twice a day to MOP&NG control room/concerned JS in MOP&NG.

MODES OF COMMUNICATIONS:
1. Test message (SMS) and e-mail message.
2. Call on cell phone, if not available on land line of the concerned officers

INCIDENT REPORTING:
Any untoward incident/accident to be reported on the Online platform for Incident Reporting in the HP Portal by the location. Report to be submitted to HQO through HO within 24 hours of the incident.

Note:
1. Phone/email/SMS shall contain brief details as captured as accurately as possible along with caveats if any.
2. First information report shall be given immediately on noticing the incident followed by detailed report thru e-mail
3. The CPSU –C/R will have accountability to ensure that information reaches the District Magistrate and the state chief secretary (here accident has occurred) through their state office or local representatives.

16.9 **SAFETY CAUTION/SAFETY NOTE**:- Timelines should be strictly adhered to ensure smooth flow of information both ways.

16.10 **RECORDS/FORMATS**-Online Format

16.11 **FREQUENCY OF RECORDS**- AS AND WHEN AN INCIDENT TAKES PLACE.