

Government Of West Bengal Office Of The Divisional Fire Officer, Paschim Medinipur West Bengal Fire & Emergency Services Sepoy Bazar, P.O.:- Medinipur, P.S.:- Kotwali, Pin:- 721101

Memo no.:FSR/0125186231500252

Date: 17-10-2023

From: Divisional Fire Officer, Paschim Medinipur West Bengal Fire & Emergency Services

To: MAGPET POLYMERS PRIVATE LIMITED (UNIT III) VIDYASAGAR INDUSTRIAL PARK, PLOT-A7, NH-60, VILL.- RUPNARAYANPUR, P.O.-JAKPUR, P.S.- KHARAGPUR LOCAL, PASCHIM MEDINIPUR. PIN- 721301

Sub: Fire Safety Recommendation for Proposed construction consisting of Work Shop with G.I. Sheet, Admin Building Single Storey, Fuel Storage with G.I. Sheet, Hot Water Generator with G.I. Sheet, Electrical Room with RCC Roofing, Labour Rest House with RCC Roofing, Security Room with RCC Roofing of "MAGPET PULYMERS PVT. LTD. (UNIT- III)" under group of Industrial Building situated at Plot No.- A7, Vidyasagar Industrial Park, NH-60, Village- Rupnarayanpur, PO- Jakpur, PS- Kharagpur Local, District- Paschim Medinipur- 721301.

This is in reference to your application no. 0125186231500252 dated 21-08-2023 regarding the Fire Safety Recommendation for Proposed construction consisting of Work Shop with G.I. Sheet, Admin Building Single Storey, Fuel Storage with G.I. Sheet, Hot Water Generator with G.I. Sheet, Electrical Room with RCC Roofing, Labour Rest House with RCC Roofing, Security Room with RCC Roofing of "MAGPET PULYMERS PVT. LTD. (UNIT- III)" under group of Industrial Building situated at Plot No.- A7, Vidyasagar Industrial Park, NH-60, Village- Rupnarayanpur, PO- Jakpur, PS- Kharagpur Local, District- Paschim Medinipur-721301.

The plan submitted by you was scrutinized and marked as found necessary from Fire Safety point of view. In returning one set of plan with recommendation, this is issuing Fire Safety Recommendation in favor of the aforesaid building subject to the compliance of the following fire safety measure.

# Recommendation:

CONSTRUCTION:

1. The whole construction of the existing industry shall be carried out as per approved plan drawings conforming the relevant industry rules of local Municipality/Panchayat Body.

2.Construction and layout of the industry shall remain same as per approved plan and shall never be altered in any part of the industry except marked portion.

3. Material for rapid flame spread categories including untreated wood, fibred board etc. shall be not used. The doors and windows preferably shall be made of metal.

4. The floor area exceeds 750 m2 shall be suitably compartmented by separation walls up to ceiling level having two hours fire resisting capacity.

5. The floor area having more than 5000 SqMt. shall be suitably compartmented for every 5000 SQM by separation wall up to ceiling level having at least two hours Fire resisting capacity as per N.B.C Part- 4 2016.

6.Suitable gang way connecting all the means of egress / escape route shall be provided and marked suitably for easy evacuation.

7.All the marked construction should be done with proper fire rating things.

8. High risk areas of the factory like kitchen, Boiler Room, Heater Control Rooms, Sub Station, Laboratories, Pharmacies, Main Warehouses (HDPE,LLDPE,PP), Extruders Buildings, Stores and Works Shops etc. should be separated from other parts of the building by fire resisting wall.

9. Suitable Ventilation using ridge/ natural ventilation and mechanical ventilation if required shall be provided. Different material shall be suitably segregated as per their hazard category.

10. Suitable rack sprinkler shall be provided in the storage racks as per standard norms /guidelines. Air Sampling Smoke Detection (VESDA) System integrated with FAP to be provided

11.All the marked construction should be done with proper fire rating things.

12. Fire rating test certificate of all constructional materials of the industry should be submitted to this department before taking Fire Safety Certificate.

13. Areas of high risk of the industry like kitchen, Main store and Engineering department should be separated from other parts of the industry by the fire resisting wall.

14.All the marked construction should be done as soon as possible otherwise this should be treated as cancelled.

15. The interior finish decoration of the industry shall be made low flame spread materials conforming I.S. specifications.

16. Provision of ventilation at the crown of the central core-duct of the industry shall be provided.

17. Arrangement shall have to be made for sealing all the vertical and horizontal ducts by the materials of adequate fire resisting capacity.

# OPEN SPACE AND APPROACH:

1. The open spaces surrounding the industry shall conform the relevant industry rules as well as permit the accessibility and maneuverability of Fire Appliances with turning facility.

2. The occupant load of each storey industry is 10 m2/person in such category of industry.

3. The approach roads shall be sufficiently strong to withstand the load of Fire Engine weighting 45M.T.

4. The width and height of the access gate into the premises shall not be less than 4.5 mts. and 5.0 mts. respecting the abutting road.

5.Drive way/internal roads should be free from any type of obstruction. No parking will be allowed on the drive way.

6.All the Passage way should be kept clear for free access.

# STAIRCASE: if anv <

1. The staircase of the industry shall be enclosed type. Entire construction shall be made of bricks/R.C.C. type having Fire Resisting capacity not less than 4 hours.

2. The staircase of the industry shall have permanent vents at the top and open able sashes at each floor level in the external walls of the industry.

3. The width of the staircase shall be made as marked in the pan. Corridors and the exit doors shall conform the relevant Industry Rules with up-to-date amendment.

4.All the staircase shall be extended up to terrace of the building and shall be negotiated to each floor.

# EXIT:

1.Exit should be so arranged that at least two separate exits are available in area.

2. Every exitpassageway and exit discharge shall be continuously maintained free of all obstructions or impediments to full use in the case of fire or other emergency.

3. In every industry exit shall comply the minimum requirements of this part for general public use.

4. Free access and movement of fire vehicles shall confirm through-out the premises.

5.Exit shall be as remote from each other as practicable and so arranged that there are no

6.Pockets or dead end occurred in which occupants may be trapped.

7. Every exit door way shall be open into a horizontal exit of corridor.

8.Exit width will as be mentioned in the N.B.C. Part-IV.

9.Workshop, warehouse, Compartmentation shall be made for each 750 Sq. Meters of floor areas and natural draft smoke venting shall utilize roof vents or vents in walls at or near the ceiling level. Such vents shall be normally open. or, if closed, shall be designed for automatic opening in case of fire, by release of smoke sensitive devices. The Stack or Pile height and disposition inside the Workshop shall not be more than 5 (Five) Meters in any time and strictly in accordance with the N.B.C. of India 2016.

#### LIFT: (if any)

1. The walls of the lift enclosure shall be at least two hours Fire Resisting type.

2.Collapsible gate shall not be permitted.

3.One of the lift shall be designed for Fire Lift. The word "FIRE LIFT" shall conspicuously written at ground floor. 4.Lift and Lift Lobby shall be communicated to the basement and shall have to be pressurized as per guide line of N.B.C. part-IV, Annexure 'C'.

#### MEANS OF ESCAPE

1.All emergency exists shall be free access and without any obstructions 2. Time of evacuation should be as per IS: 1644-1988.

# FIRE COMMAND CENTRE (FCC):

1. The control room shall have the main fire alarm panel with communication system (suitable public address system) to aid floors and facilities for receiving the message from different floors.

2. Fire command center shall be constructed with 120 min rating walls with a fire door and shall be provided with emergency lighting. Interior finishes shall not use any flammable materials. All controls and monitoring of fire alarm systems, smoke management systems shall happen from this room. Monitoring of integrated industry management systems, CCTVs or any other critical parameters in industry may also be from the same room. Details of all floor plans along with the details of firefighting equipment and installations (2 sets laminated and bound) shall be maintained in fire command centre. The fire staff in charge of the fire command center shall also be responsible for the maintenance of the various services and firefighting equipment and installations in coordination with security, electrical and civil staff of the industry.

# FIRE PUMP:

1. Provision of the Fire Pump shall have to be made to supply water at the rate-designed pressure and discharge min. 2850 LPM however the exact discharge may be fixed as per the water demand calculation considering 3 hours of water supply for extinguishing major contingency fire, which shall be installed in the industry.

2.Same capacity Separate Sprinkler Fire pump shall have to be provided for covering total Sprinkler & water curtain Installation of the industry.

3. Provision of one pump shall always be kept on stand-by (preferably be of diesel driven type) keeping into consideration of the water demand and the absence of the main pump.

4. Provision of Jockey Pump capable to discharge 450lts/min shall also have to be made to keep the Water based system under pressurized condition at all the time.

5. Firewater pumps shall be located as far away as possible (not less than 60 M) from hazardous areas to avoid any damage in case of fire/explosion.

6.All the pumps shall be incorporated with both manual and auto starting facilities. The suction of pumps shall preferably of positive type or in case of negative suction the system shall be wet riser-cum-down comer with suitable terrace pump with overhead tank.

# FIRE FIGHTING WATER:

1.One underground fire water reservoir (As per 5.1.2.1 of the National Industry Code of India, Part IV 2016) of 1,50,000 liters capacity with adequately good and alternative replenishment facilities for all the reservoirs shall be provided to facilitate and incorporate the Water Based Fixed Fire Fighting System.

2.For all risk coming under high hazards category and with single unobstructed floor area not exceeding 1000 SQM, it shall have water storage for firefighting equivalent to 3 hours pumping capacity minimum, when using 6 strong jets simultaneously – each jet consuming 600 LPM. Where the area exceeds 1000 SQM, additional quantity at the rate of 50 percent of above shall be provided subject to a minimum of 4 hours pumping capacity as per I.S. 9668

3.Based on the site requirement, water shall be used for fire extinguishment, fire control, cooling of equipment andprotection of equipment as well aspersonnel from heat radiation. For these purposes water in appropriate form should be used such as straight jet, waterfog, water mist, water curtain, water spray, deluge/ sprinkler, for foam making etc. Firewater system shall comprise of fire water storage, firewater pumps and distribution piping network along with hydrants and monitors, as the main components.

4.Water reservoir arrangement shall be made in such a way so the fire-fighting work shall be executed for at least 4 hours.

# WATER LAYOUT SYSTEM:

1.150 mm. ring main water layout arrangement covering the entire premises of the project with provision of pillar type hydrant with door boxes containing two lengths of 63 mm Delivery hoses and short Branches to be provided at all strategic location and surrounding the area conforming I.S. 3844 – 1989 up to date amendment and T.A.C.

2. The system shall be so designed that shall be kept charged with water all the time under pressure and capable to discharge not less than 2850 ltrs /min. at the pressure of 3.5 Kg/sq.cm. at furthermost point. All the requirements of the water base fire protection system shall be made as per I.S. specification 3844-1989 with up to date amendment. 3. All the hydrants should be double headed type.

4. Hose reel hose along with landing valve should be provided all over the industryin floor at ground level.

5. The layout system should consist not less than 150 mm. loop around the power block. The location of fire main isolation valve should be arranged such that any section of the loop can be isolated without impairing fire protection system.

6.The hydrant should be provided at least 12 mtrs. fromindustry/structure and should be spaced so that any industry or structure can be reached with a 75 mtrs. maximum radius. Separate pipe line should be made for riser and sprinkler system.

7. Provision for Hose Reel in conjunction with Wet Riser shall be made at each floor level and conforming the relevant I.S. Specifications.

# SPRINKLER INSTALLATION:

1. The automatic sprinkler shall be provided in manufacturing unit (where applicable), stores, shed areas of the industry as per I.S. 9972. & 15105. If any unit/warehouse/storage area exceeds 750 m2 shall be suitably compartmented by separation walls up to ceiling level having two hours fire resisting capacity. Alarm Gong to be incorporated along with the sprinkler system.

2.A system of waterpipes fitted with sprinkler heads at suitable intervalsand heights and designed to actuate automatically, control and extinguish a fire by the discharge of water.

3. The pipingsystem is connected to the water supply through anautomatically actuated deluge valve which initiates flowof water. Automatic actuation is achieved by operation f automatic detecting equipment installed along with water spray nozzles.

4. Workshop Compartmentation can be achieved, with fire barrier or with water curtain nozzle (K-23) or with combination thereof. Automatic deluge system comprising deluge valve, piping, nozzles, etc shall be used to zone the compartment in case of water curtain system. In case of water curtain, existing water storage shall be supplemented by water demand for water curtain nozzles for 60 min considering the largest compartments perimeter out of all compartments of car parking in any of the basements.

5. The water supply for the water curtain nozzles shall be through independent electric pump of adequate capacity (flow and head) with piping/riser for the water supply to the nozzles.

6. The water curtain shall be operated by the actuation of flow switch actuating sprinkler system.

# ELECTRICAL INSTALLATION AND DISTRIBUTION

1. The electrical installation including Transformers, Switch Gear, Main & Meters etc. and the distribution system of the premises shall be made satisfying the code of practice for Fire Safety in general industry as laid down in I.S. specification 1946-1982.

2. The vertical and horizontal electrical ducts shall be sealed at each floor level by fir resisting materials.

3. The electrical installation shall be adequately protected with CO2/D.C.P.

4. Arrangement for alternative power supply shall have to be made to supply power with the help of a generator to operator at least the Fire Pump, Deep Tube-Well Pump, Fire Alarm System etc. and also for illuminating the Staircase, Corridors, Lobbies etc. and other places of assembly of the industry in case of normal power failure.

5. The electrical installation including transformers, switch gears, main & meters etc. and the distribution system of the premises shall be made satisfying the code of practice for Fire Safety in general building as laid down in I.S specifications 1946 - 1982.

6.Transformer should be protected with Nitrogen Injector (NIDS) or High Velocity water spray system.

7.All control gears shall be protected against rodents, reptiles and insects.

8. The entrance to the sub-station room shall be provided with fire resisting door of two hours fire rating a curb (sill) of a suitable height shall be provided at the entrance in order to prevent the flow of oil from ruptured transformer into other part. 9. The structural elements of sub-station shall be type-I of construction complying with the requirements as given in I.S. 1642-1989.

10.Switch gear wherever applicable, oil-circuit breakers and transformers shall be housed preferably in detached single Storey building of type-I construction (See IS 1642-1989).

11.Cables shall be clamped immediately below floor level. Each cable or group shall where

12.possible be protected by pipe cover of heat resisting material rising to height of at least 45 cm above floor level or terminating just below cable gland, sealed at the bottom and filled with sand or small pebbles.

13.13. Where cable rest on the floor of tunnel or basement they shall be separated into groups

by vertical barriers of tile brick or concrete and the tranches so far shall be filled with small pebbles. Alternatively, the cable may be separately clamped and each run shall be separated by a minimum clear space of 75 mm.

14. The cable shall not be routed near hot space where it is unavoidable fire resistance cable shall be used.

15.Lightening arrester shall be provided inside the premises.

16.Power cable and control cable shall run in separate trenches wherever possible.

17. For an enclosed switch gear room automatic CO2 total flooding extinguishing system is to be provided, switch gear room shall be provided with controllable ventilators.

18.All cable entries in the switch gear room shall be effectively sealed by use of fire stops as per I.S. 12459-1988.

19.All switch gear room shall be kept clear and free from any accumulated debris or flammable materials.

20. Fixed automatic gaseous extinguishing of local application type shall be ideal in switch gear system.

21. The control room shall have 02 hours fire resistance with smoke stop check doors of the same sating.

22.All cable entries /openings in the control room shall be effectively sealed.

23.The A.C system shall be automatically switched off before the extinguishing system is put into operation.

24. Smoke detectors of ionization and optical types shall be provided in the control room or cross zoning principle with suitable time delay devices incorporated.

25. The cable shall not be routed near hot space where it is unavoidable fire resistance cable shall be used.

26.Lightening arrester shall be provided inside the premises.

27. Power cable and control cable shall run in separate trenches wherever possible.

28.For an enclosed switch gear room automatic CO2 total flooding extinguishing system is to be provided, switch gear room shall be provided with controllable ventilators.

29.All cable entries in the switch gear room shall be effectively sealed by use of fire stops as per I.S. 12459-1988.

30.All switch gear room shall be kept clear and free from any accumulated debris or flammable materials.

31. Fixed automatic gaseous extinguishing of local application type shall be ideal in switch gear system.

32. The control room shall have 02 hours fire resistance with smoke stop check doors of the same sating.

33.All cable entries /openings in the control room shall be effectively sealed.

34. The A.C system shall be automatically switched off before the extinguishing system is put into operation.

35.Smoke detectors of ionization and optical types shall be provided in the control room or cross zoning principle with suitable time delay devices incorporated.

36.On and Off type sprinkler system shall be provided in control room if possible.

# ALTERNATIVE POWER SUPPLY

Arrangement for alternative power supply shall have to be made to supply power with the help of a generator to operate at least the Fire Pump, Deep Tube-Well Pump, Fire Alarm System etc. and also for illuminating the Staircase, Corridors, Lobbies etc. and other places of assembly of the industry in case of normal power failure.

DETECTION AND ALARM SYSTEM: (followed by later points)

1.Auto Fire Alarm System with Analogue Addressable Smoke /Heat Detectors as per suitability shall be installed in each floor and roof.

2.Manually operated Electrical Fire Alarm System with Hooters along with Public Address System at each floor connecting with visual panel board shall be made in Control Room.

3. The Control Room shall be located at entrance of ground floor of the industry, other requirements of the system shall be made conforming I.S. 2189-1988.

4.Auto Fire Detection System with the help of Heat and Smoke Detectors shall be installed in al places of below and preferably above false ceiling of the industry. The system shall also be made in place of rooms where valuable articles have been kept. The other requirements of the system shall be made in accordance with I.S. 2189-1988.

5. The suppression system shall be made with Fire Extinguishers and total flooding system with CO2/F.M.-200 particularly in Computer, Electrical processing and Data Room and in all rooms of irreplaceable articles.

6.Hooters will be sounded in such a manner so that an operation of a Detectors or Manual Call Point. Hooters will be sounded on the same floor and immediate alternate floor.

7.Public Address System linked between all floors and Control Room shall have to be established.

#### WORK PLACE:

1. Accumulation of waste combustible materials such as paper and wood should not be dumped at the workplace and collected in designated containers.

2. Combustible materials in trash containers should be covered and emptied on regularly intervals.

3. Leakage or spillage of flammable materials like oil, grease & flammable liquid near ignition sources/heat surfaces shall be checked regularly & if found shall be attained promptly.

4. Maintain free access to all Electrical Control points.

5. Chemicals should be stored safely and have proper labels. Material Safety Data Sheet (MSDS) should be provided at the site within the vicinity.

# PLANT SAFETY:

By adopting proper safety measures in advance, much can be done to forestall fire and explosions and to limit the effects. Plant is to be designed to prevent the escape of flammable gases/liquids or dusts. They can be instrumented to give warning of rise in temperature, liquid level or pressure. Other instruments can be used to detect leaks, excess flow or stoppage of flow in pipelines and cooling coils. Explosive meters can be used to detect dangerous concentration of flammable vapor's. Fail-safe and interlocking processes can be arranged so that before a critical operation is started up, certain safeguarding operations are already in progress, e.g. plants may be designed not to operate until the ventilation has been functioning for a specified time.

Relief of explosion or over-pressure can be designed and employed to prevent damage to the plant and industry (0.09 Sq/m. of vent area for every 0.56m3 of the plant, i.e. 1Sq./ft of vent area for every 20 Cu./ft of the plant). The explosion relief should be so positioned as to vent the explosion products into a safe place so that life and property are not endangered.

# BOILER/STOVE OVENS : (if any)

1. Prohibit smoking and the use of open flames in the vicinity of the plant. Warning notices are to be prominently displayed at conspicuous Position. "DANGER - NO SMOKING".

2. All electrical fittings and lines should complied with the regulations of National electrical code.

3. Install correctly design electrical equipment's and apparatus as specified in the IS: 1646-1961, such as spark proof, flame proof, dust proof, intrinsically safe apparatus.

4. Ensure proper ventilation especially in the indoor areas.

5. Provide separate bund walls for each tank of the byproduct having a capacity of 10% greater than the capacity of the tank, with the drainage facilities of the escaping liquids to a safe position.

6. Avoid accumulation of by products in the open surface drain. Drainage system of the plant should be of approved design, free from obstructions and need to be flashed regularly.

7. Avoid prolong storage of coal (not more than 3 weeks) in the coal handling beds to avoid possibilities of the chance of spontaneous combustion. 8. Require good housekeeping proper maintenance and correct operation of the plant.

# GANTRY CRANES:

1. The control circuit voltage shall not exceed 600 volts for AC or DC.

2. Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact under

normal operating conditions.

- 3. Electric equipment shall be protected from dirt, grease, oil, and moisture.
- 4. Oil cans, oil soaked jute, extra fuses, and other articles shall not be permitted to store in cranes.
- 5. Over filling of oil in reducers shall be avoided.
- 6.Leakages from reducer shall be arrested.
- 7. Housekeeping in cranes shall be of high standard.
- 8. 4.0 kg Dry Chemical (BC Type) Powder Portable Fire Extinguishers as per IS: 15683

shall be provided in Operator's cabin of Gantry Crane.

# FURNACE: (if any)

1. Smoking should be prohibited in the area of mains, fuel storages, fuel gas storages, fuel oil injection areas, coal storages, oil cellars, electrical rooms, oxygen plant Acetylene plant and consuming plants, stores, sub stores, parking area where inflammable materials like wood, paper are stored.

2. 'No Smoking signs painted in large readable letters on a contrasting background should be displayed conspicuous in one or more areas. Each sign should have a photograph. Lighting of matches in darkness in the area should be prohibited. Fluorescent paint should be used to signify the prohibited area.

3. Welding by electric or gas should be permitted in the no smoking areas unless a safety protocol is made taking all precautionary measures and should be done under proper supervision.

4. Fire Check doors should be provided in the oil cellars, control rooms, instrumentation

Racks, service tunnels to check the spread of fire. Such doors shall meet the requirements as laid down in IS: 3614 (Part 1)-1966. ventilation resulting in the ignition or rise in

5. Loose electrical connections and improper temperature should be checked.

6. Spillage of any lubricants, fuel oil, inflammable materials should be cleared by spraying sand and clearing the surface.

7. No loose wires or temporary wire connections should be permitted in the control rooms, oil cellars, cable tunnels service tunnels etc.

8. No wooden door or window should be provided in the control room, instrumentation rooms, oil cellars, cable tunnels service tunnels etc.

9. All partitions should be of steel frame and wood wool board or non-combustible sheets. No wooden partition is permitted within the plant premises. 10. Waste cotton should be disposed of in the bins filled with half water so that the cotton is damp and will not catch fire.

11. Where considerable amount of combustible materials are stored cordoning off the area and adequate provision to supervise the area by installing monitors should be made.

12. Any electrical defect or any leakage in the gas mains or leakage of any oils should be checked and rectified immediately. Suitable gas detectors should be installed.

# FLAMABLE STORAGE TANK: (if any)

- 1. Warningsignage's and MSDS shall be displayed.
- 2. Tank level indicator and capacity of tank should be mention.
- 3. Fire Hydrant should have adequate pressure and should be accessible.
- 4. Spill control measures should be in place.
- 5. Standard Operating Procedure (SOP) for loading and unloading of oil and emergency preparedness should be in place.
- 6. Combustible Flammable materials should not be stored at near by tank area.
- 7. Electrical fittings should be flame proof.
- 8. Ensure proper earthing & bonding.

# COAL YARDS:(if any)

- 1.Coal to be stacked up to a maximum height of 15 Mt.
- 2. Stacking to be done in trapezoidal stock pile.
- 3. Temperature monitoring of the pile to be done.
- 4. Hot spots above 700C shall be removed.
- 5. Coal piles shall be segregated from other area.
- 6. Coal screening, crushing and other operation shall be done in well-ventilated area.
- 7. Storage shall be limited for short duration.
- 8. Housekeeping shall be of high standard.
- 9. Smoking shall be prohibited.

#### AUTO DETECTION AND SUPRESSION SYSTEM:

1.Auto Fire Alarm System with Analogue Addressable Smoke /Heat Detectors as per suitability shall be installed entire work places of the industry.

2.Addressable analogue manual call boxes incorporating with sounders shall be installed in all the areas of the industry shed in such a manner that maximum travel distance shall not be more than 22.5 mtrs. in order to reach at any call point. 3. Micro Processor based Fire Alarm Panel shall be installed and all shall also be connected with main panel at the Fire Control Room of the premises having direct dialing facility to the local Fire services unit.

4. Public Address Systems shall be made available in the all industry premises. The system shall be connected to the main Control Room.

5.MCP along with Hooter should be provided in the industry, Hooter will be so arranged so that sound can be hear from any corner of the industry.

6.All the conveyer belt should be provided with proper Detection and Suppression system.

7.All the installations shall also be satisfy the I.S. specifications 2189 (as amended) and the code of practice as laid down in the N.B.C. Part- IV.

# AIR CONDITIONING SYSTEM (If centralized A.C. is there):

1. The A.H.U. shall be separated for each floor with the system. Air Ducts for individual floors.

2.Arrangement shall be made for isolation at the strategic locations by incorporating auto dampers in the Air Conditioning System.

3. The system of auto shut down of A.H.U. shall be incorporated with the Auto Detection and Alarm System.

4. The Air Handling Units room shall not be used for storage of any combustible materials.

5.Escape routes like staircase, common corridors, lift lobbies etc. shall not be used as return air passage.

6.Wherever the ducts pass through fire walls of floors, the opening around the ducts shall be sealed with fire resisting materials such as asbestos rope vermiculite concrete etc.

7.As far as possible metallic ducts shall be used even for the return air instead of space above the false ceiling.

8. The materials used for insulating the ducts system (inside or outside) shall be of non-combustible materials glass wool shall not be wrapped or secured by any materials of combustible nature.

9. Area more than 750 sq. m. on individual floor shall be segregated by a fir wall and automatic fire dampers for isolation shall be provided.

10.Air ducts serving main floor area, corridors etc. shall not pass through the staircase enclosure.

11. The Air Handling Units shall be separated and in no way interconnected with the ducting of any other floor.

12.If the Air Handling Units serve more than one floor, the recommendation given above shall be complied with in addition to the conditions given below:-

a)Proper arrangements by way of automatic fire dampers working on fusible links for isolating all ducting at every floor from the main riser shall be made.

b)When the automatic fire alarm operates the respective Air Handling Units of the air conditioning system shall automatically be switch off.

13. The vertical shaft for treated fresh air shall be of masonry construction.

14. The air filters for Air Handling Units shall be of non-combustible materials.

15.Inspection panel shall be provided in the main trucking facilitate the cleaning of ducts of accumulated dust and to obtain access for maintenance of fire dampers.

16.No combustible materials shall be fixed near than 15 cm. to any ducts unless such duct is properly enclosed and protected with non-combustible materials (glass wool or spun wool with neoprene facing enclosed and wrapped with Aluminum sheeting ) at least 3.2 cm. thick and which would not readily conduct heat.

# FIRST AID FIRE FIGHTING SYSTEM:

First Aid Fire Fighting arrangement in the style of portable Fire Extinguishers, Fire Buckets etc. in all floors and vulnerable locations of the premises shall be made in accordance with I.S. 2190-1992.

#### TRANSFORMER PROTECTION:

3.Transformer to be protected H.V. Water projector system / Modular (DCP) base should be filled up by stone, the flow of oil.

4.Entry of unauthorized person should be restricted inside the transformer area.

5. Dykes to be provided to contained the oil of the transformer in case of leakage.

6.It is strongly recommended that any oil – insulated outdoor type transformer containing 2250 ltrs. or more oil is to be separated from nearby structure by two hours rated fire wall or by specific spatial separation in accordance with NFPA-850 recommendations.

7.Wherever a firewall is installed between transformer it should be extended at least 300 mm above the top the transformer shall and oil tank at least 600 mm. beyond the width of the transformer and cooling radiator.

8.Dry type transformer is strongly preferred for use inside industry. In case however an oil insulated transformer is installed indoors, then it is oil content exceeds 450 ltrs. than it should be separated from nearby areas by a fire barrier of three hours fire resistance rating. In resistance of the fire barrier reduced to one hour.

# GODOWN & WAREHOUSE;

- 1. Statutory warning notice to be displayed in the conspicuous place.
- 2.Proper and methodical system to be made.
- 3.Passageway and aisles to be provided between stack of storage at reasonable intervals.
- 4. The stack height under no circumstances exceeds 4.5m.
- 5. Proper ventilation shall be made by sky lights monitors or hatches @0.3 sq.mtrs. for every 15sq.mtrs. of floor area.
- 6. The passageways or aisles should be so spaced that the total content of the individual stack shall not exceed 500 M2
- 7.Haphazard indoor or outdoor storage shall be avoided.
- 8.Keep storage areas dry, clean and well ventilated
- 9.Ensure high housekeeping standards and avoid spillage.
- 10.Remove weeds in the compound regularly.
- 11.Inspect godown premises thoroughly before it is closed.
- 12. Follow hot work permit instructions when wielding/cutting.
- 13.All switches and control equipment shall be located outside godown.
- 14.All electrical fittings shall be spark proof

15. Provide emergency lighting for fire exits.

LIGHTNING PROTECTION OF INDUSTRYS: - Routing of down conductors (insulated or un-insulated) of lightning protection through electrical or other service shafts are not allowed as it can create fire and explosion during lightning. For details, see Part 8 Industry Services, Section 2 Electrical and Allied Installations of the National Industry Code.

ESCAPE LIGHTING AND EXIT SIGNAGE EXIT ACCESS:- Exits and exit discharge shall be properly identified, with adequate lighting maintained in the elements of the egress systems so that all occupants shall be able to leave the facility safely.

10252

HIGH TENSION LIGHT- The safety distance of the 220 kV substations is 10 meters.

#### GENERAL RECOMMENDATIONS:

1. The requirements of open space around the industry(s) and the comparative floor area ratios for different Occupancies and types of construction shall be in accordance with Part 3 Development Control Rules and General Industry Requirements of the amended National Industry Code of India. Compartmentation shall be made with every 750 Square Meters of Floor Areas. The Industry Shall Conform Strictly the following Standards/specifications: - I.S. 659:1964. I.S. 1641:1988. I.S. 1642:1989, I.S. 1646:1982 I.S. 2189:1988, I.S. 2190:1979, I.S. 3614 (Part 1):1966, I.S. 9668:1980 and I.S. 3594:1991 in respect of this High Hazard Industrial Occupancy or part of the same, any structure for whatsoever purpose and of whatsoever materials constructed and any part thereof whether used as human habitation or not and includes foundation, plinth. walls, floors. roofs, chimneys, plumbing and industry services, fixed platform, varanda, balcony. cornice or projection, part of industry or anything affixed thereto or any wall enclosing or intended to enclose any land or space and signs and outdoor display structures shall not be more than 15 Meters of height.

2. Fire separating walls shall be provided between two industrys or between two blocks inside aindustry, having different fire hazards in accordance with the provisions of this Part. The areas having storage, manufacturing, hazardous activities such as paint store, oil storage, spray booths, etc, shall be separated from non-hazardous areas like administrative office, staff canteen, etc by fire rated walls/doors of 120 min fire resistance rating. The fire resistance rating of high hazardous areas like petrochemical, explosives shall be 240 min. The fire separating wall where provided shall comply with the following requirements:

3. The separating wall shall be carried through the roof. This portion of the wall extending above the roof. known as .screen wall. Shall be of such a height (in no case less than 600 mm) that the horizontal distance at the level of the top of the screen wall between the roofs of the industry's/compartments being segregated is at least 6 m.

4. The screen wall shall be of not less than 230 mm in thickness if it is an extension of a masonry wall, and not less than 150 mm in thickness if it is an extension of a reinforced concrete wall.

5. The separating wall need not be extended as a screen wall if the roof of one or both of the industry's/blocks being segregated is of reinforced concrete construction (RCC).

6.In the case of industries of unequal height, windows or other openings in the wall of the higher industry overlooking the roof of the lower industry and within 6 m, thereof, shall be protected by fire resistant glass assembly or by approved type fire doors unless the roof of the lower industry is of reinforced concrete.

7.In case the eaves of the higher industry fall within 6 m of the roof of the lower industry such eaves should be cut-off and the screen wall raised as a parapet. 600 mm high over the roof of the higher industry, unless the roof of the lower industry is of RCC construction.

8. Fire separating walls shall also be extended outwards on both sides by at least 450 mm.

9.Doors and window openings in external walls within 3 m of the fire separating walls shall be protected by fire doors having a rating of at least 60 min and window openings may be protected by fire resistant glass assembly having same fire rating.

10.VENTILATION: Proper and adequate natural and mechanical ventilation as per requirement for all confined shed /industry of storages shall be installed relevant I.S. specification.

11.In the case of industry's/compartments having north-light roofs when a separating wall runs parallel to the axis of the north-light opening, the screen wall shall be carried through and 600 mm above the ridge of the north light. If however, the separating wall is at right angles to the axis of the north-light opening, the saw tooth gaps shall be bricked up and the screen wall extended 600 mm above the ridge of the north light as well as beyond the extreme north-light opening.

12. Similarly, the thickness of the floor slabs in case of industry's having upper levels shall be designed to provide fire rating as mentioned above.

13. Storage areas shall be separated from the remainder of the industry/block by fire walls.

14. Moderate and high hazard areas in industries to have two fire doors each having 180 min fire resistance rating.

15.Service ducts and shafts/Openings in walls or floors which are necessary to be provided to allow passages of all industry services like cables. Electrical wirings. Telephone cables. Plumbing pipes, etc, shall be protected by enclosure in the form of ducts/shafts having a fire resistance not less than 120 min. The inspection door for electrical shafts/ducts low voltage wiring running in shafts/ducts shall either be armored type or run through metal conduits. The space between the electrical cables/conduits and the walls/slabs shall be filled in by a fire stop material having fire resistance rating of not less than 120 min. This shall exclude requirement of fire stop sealing for low voltage services shaft. For plumbing shafts in the core of the industry with shaft door opening inside the industry, the shafts shall have inspection doors having fire resistance rating not less than 30 min.

16.For plumbing shafts doors which open in wet areas or in naturally ventilated areas or on external wall of the industry, the shafts may not require doors having any specified fire rating.

17. Fire License shall have to be obtained for proposed storing and processing with L.P.G. and other highly combustible articles.

18. Fire Notice for Fire Fighting and evacuation from the industry shall be prepared and be displayed at all vulnerable places of the industry.

19. Floor numbers and directional sign of escape route shall be displayed prominently.

20. The employees and security staffs shall be conversant with installed Fire Fighting Equipment's of the industry and to operate in the event of Fire and Testing.

21. Arrangement shall be made for regular checking, testing and proper maintenance of all the Fire Safety installation and equipment's installed in the industry to keep them in perfectly good working conditions at all times.

22.A crew of trained Fireman under the experienced Fire Officer shall be maintained round the clock for safety of the industry.

23. Mock Fire practice and Evacuation Drill shall be performed periodically with participation of all occupants of the industry. 24. Alternative power supply should be provided for the operation of all the fire protection system in the industry.

25. Proper housekeeping should be maintained in the industry both in storing and processing areas.

26.An independent two pump fire station with requisite men power, equipments and appliances as per norms shall be incorporated immediately.

27. Provision to be made to switch off the flow fuel from day-tank to the boiler, in case of exigency and to be installed with one number of 22.5 ltrs. Capacity trolley mounted AFFF/DCP extinguisher.

28.Generator room should be protected by suitable suppression system.

29. Storing of combustible, non-combustible and flammable materials should be separated by the fire resisting walls in the industry.

30.Explosion vents should be provided as per norms mentioned in the NBC part-IV in the industry.

31.All the due protection should be taken for chemical used by the industry.

32.Storage and kitchen area should be separated from each other by using fire resisting wall.

33.Entry should be restricted for entry of any unwanted person to avoid sabotage in the industry.

34. The industry should be abided by all industry rules.

35.In case of fire only trained person will fight the fire specially husk fire.

36.Portable fire extinguishers should be installed as per I.S. specification.

37. Fire resisting wall to be constructed in between storing room and workshop, or between two different occupancies.

38.No hazardous substance to be stored within the industry premises.

On compliance of all the above Life and Fire Safety Recommendation, the Director General, West Bengal Fire & Emergency Services shall be approved for necessary inspection and testing of all the installation, Fire Safety Certificate in favour of the occupancy shall be issued on being satisfied with the tests and performances of safety aspects of installation of the industry.

N.B. : ANY DEVIATION AND CHANGES THE NATURE OF USE OF THE INDUSTRY IN RESPECT OF THE RM APPROVED PLAN DRAWING, WITHOUT OBTAINING PRIOR PERMISSION FROM THIS OFFICE, THIS FIRE SAFETY RECOMMENDATION WILL BE TREATED AS CANCELLED.

Member Convener Kharagpur TEC, Paschim Medinipur West Bengal Fire & Emergency Services