

SAFETY RULES AND ELECTRICAL POINTS

SAFETY RULES AND REGULATIONS: As per the Clause 8.4.0.0 of GCC and Clause 9.0.5 of our MINI G.C.C. Please find enclosed herewith latest "Safety Guidelines and Rules for Contractors & their workers" Issued by our Company which shall be strictly complied. You shall provide the following basic item to personals.

- 1) Safety Helmet/welder's helmet. /Welder's goggles
- 2) Safety shoes.

If you shall not comply with above safety measures, than GNFC shall deduct the penalty per person on per day basis as per the instruction of the respective Engineer-in-Charge. The details the charges deducted from your bill shall be as follows:

- 1) Rs. 500/--without safety shoes.
- 2) Rs. 100/--without safety helmet.
- 3) Rs. 1000/--without safety belt while working at height above 4 meters.
- 4) Rs. 100/--without safety goggles, hand gloves & welding helmet while doing grim welding work.

Note: Non Compliance of safety rules and regulations can result in cancellation of the contract and eventual disqualification.

ELECTRICAL POINTS:

The contractor shall have to take care of the following Electrical points strictly as per the Ss code of Industry:

1. Each machine shall have power supply isolation switch in IP-55 enclosure and minimum 30 M length of 10 mm. sq.cu flexible wire with PVC insulation.
2. Isolation switch shall have HRC fuses of suitable ratings. (32 A) with earthing bus.
3. Outlet of welding machine (i.e. holder cable and return earth cable) is to be laid up to job and return cables should be connected with job.
4. All power cable connections and joints are to be made through lugs, to avoid heating and fault.
5. Each electrically operated machine shall have earth leakage operated MCB to isolate power in case of electric shock to human.
6. Regulator extensions are to be connected through three pin socket.
7. The contractor must get his machine examined once in three months from the respective Electrical group and insulation resistance value of the machine and their associated accessories should be maintained more than 2 M Ohm.
8. The I.R. value of welding cables should be periodically checked and replace if IR value is lower than 1 M Ohm.
9. The physical condition of cables must be monitored and if it is found punctured / damaged, it must be replaced.
10. There should not be any joints in between the length.
11. During the job, connecting the cable to the structure where the welding work is to be done must ensure proper earthing.

12. The welding cables, which are to be used, must be cleaned and dried periodically during the job.
 13. No welding Machines should obstruct the work area / passage ways / stairways.
 14. All the welding Machines should have proper safety devices such as Fuse / ELCB / plugs etc.
 15. All the ELCB with weatherproof enclosure shall be mounted vertically, on welding machines and the contractor shall do proper weatherproofing.
 16. Preferably continues length of welding and power cable for machines shall be connected with proper and terminals. Jointing of welding cables with holder clamps is not safe and, if unavoidable, bolted and insulated joints should be used. Return cable should be connected to the nearest point of job, thereby preventing stray current from causing any damage to some rotary machine bearing, plant piping or earthing system of Instrument or Electrical.
 17. Contractor shall use proper pin top or power plug for connection to electrical power source. Only authorized and experienced electrical technician of contractor should work on electrical system.
 18. Electrical power connections to welding machines and other portable hand tools etc is done after issuance of safety permit by plant's Shift-in-Charge. Many a times these equipment's remain connected unused after the completion of the work and expiry of permit. In hazardous areas, power connection/disconnection should be done with work. Permit. Work permit should be cleared / closed only after disconnection of equipment.
 19. Whenever permitted power connection to work is likely to remain unused for long duration, say in night hours, it should be got switched off.
- Date: Sign& Stamp of the contractor

SAFETY CODE / GENERAL SAFETY RULES

5.1 GENERAL:

In case of various maintenance & modification activities number of hazards is involved. The following are some of the hazards that may be encountered:

- (a) Gas, Fumes
- (b) Corrosive hot & other liquid
- (c) Sludge
- (d) Gas or liquid under pressure
- (e) Trace Heating
- (f) Toxic material
- (g) Falling objects
- (h) Fire & Explosion
- (i) Noise
- (j) Steam/Condensate
- (k) Dust
- (l) Moving machinery
- (m) Hot metal
- (n) Under-ground services
- (o) Excavation Hazards
- (p) Electric shock/burns
- (q) Traffic Road/Rail
- (r) Lifting tackles/tools failure
- (s) Work at height

- (t) Work on fragile roof/ceiling
- (u) Electricity mains/static electricity
- (v) Over head hazards, moving cranes etc
- (w) Radioactive substances/sources
- (x) Confined space hazards entry
- (y) Hand tools/portable tools hazards

As mentioned above all persons involved in job will have to look out for hazard & to take necessary actions so that accident can be prevented.

Contractor shall adhere to safe working practice and guard against hazardous and unsafe conditions and shall comply with company's safety rules as laid down from time to time. Some of the safety rules are set forth herein.

- a. Unauthorized entry into any battery limit of plant is strictly prohibited.
- b. It is forbidden to take children & under age workers in side the factory.
- c. Smoking & carrying matchbox, cigarettes, lighter, bidis etc. are prohibited.
- d. Photography & carrying cameras/Mobile phones are strictly prohibited in all areas.
- e. Reckless driving or other non-observance of traffic safety rules shall result into withdrawal of permission to carry vehicles in side factory.
- f. When you are given permission to enter in GNFC complex you are to go only to the location, which you have been authorized. Don't visit or loiter in any other plants/premises. When exiting the plant, you have to leave through the gate you entered, unless otherwise directed, in case of emergency.
- g. All necessary personal protective equipment (PPEs.), Safety equipment should be made available to use for persons employed by the contractors on the site & shall be maintained in condition suitable for immediate use. Protective equipment for head protection, body protection, eye protection, hand protection, hearing protection & respiratory protection shall be made available by the contractor.
- h. Don't check gas leaks with lighter, matches or other flame.
- i. Don't tamper with any type of electric switches-equipment or any other appliances or moving machinery installed in factory area.
- j. Don't operate any switch, valve etc., without permission.
- k. Be careful to keep all aisles, passageways and stairways clean & unobstructed. All discarded metal & other scrap should be collected.
- l. Storage area for keeping equipments, machines & other raw materials should be isolated & properly protected.
- m. It is forbidden to remove guards from moving machinery or to clean/check moving parts of machines while in motion.
- n. Before commencing repairs on a machine main power supply to it should be cut-off & locked. Display cautionary tags on starting switches. Before you start make sure that everything is in the clear. Guards/covers should be put in position.
- o. Any person without obtaining prior permission from the concerned supervisor should undertake no works on any machinery/equipment/piping.
- p. It is prohibited to work on or near moving machinery by wearing loose clothing.
- q. Nobody should try to clean, lubricate any part of the machinery while the machine is in running.
- r. Welding cables & connections should be in good condition & fix the earthing cables at the welding place only.
- s. Starting of any machines or power tools or turning on steam/power or gas should be done only after ensuring that nobody is in danger.

t. Sitting or walking on rail tracks, crossing between wagons, taking rest under stabled wagons, crossing the rail through the openings underneath the stationary wagons are Strictly prohibited.

5.2 FIRST AID AND INDUSTRIAL INJURIES:

All critical industrial injuries and dangerous occurrences shall be reported promptly to Officer /Engineer-In-Charge, and a copy of contractor's report for each injury requiring the attention of a Doctor/Physician shall be furnished to company (Fire & Safety Dept.) in the prescribed form.

5.3 NO SMOKING RULES:

Carrying / Striking of matches / lighters inside the factory premises and smoking with in the factory premises are strictly prohibited. Violators of the 'No Smoking Rules' shall be discharged immediately, and suitable disciplinary actions shall be taken against respective Contractor.

5.4 VEHICLE ENTRY & TRAFFIC RULES:

i) Entry to vehicles at 'Hazardous Area' or 'Battery Limit' in GNFC's premises is restricted and only the vehicles fitted with PSPO approved Exhaust Muffler will be allowed in Hazardous Area or Battery Limit.

ii) The driver of the vehicle must have a valid driving license for the type of vehicle he is driving.

iii) The vehicles must have a valid vehicle license and be covered by an insurance policy in respect of third party risks.

iv) All drivers must observe speed limit signs. The speed limit inside the premises is 20 KM/HR.

v) Drivers must comply with all traffic rules, regulations and signs at all the times and Vehicle should not be parked in such a way that it obstructs the movement of Emergency Vehicle like Fire Tender & Ambulance.

vi) Vehicles must not be loaded beyond the licensed carrying capacity.

vii) Vehicles should never be left unattended unless the engines have been switched off and hand brakes firmly applied.

viii) Traffic accidents in the GNFC premises involving injuries or damage to property must be reported to GNFC immediately.

ix) Vehicles must be parked at the appropriate parking spaces provided but not on the roadways or blocking the fire fighting equipments.

x) The driver must ensure that adequate clearance will be maintained between the overhead pipe racks and the vehicle, while passing underneath the pipe racks.

xi) Materials on the vehicles must be securely placed.

5.5 PERMIT TO WORK SYSTEM:

All jobs within the GNFC complex will be carried out through permit to work system. All permits must be retained at work site for inspection. All instructions stipulated in the permit must be strictly followed. The relevant permit shall be obtained from Officer / Engineer-In-Charge.

1. PERMIT TO WORK

For carrying out any job, a written permission to work is required.

2. SAFETY PERMIT

For all hot jobs, such as welding, gas cutting, grinding, lighting of any open fire, Safety Permit shall also be obtained in addition to permit to work.

3. VESSEL ENTRY PERMIT / (SAFETY PERMIT)

For all jobs requiring entry in to confined space or vessels, tank, pit etc vessel entry permit shall also be obtained in addition to permit to work.

5.6 WORKING AT HEIGHT / SCAFFOLDING:

All efforts shall be put to prevent fall from heights by proper approaches, scaffoldings, platform, ladders safety-nets, safety belts with life lines/hoists/lifts etc.

(a) By advance planning a safe procedure must be prepared by the concerned contractors talking-up the job at height in consultation with the Supervising Engineer In-charge/Manager In-charge/Dept., Fire & Safety Department & Plant Area In-charges. Thus prepared safe procedure should be implemented.

(b) Work permit system shall be followed rigorously in all cases/all jobs in operating areas as per the normal work permit system.

(c) Permit shall be renewed at the beginning of every-shift, as per the normal procedure.

(d) No person shall be allowed to work at height without work permit in any are of the factory, except clearly defined new project areas, If they have been specifically and permitted, however, in case of such new project sites, all precautions mentioned herewith must be followed without fail.

(e) Erection & use of proper type of scaffolding as recommended by I.S.:3696, I.S.:4014, I.S.:4912 and other relevant codes. Scaffoldings shall be with white platforms, toe-boards, railing etc. provide proper approach access and escape.

(f) In case of suspended scaffoldings double suspensions shall be ensured. Provide approach and escape from platforms.

(g) Use of safety Belts with life line anchored with the firm support shall be ensured. Suitable anchorage lines should be made for tie-up Life Line, if required.

(h) While working on roofs fragile roofs top safe walk-ladder shall be used along with Safety Belts/ Safety Nets. Work permit is essential such jobs.

(i) Provision of proper approaches to platform/workplace, including use of mechanized equipment like crane shall be made.

(j) Ladders can be used for proper approach with firm support & ladders of adequate strength & size.

(k) Covering of pits, sumps, cutouts made for erection, cutouts/opening formed, due to removal of structure/ vessels/equipments shall be ensured. Railing also should be done. Toe guards should be provided.

(l) All structure openings/floor openings posing fall hazards shall also be covered with adequate strength.

(m) Safety Belts & safety Nets also shall be used while working at height. Safety Nets shall be used when ladders/scaffolds, suspended Plat-forms, Temporary floors or safety Belts are impractical or these facilities do not remove the hazards of fall.

(n) Efficient inspection & maintenance of scaffoldings/ladders/safety belts & other fall protection equipments shall be done by the Concerned Supervisors Scaffoldings are checked before every-use.

(o) No job shall be taken-up near the moving dangerous machines which pose fall risk as well as entanglement.

(p) Adequate Training & Education shall be imparted to all work-Men, for working at height as well as in use of Personal Protective Equipments.

(q) Safety Helmets which can protect Head Injury, against falling Objects fit firmly shall be used.

(r) Working at height should be avoided in adverse weather conditions. Work site should be properly illuminated.

(s) The erection, alteration or dismantling of scaffolds shall be carried out by Competent workmen posing adequate experience of such work and under the immediate supervision of a competent person.

(t) Scaffolding shall be provided for workmen for all works that cannot safely as can be done safely from ladders. When a ladder is used, an extra workman shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal & 4 vertical).

(u) Scaffolding or staging above the ground or floor, swing or suspended from an overhead support or erected with stationary support shall have a guard/rail properly attached.

(v) Working platform, gangways and stairways should be so constructed that they should not sag unduly or unequally.

(w) Every opening through which any person is liable to fall in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 3'.

(x) Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed.

(y) All scaffolding shall be properly maintained and inspected by a competent person monthly, since exposure to weather conditions likely to affect their strength or stability.

(z) Adequate precautions shall be taken to prevent danger from electrical equipments.

(aa) No materials on any of the site of work shall be so stacked or placed as to cause danger or in convenience to any person or public.

(bb) The contractor shall also provide all necessary fencing and lights to protect the workers and staff from accidents.

(cc) When work has to be done on elevated places, towers, roofs, pipe racks & other lofty positions where plat-forms & other fall guards are not there, use of SAFETY BELT is compulsory. Safety Nets will prove very helpful in case somebody slipped from height.

5.7 INFULENCE OF ALCOHOL OR DRUGS:

It is absolutely prohibited for any person to work while under the influence of alcohol or drugs.

5.8 HORSEPLAY:

Horseplay in any form is strictly forbidden.

5.9 CONTRACTOR'S BARRICADES:

A) Contractor shall erect and maintain proper barricades required in connection with his operation to guard or protect.

(i) Excavations

(ii) Hoisting areas

(iii) Areas adjudged hazardous by contractors and Company's officers.

(iv) Company's existing property liable to damage by contractor's operations, in the opinion of Officer / Engineer-In-Charge.

(v) Contractor's employees shall become acquainted with Company's barricading practice and shall respect the provisions thereof.

5.10 EXCAVATION AND TRENCHING

All work below ground-level is dangerous. Excavation work usually indicates the commencement of work, but sadly, it can become the termination of life for an employee. Anyone or combination of the following can cause accident.

b. Unknown soil structure,

c. Lack of care in unstable soil,

d. Inadequate protection,

e. Poorly secured protection,

f. Lack of care, during weather changes,

g. Insufficient inspection &

h. Inexperience supervisors and work force.

To avoid accident, we must try to eliminate the causes by taking precautions like-

EXCAVATION

- The line contractor shall ensure that no excavation work shall be carried out without the issue of an excavation permit.
- For excavation over one meter in depth an entry to confined space permit shall be required in restricted areas, because of the potential for flammable and or toxic gases and oxygen deficiency.
- Any buried cables or pipelines unexpectedly encountered during excavation work shall be reported immediately to engineer and work shall cease.
- Shoring shall be rigid and without holes or opening, and be properly braced with support structure.
- The shoring of every excavation where men are to work shall be examined each day by contractor's representative named on the excavation permit.

DANGER AT EXCAVATION EDGES

- No load, plant or equipment should be placed or moved near the edge of any excavation where it is likely to cause the collapse of the side of the excavation.

EXCAVATION BARRIERS

- Excavation in which persons are working and into which a person is liable to fall shall be suitably or protected by barrier. If the excavation is to remain open after dark, warning lights shall be placed around the excavation to warn others of its presence.
- The contractors shall be responsible for the provision of all barricades, roping off and the provision of flashing lights as is required for the safety of persons and vehicles.

- i) Excavated earth must not be dumped within five feet. The further the better.
- ii) Passages/Bridges across trenches should be provided with hand rails & toe board.
- iii) Entry permit should be obtained while entering a pit with a depth of more than one meter.
- iv) No pit should be left unguarded / uncovered. Provide proper barriers around the pit when persons are not working in it. Red illuminated signal should be displayed so that nobody goes near the pit during dark hours.
- v) Only limited person should be allowed to enter in pit for digging or dumping of excavated earth when digging is going on. Two works should not be carried out simultaneously. Also before starting digging or dumping proper tools should be used during digging & dumping operation.
- vi) Proper arrangement of ladder should be made to enter into the pit.
- vii) No work, however, small should be under taken / started without obtaining valid work permit from the concerned department.
- viii) Confined space entry should be done only by valid entry permit from the Engineer-in-charge.
- ix) Proper approaches/scaffoldings/ladders etc. must be provided to avoid falls.
- x) All Persons employed in operation trucks/ tractors and other material handling equipments must have valid license.

5.11 DEMOLITION:

- i) Before any demolition work is commenced and also during the process of the work all roads and open area adjacent to the work site shall either be closed or suitably protected or barricaded.
- ii) No electric cable or apparatus, which is liable to be a source of danger, or a cable or apparatus used by the operator, shall remain electrically charged.
- iii) All practical steps shall be taken to prevent danger to persons employed, from risk of fire or explosion or flooding.
- iv) No floor or other part of the building shall be so overloaded with debris or materials so as to render it unsafe.

5.12 PERSONAL PROTECTIVE EQUIPMENT:

- i) Personal protective equipments as considered necessary by Fire & Safety In charge, should be made available by a contractors as per the relevant IS standard or duly approved by Fire & Safety In charge.
- ii) Safety Helmet, Safety goggles and Safety shoes etc. as considered necessary by the Officer / Engineer-In-Charge / Fire & Safety In-charge should be made available by contractor for use by the persons employed at the site and maintained in a serviceable condition thereafter by taking adequate steps to ensure proper use of equipment by the concerned.

Further in continuation above point all the types of Hand Gloves like Nitrile, Neoprene, PVC (Supported & Un Supported), Cotton, Knitted, Leather etc as considered necessary by the Officer / Engineer-In-Charge / Fire & Safety In-charge, to be made available either by contractor or by company (On chargeable basis) for use by the persons employed at the site and maintained in a condition suitable for immediate use. The contractor should take adequate steps to ensure proper use of equipment by those concerned. But all the used, damaged & contaminated Hand Gloves generated during the use or work are not to be thrown here and there in the plant but to be deposited to the concerns Department for effective disposal. Other personal protective equipments like Escape masks will be issued by the company on returnable basis and contractor has to return back the escape mask issued to them on the termination or completion of the contract or annual rate contract to Fire & Safety Department. If the contractor is unable to return the item issued to them on returnable base after the completion or termination of contract, than company will deduct the cost of these escape mask on the advice of Fire & Safety In-charge from the final bill of the contractor or from the retention money available with the company. But during the contract period the consumed or exhausted fitter or cartridge of the escape mask will be replaced FREE OF COST if deemed necessary by Fire & Safety In-charge.

All the other special personnel protective equipments like Airline Masks, CABA sets, PVC Suit, Chemical Resistance Suit, Heat Resistance Suit etc as considered necessary by the Officer / Engineer-In-Charge / Fire & Safety In-charge shall be supplied by M/s. GNFC to contractor free of cost on returnable basis.

After use of such equipments it is responsibility of contractors to keep them in serviceable condition and return to Fire & Safety Department or keep at designated location. Failure to do so shall attract recovery of cost from the contractor.

iii) Suitable eye protectors must be worn whilst carrying out operations such as grinding, welding and cutting, handling and mixing of chemicals, concrete breaking or any other works specified in the schedule of specified processes of the Gujarat Factories Act and Rules.

iv) Suitable ear protection must be worn whilst working inside a high noise area.

v) Suitable respiratory protection must be worn when there is a risk to health from dangerous gases, fumes, vapour or dust, or where there is likelihood of an oxygen deficiency in the atmospheres.

vi) Suitable gloves, apron and suits must be worn while handling corrosive and toxic chemicals

vii) All the person working within the GNFC's premises must wear suitable safety helmet.

viii) The persons must wear suitable safety belt or harness when working at heights where suitable and safe scaffolds ladders or other means of support cannot be provided. Every safety belt or harness shall be securely fixed to a secured anchorage or fitting to prevent serious injury in the event of a fall.

5.13 HOISTING / LIFTING EQUIPMENTS:

i) Use of hoisting machines and tackles including their attachment, anchorage and supports shall conform to the following standards or conditions

ii) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good condition and in good working order.

iii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.

iv) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine.

v) Use of crane with in the vicinity of electrical overhead lines shall be carried out in presence of Officer / Engineer-In-Charge.

vi) In case of every hoisting machine and of every chain, ring, hook, shackle, swivel and pulley block used in hoisting or lowering or as means of suspension, the safe working load shall be ascertained by adequate means.

vii) Every hoisting machine all gear referred above shall be plainly marked with the safe working load and the conditions under which it is applicable shall be clearly indicated.

viii) No part of any machine or any gear referred above shall be loaded beyond the safe working load except for the purpose of testing.

ix) Machines, Tools and Tackles used by contractors shall duly tested & certified (as per statutory requirement) and contractors, shall produce valid test certificates by competent person and whenever contractor bring any new machinery to the site of work contractor should notified the safe working load of the machine to the Officer / Engineer-In-Charge.

x) Motors, gearing, transmission, electrical wiring & other dangerous parts of hoisting appliances shall be provided with sufficient safe guard hoisting appliance should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions shall be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel. Such as gloves & boots as may be necessary shall be provided. The workers shall not wear any rings, watches & carry keys or other materials, which are good conductors of electricity.

xi) Don't tamper with any type of electric switches-equipment or any other appliances or moving machinery installed in factory area.

xii) Don't operate any switch, valve etc., without permission.

5.14 ELECTRICAL EQUIPMENTS:

All the workers of a contractor who is carrying out any kind of electrical work should have competency license for doing the electrical work,

All electric fixtures, cables, fittings, panels used shall be of good construction. No frayed wires/cables should be used. Adequate earthing / grounding should be ensured. No loose wires shall be allowed on portable equipments. All portable electric tools like machines shall be in good conditions, to avoid electric shock/ accidents. ELCBs / MCBs shall be used to avoid shocks/burns. Hand tools should be insulated properly. Protective equipments such as shock proof hand gloves, boots, mats etc. are necessary.

1. Electrical installation, equipments and cables used must be so designed, constructed, installed and maintained in accordance with the relevant safety & I.S. regulations.
2. Every temporary supply installation must be provided with a residual current device at the mains intake position to offer protection against earth leakage.
3. Every temporary supply installations must be provided with a circuit breaker or fuse etc of adequate capacity to provide protection against overload or short circuit.

4. Flexible cables for portable tools and hand lamps must be properly sheathed to withstand hard usage.
5. Hand lamps should have bulbs protected by suitable guards to prevent the accidental ignition of combustible materials by contact.
6. Trailing cables should be flexible and of adequate mechanical protection. They should be coiled up immediately after use. Suitable mechanical protection must be provided for trailing cables across any roads.
7. Every conductor used must be of sufficient size and current carrying capacity for the purpose for which it is intended to be used.
8. Electrical installations and equipment used with in the restricted areas must be an appropriate type and approved by the Officer / Engineer-In-Charge.
9. Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards.
10. Hoisting appliance should be provided with such means as will reduce to the minimum the risk of accidental descent of the load.
11. Adequate precautions shall be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.
12. When workers are employed on electrical installations; which are already energized; insulating mats, wearing apparel, such as gloves and boots as may be necessary shall be provided.
13. The workers working on electrical machines shall not wear any rings, watches and carry keys or other materials, which are good conductor of electricity.
14. Electrical equipment should be considered live unless it is ensured that they are isolated & made dead.
15. All the electrical equipments should be properly earthed as per Indian Electricity Rules.
16. Before commencing repairs on a machine main power supply to it should be cut-off & locked. Display cautionary tags on starting switches. Before you start make sure that everything is in the clear. Guards/covers should be put in position.
17. Any person without obtaining prior permission from the concerned supervisor should undertake no works on any machinery/equipment/piping.
18. It is prohibited to work on or near moving machinery by wearing loose clothing.
19. Nobody should try to clean, lubricate any part of the machinery while the machine is in running.
20. No electrical connection should be done without suitable fixtures such as plug pin, switchboard, ELCB, fuses etc.
21. Starting of any machines or power tools or turning on steam/power or gas should be done only after ensuring that nobody is in danger.

5.15 WELDING AND GAS CUTTING:

1. Before welding and cutting operations are to be carried out within the `Restricted Areas` of the GNFC's premises, safety permit must be obtained from the authorized person.
- 2 No welding or cutting operation should be undertaken on tanks, drums or other containers which contain or have contained dangerous/flammable substances unless such substances have been completely removed, the atmosphere inside being properly purged and there is no danger of fire, explosion or emission of toxic vapour.

3 Welding or cutting or any hot work operation should be performed away from any combustible materials. If the objects to be worked upon cannot be moved to a safe location, all combustible materials must be removed. If, possible, the irremovable combustible materials should be

properly covered up with flame-retardant blankets or metal sheets. The area of work should be thoroughly checked after work.

4 Suitable fire extinguishers must be kept readily available whilst the work is in progress.

5 Screen should be provided to protect neighboring workers and passers-by from glare or flying sparks.

6 The working area should be well ventilated to prevent the accumulation of toxic fumes and gases.

7 Suitable personal protective equipment such as helmet, goggles or face shield with correct filter glasses, gloves and aprons etc. must be worn.

8 In poorly ventilated area, suitable respirators should be worn to protect against any toxic fumes or gases, which may be produced.

9 Gas cylinder must be transported on a suitable trolley with in the plant. Rolling of cylinder is prohibited.

10 All welding machine sets electric or diesel, must be got inspected and approved by Officer / Engineer-In-Charge before use or before the job is to be undertaken.

11. Location of switchboards, junction box, connections and cable conditions must also be got inspected and approved by Officer / Engineer-In-Charge before use.

12 No welding/grinding/cutting/soldering or open flare/fire etc. should be done without valid safety permit issued by the Engineer-In-charge. While welding/grinding/cutting make sure that sparks & molten slag etc. don't fly or come into contact with combustible materials surrounding equipments, valves etc. i.e. make provision for collection of sparks.

13. Always keep gas cylinders away from direct rays of sun, hot place, and welding, grinding & cutting sparks.

14. Valves on cylinders should not be lubricated.

15. Gas cylinders should be kept away from work place & Acetylene cylinders should be kept vertical.

16. Cylinder should not be rolled on roads for transportation from stores or one place to another place, use suitable handcart for the purpose.

17. It is prohibited to carry gas cylinder up-stair in the plant or in-side the vessel or confined spaces for cutting-welding job.

18. Welding cables & connections should be in good condition & fix the earthing cables at the welding place only.

5.16

RADIOGRAPHY:

- All operations involving the use of radio active substances shall be supervised by the contractor to ensure that protective measures are properly maintained and to check the extent of protection afforded in practice STORAGE

- All radioactive substances not in use shall be kept securely in a dedicated store. The storage place should be clearly marked with the warning sign and the wording "DANGER – RADIO ACTIVE MATERIAL" in clear and indelible print. Its access hatch or door should be provided with a lock, the keys of which should be kept by the authorized radiographer.

- Only authorized personnel should introduce into, or remove them from, the store. HANDLING PROCEDURE AND PERSONAL PROTECTION

The three golden rules are

- keep maximum distance from the source
- provide maximum shielding
- keep exposure time down

GUIDELINES

- A radiography permit shall be obtained on each occasion radiological work is carried out.
- Sources must be stored in safe containers so constructed that the level of radiation at the boundary limit of 10 feet shall not exceed 0.75 milliR per hour in air.
- Suitable warning notices for display at barriers shall have the wording "RADIATION DO NOT ENTER" in Gujarati and English. The notices shall also include the radiation symbol.
- All persons using radioactive substances shall be trained and certified in the use of such substances
- The perimeter of the area shall be patrolled during the period of source exposure.
- The exposure source must be immediately returned to its safe container on the request of operating personnel, or in the event of a fire or other emergency occurring.
- Any worker liable to be exposed to ionizing radiation shall wear on the appropriate part of his body a film badge to measure the amount of radiation accumulated.
- Persons regularly employed on work involving exposure to ionizing radiation, shall be medically examined at the commencement of such employment and thereafter at monthly intervals. No person under 18 years of age shall be so employed.

5.17 HAND TOOLS GENERAL RULES

Select the right tools for the job

Inspect the tool and ensure that it is in good condition and keep it in good condition. Unsafe tools include wrenches with cracked or worn jaws, screwdrivers with broken tips, or split or broken handles, hammers with chipped, mushroomed or loose heads and broken or split handles, mushroomed heads on chisel, dull saws and extension cords or electrical tools with broken plugs improper or removed grounding systems or split insulation.

- Use tools correctly.
- Keep tools in safe place.
- Train your workers to select the right tools for each job, and ensure that the tools are available.
- Carry the tools to and from the work site in a tool box, cabinet, or other appropriate tool holder or pouch.
- Store the tools in the proper storage area.
- Tools should not be carried up or down ladders by hand, appropriate pounces shall be use.
- Tools should not be thrown from one level to another, nor should they be thrown from one location to another on same level.
- Tools should not kept lying on the floor, on the scaffold, walkways or cluttering work benches.
- Spark proof tools should be inspected regularly to ensure that there are no steel splinters.
- Power tools should be inspected regularly to ensure that there are no steel splinters.

- Power tools should be inspected tested and used, in accordance with the manufacturer's instruction.
- Power tool should be provided with fail safe device which renders the tool inoperative when the operator releases his hold.
- Only trained and authorized persons shall use power tools.
- Where the guards are required they shall be securely fitted and correctly adjusted.
- A loaded tool shall be left unattended.
- Ensure the use of proper protective clothing and equipment
- Plan the job well in advance.

5.18 FIRE PREVENTION:

All contractors must observe the following fire prevention measures:

- Fire escape routes and exits must be kept unobstructed at all the times.
- All fire fighting equipment and protection equipment must be free from obstruction.
- No person shall tamper with or impair any fire fighting equipment and protection equipment.
- Readily combustible materials such as oil rags should be removed as soon as practicable or deposited in a metal container with cover.
- Contractor personnel should familiarize with the GNFC's fire alarm and emergency evacuation procedure.
- Before leaving the work sites, the contractor must ensure that naked lights and other ignition sources have been extinguished and electrical equipment switched off.
- All flammable liquid must be kept in securely close cans or metal drums on which the contents are clearly marked. Empty drums/containers must be removed from work sites as soon as practicable.
- Appropriate flame traps must be fitted to exhaust pipes of any vehicle or diesel engine if they located with the restricted areas. Hot works like welding/ cutting/ grinding shall be carried out in such a way that no fire/ explosion incident takes place. Gas cylinders shall be handled safety, avoiding heat/ sparks/ flame on them. Combustible materials, bags and other things shall be kept away and cleaned immediately. House keeping should be maintained in good condition. Sparks/ metal slag shall be collected in asbestos cloth. Fire extinguishers/ water hoses shall be kept ready. Don't carry cylinders into tanks, vessels, and confined spaces. Hot work on pipe lines, vessels, equipments etc. should not be started without testing presence of any gas and obtain valid hot work permit.

5.19 IN CASE OF EMERGENCY

Role of Contractors / ContractorsSupervisor's / Contractor's workers In case of Emergency.

1. It is essential for Contractors and their Supervisors to know the actions to be taken in case of emergency situation like fire/ toxic gas release/ explosion/ acid leakage etc. They should also inform their workers for the actions to be taken.
2. Instruct all workers to evacuate affected areas and go to safe assembly points/ locations, if advised by the Shift Engineer/ Operator or any authorized person.
3. Provide any assistance if asked by the area In-charge.
4. If instructed by Company Supervisor/ Contractor's Supervisor evacuate affected area and go to safe assembly points/ locations immediately.
5. Workers should never rush towards incident side by curiosity or as a Spectator.
6. Contractor personnel should familiarize with the GNFC's fire alarm and emergency evacuation procedures.
7. In case of fire or emergency or blowing of emergency siren, all contract Persons, except those involved in fire fighting or rescue work should go and stay at nearest marked Emergency Assembly Point.
8. All hot works being carried out in the plant shall be stopped immediately in the event of emergency.