CHAPTER 7
ADDITIONAL STUDIES

7.1 RISK ASSESSMENT & DISASTER MANAGEMENT:

M/s GaganFerrotech Limited is running its project on 18.85 ha of land at-Ikra, Jamuria Industrial Estate in Paschim Burdwan district of WB. The company has been granted prior EC for production of 0.4 MTPA finished steel.

The company is proposing its modification and expansion to reduce its production capacity from 0.4 MTPA to 0.3 MTPA steel, generate 24 MW power from waste heat recovery and AFBC completely utilizing char from DRI Kilns.

After modification, the facilities will be as follows:

1. 4x100TPD&1x350 TPD DRI Kilns
2. 5x20 T IF
3. 2x9 MVA SAF
4. 1x30 T AOD
5. 2x3 strand CCM
6. 16 MW WHRB Power Plant & 8 MW AFBC power Plant
7. Rolling Mill 1000 TPD

The process for production of above products carries a pool of Hazards & Risk, which can cause major Accidents if full proof action will not be taken within the purview of a full proof system. The Hazards may convert to risks due to the following major actions

1. due to leakage of toxic gases and red hot metal
2. one month's fuel stock at all the time of a year.
3. Coal will be stocked under shed
4. LDO in 1200 KL above ground tank; these are combustible and Fire/ pool fire is anticipated from these materials
5. Handling of Acid & Alkali
6. Release / leakages of steam
7. Electrocution
8. Explosion of Boilers etc

The proposed steel plant would be designed and engineered with all possible safety measures and standard code of practices of engineering. In spite of this, there may be some design deficiency or due to operation and maintenance fault which may lead to accidental events causing damage to the life and property. This chapter presents an overview of both environmental & physical risks associated with the production facilities, suggested remedial measures and a model outline of the emergency preparedness plan.

7.2 OBJECTIVES

The objectives of environmental risk assessment are governed by the following, which excludes natural calamities:

- To identify the potential hazardous areas so that necessary design safety measures can be adopted to minimize the probability of accidental events.
- To identify the potential areas of environmental disaster which can be prevented by proper design of the installations and its controlled operation
- To manage the emergency situation or a disastrous event, if any, from the plant operation.

Managing a disastrous event will obviously require prompt action by the operators and the crisis management personnel using all their available resources like alerting the people and other plant personnel remaining inside, deployment of firefighting equipment, operation of emergency shut off valves, opening of the escape doors, rescue etc.

Minimizing the immediate consequences of a hazardous event include cordoning off, evacuation, medical assistance and giving correct information to the families of the affected persons and local public for avoiding rumors and panic.

Lastly, an expert committee is required to probe the cause of such events and the losses encountered and suggest remedial measures for implementation so that in future such events or similar events do not recur.

7.3 DEFINITION OF HAZARD & RISK

The following terms related to environmental risks are defined before reviewing the environmental risks:

Harm	Damage to the person, property or environment.
Hazard	Something with the potential to cause harm; this could be a Characteristic of material being processed or malfunctioning of the equipment. An environmental hazard is thus going to be a set of circumstances, which leads to the direct or indirect degradation of environment and damage to the life and property.
Risk	The probability of the harm or likelihood of harmful occurrence being released and its severity. Environmental risk is a measure of the potential threat to the environment, life and property.
Consequence:	Effect due to occurrence of the event, which may endanger the Environment permanently or temporarily and, or, loss of life and property.
Environmental Disaster:	The consequence is so severe that it can extensively damage a one or all the four components of the environment, namely, (i) Physico-chemical, (ii) biological, (iii) human and (iv) aesthetics.

7.4 IDENTIFICATION OF HAZARDS

The hazards are attributable due to raw materials and chemicals used in steel making and the plant operation. A list of major raw materials used in the plant and the process units with their hazard potential is presented in Table below.

Table 7.1 Hazard Identification of the Proposed Steel Plant

Sl. No.	Group	Item	Hazard Potential	*Remarks*
I	**Raw materials and products**	Iron ore Coal Other fluxing minerals Product steel Acids/Alkalis Lube oil	None Moderate None None Major Moderate	- Fire - - Bio corrosive Flammable
II	**Processing**			
	DRI Kilns	Dust DRI off gas	Moderate None	Environmental Pollution -
	Steel making in IF	Fume Liquid steel Molten slag	None Major Major	 Personnel injury & fire Personnel injury
	Captive power plant	Fly ash Acid and alkali	Moderate Major	Environmental Pollution Highly corrosive & Pers injury
	High pressure Boilers	Leakage of steam at very high temperature Venting of High pressure steam	Major	Fatal accident Noise pollution Damage of adja equipments
III	**Utilities**			
	Fuel & gas Distribution	Oil &Gas leaks	Major	Fire and CO Pollution
	Electric power Supply	Short circuit High voltage shock	Major	Fire Fatal accident

From the Table, it may be observed that the major on-site emergency situation may occur from the organic coal chemicals storage and handling, fuel gas handling, molten metal and slag handling, acids and alkali storage and handling and electrical short-circuit. The off-site environmental disaster may occur if large-scale fire and explosion occurs, the effect of which extends beyond the plant boundary. The off-site environmental disaster may occur due to significant environmental degradation for a sustained period. Off-site environmental disaster not envisaged for this integrated steel plant. However pool fires from fuel oil storage tanks are not ruled out, and needs addressable.

7.5 RISK EVALUATION

From environmental hazards point of view for the raw materials and consumable chemicals and processing of the same in various production units, relative risk potential analysis is made on the following three factors:

- Likelihood of occurrence
- Likelihood of detection
- Severity of consequences

Each of these factors is graded and compiled to determine the risk potential. The factors governing the determination of relative risk potentials are presented in the Table 7-2.

Table 7.2 – Determination of Risk Potential

Likely hood of occurrence		**Likelihood of detection**		**Severity of consequences**	
Criteria (A)	Rank	Criteria (B)	Rank	Criteria (C)	Rank
Very High	**5**	Very High	**1**	None	**2**
High	**4**	High	**2**	Minor	**4**
Moderate	**3**	Moderate	**3**	Low	**6**
Low	**2**	Low	**4**	Moderate	**8**
Very low	**1**	Very low	**5**	High	**10**

RISK POTENTIAL (RP) = (A+B) X C

Based on the above stated criteria for assessing the risk, each probable event has been evaluated by addressing several questions on the probability of event occurrence in the view of the in-built design features detection response, operational practice and its likely consequence. A summarized list of environmental risk potential for the likely events is presented in Table below

This evaluation has been done with the presumption of common events as observed from the past experience in the operation of an integrated iron and steel plant and best practicable designs for the proposed project. The present risk potential evaluation is primarily based on human errors or faulty operation or failure of the control systems.

Table7.3: Environmental Risk Potential Evaluation

		Rank			
Sl No.	**Event**	**Likelihood of Occurrence**	**Likelihood of detection**	**Severity of Consequence**	**Risk Potential**
1	Fire at the coal Stockyard	Very low (1)	High (2)	High (10)	30
2	Fuel gas leaks from the Pipeline/valves	High (4)	Low (4)	High (10)	80
3	Splashing of molten Metal and slag	Very low (1)	Very high (1)	High (10)	20
4	Uncontrolled dust emissions/failure of Emission control	High (4)	Moderate (3)	Moderate (8)	56
5	Release of untreated Waste water	Low (2)	Very low (1)	High (10)	30
6	Leakage of acids/Alkalis	Low (2)	Very low (5)	Moderate (8)	56
7	Failure of gas Cleaning Plant/Fume Extraction	Moderate (3)	Moderate (3)	Moderate (8)	48
8	Unsafe disposal of oily Wastes of Rolling Mills	High (4)	Low (4)	Moderate (8)	64
9	Wet scrubbers Running dry	Low (2)	Moderate (3)	High (10)	50
10	Oil wastes/ oil sludge Handling	Low (2)	High (2)	Moderate (8)	32

From the table 7.3, it appears that some events carry risk potential above 50. These events will be considered as risk prone hazardous events and need adequate safe design operation and maintenance in order to reduce the risk.

7.5.1 HAZARD IDENTIFICATION & RISK ASSESSMENT OF ENVIRONMENTAL& PHYSICAL HAZARDS

ToR 3 (x) Hazard Identification and details of proposed safety measures

Table 7.4 Hazard Identification & Risk Assessment

	ACTIVITY CREATING HAZARD	Likelihood of occurrence (A)	RANK	Likelihood of detection (B)	RANK	Severity of consequence (C)	RANK	Risk potential = (A+B)XC	Preventive Measures
DRI									
1	Cleaning of cooler transfer chute	HIGH	4	VERY LOW	5	MODERATE	8	72	Safety rope and PPE to be used
2	cleaning of dust settling chamber	HIGH	4	VERY LOW	5	MODERATE	8	72	Use of PPE like safety shoes, helmets, gloves, aprons and goggles
SMS									
1	Fall of material due to Excess N2 purging	LOW	2	VERY LOW	5	HIGH	10	70	Purging to be done with calculated amount of N2
2	Burn injury due to overflow of hot material	LOW	2	VERY LOW	5	HIGH	10	70	Use of PPE like safety shoes, helmets, gloves, aprons and goggles
3	Burn injury due to broken of wire rope	LOW	2	VERY LOW	5	HIGH	10	70	Cordening of area with hooter arrangement during transportation
4	Fall of ladle due to broken of hanger	LOW	2	VERY LOW	5	HIGH	10	70	Cordening of area with hooter arrangement during transportation
5	Slip and fall due to accumulation of sponge iron on shop floor	MODERATE	3	MODERATE	3	LOW	6	36	Use of PPE like safety shoes, helmets, gloves, aprons and goggles

6	Falling of scrap due to mishandling of scrap during charging of scrap to SMS	MODERATE	3	MODERATE	3	MODERATE	8	48	Use of helmets and safety shoes
7	SLIPING OF PERSONS DUE TO Spillage of material on the shop floor during charging of raw material through mobile equipment	MODERATE	3	MODERATE	3	MODERATE	8	48	Use of PPE like safety shoes, helmets, gloves, aprons and goggles
8	Electrical Flashing / shock during Air cleaning of furnace capacitors and switch gear	LOW	2	LOW	4	HIGH	10	60	Electrical isolation, tagging, spot earthing
9	Electrical Shock during Checking of Capacitor bank	VERY LOW	1	MODERATE	3	MODERATE	8	32	Rubber hand gloves and insulator tools
11	Occurrence of static electricity/electric spark in the Mill Cellar Room	VERY LOW	1	VERY LOW	5	HIGH	10	60	Proper earthing to be ensured
12	Splashing of molten metal and slag	Low	2	VERY HIGH	1	HIGH	10	30	Face shield, helmet, asbestos appron
Rolling Mill									
1	Fall of material during hot slab handling	LOW	2	VERY LOW	5	HIGH	10	70	Sling to be checked from time to time, Use of PPE
2	BODY PART in between slab/chain	LOW	2	VERY LOW	5	MODERATE	8	56	Use of Hand gloves, Stopper switch at short intervals

3	Fire due to Electric short circuit during Firing with Tar	LOW	2	VERY LOW	5	LOW	6	42	Use of MCB
4	Back firing during Firing with Producer gas	LOW	2	VERY LOW	5	LOW	6	42	Use of Face shield
5	Fall of Plate, Cutting set, Fall on person during Plate/Cobble Cutting	LOW	2	VERY LOW	5	LOW	6	42	Use of helmet
6	Collision of hot coil strips during Shifting of Coil	LOW	2	very low	5	low	6	42	To be mechanically handled
7	Falling of objects from top	MODERATE	3	VERY LOW	5	MODERATE	8	64	Use of helmet & Safety Shoe
8	Un safe disposal of oily wastes of Rolling Mills	High	4	Low	4	Moderate	8	64	To be collected in drums and capped
CPP									
1	Furnace oil transfer from tanker to storage tank 1.Slip & Fall 2. Fire	LOW	2	HIGH	2	MODERATE	8	32	To be transferred Mechanically and Use of PPE
2	Operation of Boiler 1.EXPLOSION 2.TUBE LEAKAGE 3. BACKFIRE	LOW	2	LOW	4	HIGH	10	60	Periodic NDT to know the thickness of pipe and replacement with thinned down pipes. Interlocking of ID fan running with LDO firing.

3	Oil leakage from bearings & oil line on main steam line	LOW	2	LOW	4	LOW	6	36	Shrouding of evaporator coil
4	Chemical handling	MODERATE	3	LOW	4	MODERATE	8	56	Use of PPE like safety shoes, helmets, gloves, aprons and goggles
	1. ACID / ALKALI SPILLAGE								
5	Generation of dust during ash unloading on trucks	VERY HIGH	5	VERY HIGH	1	LOW	6	36	Use of Dusk Mask
6	Fall from height while working in the height	LOW	2	LOW	4	HIGH	10	60	Use of safety belt
7	Oil wastes/oil sludge handling	Low	2	High	2	Mode rate	8	32	Use of PPE like safety shoes, helmets, gloves, aprons and goggles
8	Collapsing of acid/ alkali storage tanks	Very low	1	High	2	High	10	30	Use of vacuum breaker
9	Leakages of steam line	LOW	2	HIGH	2	MODERATE	8	32	NDT of steam line at regular intervals specially at bends and thermal insulation of pipeline

From the Table, it may be observed that the major on-site emergency situation may occur from the organic coal chemicals storage and handling, fuel gas handling, molten metal and slag handling, acids and alkali storage and handling and electrical short-circuit. The off-site environmental disaster may occur if large-scale fire and explosion occurs, the effect of which extends beyond the plant boundary. The off-site environmental disaster may occur due to significant environmental degradation for a sustained period.

7.6 DISASTER MANAGEMENT PLAN

Tor-7(xiii) Onsite And Offsite Disaster Preparedness And Emergency Management Plan Including Risk Assessment And Damage Control.

Manpower

Table 7.5 Manpower to be in position

Sl. No	Shift	Period	Manpower available
1	A	6 AM to 2 PM	60
2	B	2 PM to 10 PM	60
3	C	10 PM to 6AM	60
4	O	Off duty	30
4	General shift	9AM-1PM, 2PM -6 PM	40 (Sunday off)
	Total		250

From the manpower deployment table, it can be seen that at any point of time in general shift hours 40 people will be available in plant, and 210 people in shift basis. More over some contract labors and security guards will be available in the plant. Therefore, planning has to be made for safety of these people during any onsite disaster.

In an integrated steel plant like this one, it is imperative that accidents occurring due to unforeseen acts and events will not affect the surrounding areas. Therefore, an onsite emergency plan for prevention and mitigations of accidents will be enough to cater for unforeseen acts and events that may occur.

Emergency situations: The following are the situations where we can face an emergency and disaster may take place.

a. Fire
b. Explosion
c. Oil Spillage
d. Toxic release (gases & chemicals)
e. Electrocution
f. Structure/building collapse
g. Flood/cyclone/earth quake/aggression/sabotage etc.

Area/Plant where different types of emergency situation can start:

a) Furnace area, Turbine hall, Boilers } Explosion

b) Oil storages, Conveyors, Coal } Pool Fire & Fire

c) LPG storage ----- Fire & Vapor Cloud Explosion

d) Electrical rooms, Transformer area, Cable tunnel } Fire & Electrocution

e) Water Treatment Plant (DM Plant) } Release of highly toxic gas - Chlorine

f) Power Plant (12 mw) ----- (DM Plant) Power Plant (12 mw) Spillage Of Acid & Alkali & Steam leakage

7.7 IDENTIFICATION OF HAZARDS:

Hazard is in fact the characteristics of a system/plant/storage that presents potential for an accident and risk is the probability of occurrence of hazard. Hence hazard identification is of prime significance for the quantification of risk and for cost-effective control of accidents in any industrial installation. Various techniques of predictive hazard evaluation and quantitative risk analysis suggest that identification of hazard has very important role in estimation of probability of an undesired event and its consequences on the basis of risk quantification in terms of damage to personnel, property and environment.

Hazards are mostly manifested in the form of toxic release. Each anticipated hazard scenario associated in the unit is described along with its assessment of impact on plant and locality in the following table:

Table 7.6 Hazard Identification in various facilities

Sl. No.	Area / Activity	Hazard	Hazard Potential	Impact
1	Storage and Handling of High Speed Diesel (HSD)	Pool Fire / Fireball may occur in case of direct contact with	Medium	Fire may propagate and spread over to other areas

		flame		
2	Storage and handling of LPG	Explosion may occur in case of leakage of gas with contact with fire	Major	Fire may propagate and spread over to nearby areas
3	Electrical Power supply and distribution in Transformer yard and motor control centre	Fire and electrocution may occur	Medium	Fire may propagate to other areas

7.7.1 IDENTIFICATION OF MOST CREDIBLE HAZARD SCENARIOS

The entire anticipated hazard scenarios associated with the unit are critically analyzed and the followings are considered as credible scenarios:

Credible Scenario – A: Pool Fire in High Speed Diesel Storage Tank.

Credible Scenario – B: Leakage of LPG gas from cylinder.

Credible Scenario – C: Leakage of oil from Storage Tank.

Credible Scenario – A: Pool Fire in High Speed Diesel Tank.

As there is other nearby establishments, the fire from HSD tank can easily spread causing extensive damage to the materials. However the damage due to fire will be confined to a particular area only.

On putting the basis of above consideration the pool fire due to fire hazard in the HSD storage tank is not considered as most but first degree credible scenario. It can be controlled by the available installations and facilities.

Credible Scenario – B: Leakage of LPG gas from cylinder.

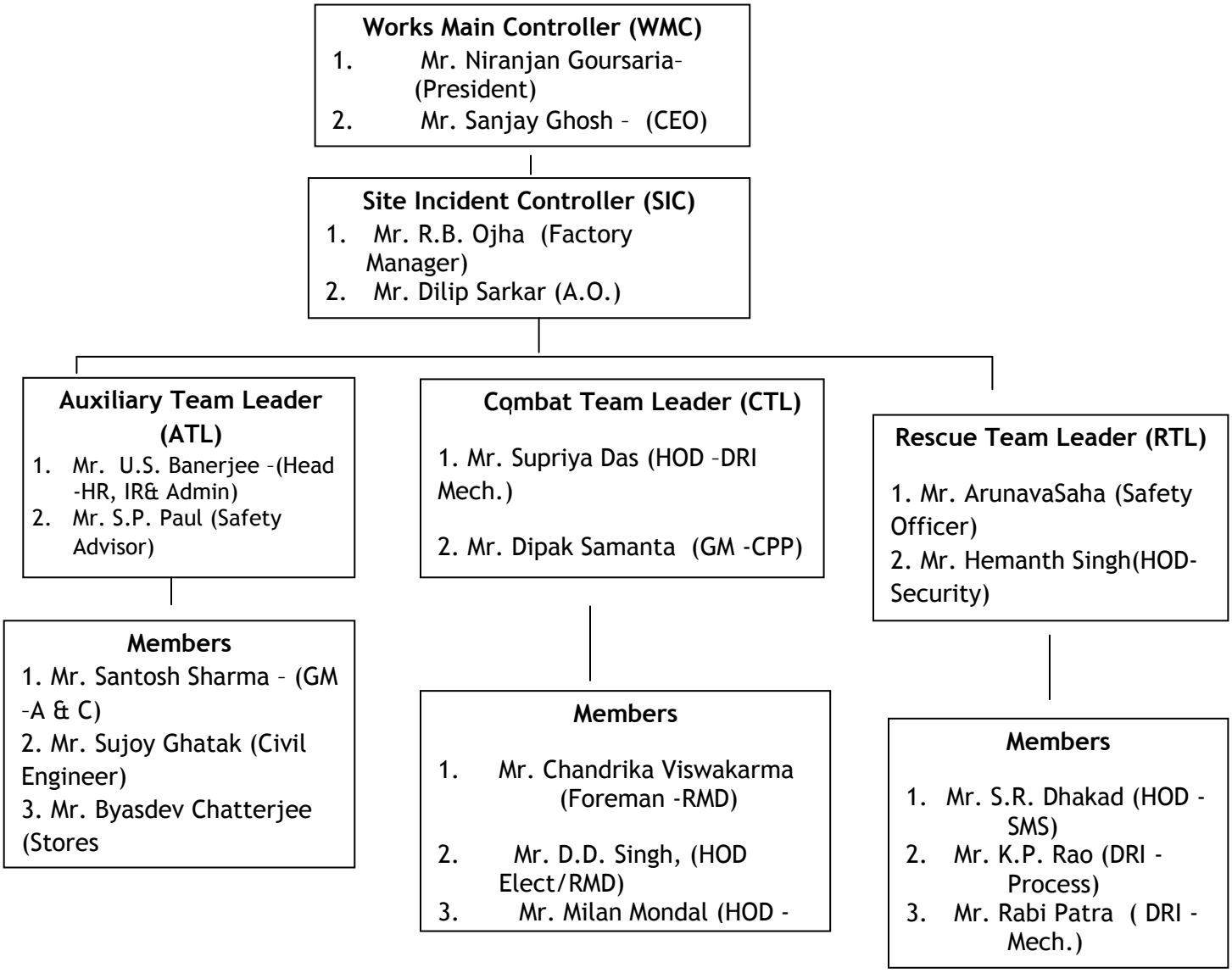
Either of these three can create most credible scenario if not attended immediately. However this can be controlled by isolation of the line from the system and will not lead to most credible scenario.

This can be taken as second degree credible scenario.

Credible Scenario – C: Leakage of LPG from Storage Tank.

Chance of leakage of LPG from the storage tank is very remote. If happens and not attended in time there will be vapor cloud explosion and it will be a most credible scenario.

EMERGENCY COMMAND STRUCTURE



Note :

WMC:SL No. 2 shall play the role of WMC in the absence of SL No. 1; otherwise he will assist SL No.1.

SIC: SL No. 2 shall play the role of SIC in the absence of SL No. 1; otherwise he will assist SL No.1.

CTL: SL No. 2 shall play the role of CTL in the absence of SL No. 1; otherwise he will assist CTL.

ATL: SL No. 2 shall play the role of ATL in the absence of SL No. 1; otherwise he will assist ATL.

RTL: SL No. 2 shall play the role of RTL in the absence of SL No. 1; otherwise he will assist RTL.

7.8 SILENT HOUR COMMAND STRUCTURE

- The Senior Officers/ Key Persons of the plant remain during day time i.e. 8am to 8 pm. Hence the timing of 8pm to 8am is considered as silent hour that to 10pm to 6am is the crucial time. Still each and every unit/section of the plant, which is in operation like RMD, Coal Washer, DRI Kilns, Power Plants, Utilities, SMS, CHP etc. with their process, maintenance and electrical people, is headed by shift in charge in the rank of Officer, Engineer or Sr. Engineer or Asst. Manager, who shall be responsible for handling the emergency. The other supporting/services and emergency sections like Fire Service, Ambulance, Security, Personnel, Water Supply, Transport departments etc. are also running for 24 hours shift wise with shift in charge and crew to handle emergency during the silent hour till main command personnel arrive. However, most of the key persons of the main command structure reside in the residential complex which is 200 mtrs. away from the main plant, with vehicles.
- The command structure of the silent hour shall be same as during normal hour, however, during the silent hour, the operation Shift-in charge of the concerned area where the fire or leakage of gas has taken place, shall act as CTL-in –charge, till the arrival of CTL.
- Since WMC, SIC, CTL, RTL & ATL may not be available inside the plant; they shall be informed by the CTL-in-charge either by telephone or by sending special messengers to their residences.
- On receiving the information WMC, SIC, CTL, RTL & ATL shall reach the site immediately & simultaneously take actions to ensure the presence of their respective team members.
- Therefore the action plan as well as the role of key person shall be same as the normal hour execution of command structure.

7.9 ROLE OF KEY PERSONS

7.9.1 WORKS MAIN CONTROLLER:

He is the Executive Director at the works and is generally available in the factory except on tour. On emergency, he can reach work site at any odd hour within 20 minutes time. In his absence, Sr. Vice President shall take up his charge as Works Main Controller (WMC).

On being informed of an incident, he has to:

- Rush to the emergency Site, collect all information from SIC.
- Decide if emergency is to be declared and advise Site incident Controller (SIC) accordingly and reach Emergency Control Room (ECR).
- Advise Rescue Team Leader (RTL)/ Security Gate to blow the siren with appropriate code for declaration of emergency.
  Two minutes with a pause of five seconds for 3 times for fire hazard.

Three minutes with pause of five seconds for 5 times for fire incident.

- Advice (Auxiliary Team Leader) ATL for communication to statutory authorities and for mutual aid as required.
- Through (Auxiliary Team Leader) ATL ensure constant communication to statutory authorities and to mutual aid partners as required.
- Maintain continuous communication with Site Incident Controller (SIC) to review the situation and assess the possible course of action for emergency operations.
- To declare normalcy at the end of operation and advise Rescue team leader (RTL)/security Gate to blow "all clear siren" [for 1 minute continuously].
- Ensure the record keeping of emergency operations chronologically.

7.9.2 SITE INCIDENT CONTROLLER:

He is available at the factory or in the colony near by at any point of time and on being informed about an accident, he has to:

- Intimate the works main Controller (WMC) and proceed to the emergency site.
- Take the necessary instruction from Combat Team Leader (CTL), assess the situation and call Rescue Team Leader (RTL) and Auxiliary Team Leader (ATL).
- Inform Works Main Controller (WMC) regarding the situation.
- Take necessary steps and provide guidance to Combat Team, Rescue Team, and Auxiliary Team Leaders to mitigate the emergency situation.
- Examine for major emergency shut down operation activities, decide safe escape route and announce for evacuation to Assembly Point.
- Inform Works Main Controller (WMC) about the status of the situation at regular intervals.

7.9.3 COMBAT TEAM LEADER

He is the leader to attend to the emergency and is available in the factory or in the colony at any instant.

On being informed about an accident, he has to:

- Immediately rush to the site and lead the team to control the situation.
- Inform Site incident controller (SIC) about the incident and request him to rush to the spot.
- Instruct the rescue Team leader (RTL) for fire fighting and medical assistance.
- Co-ordinate the activities of team members and combat the emergency, so as to eliminate the route cause of the hazard.
- Shut-down the plant if necessary to take up repair measures.
- To arrest the leakage and spillage from various equipments, shut down the concerned equipments.
- Take necessary action to remove unwanted persons from the site of the incident.
- Keep informed about the developments to Site incident Controller (SIC).

7.9.4 RESCUE TEAM LEADER

He is the person who conducts rescue operations and should be available at any instant.

On receiving the information about the incident he has to:

- Rush to site of emergency through safe route.
- Ensure presence of all his team members, availability of fire fighting facilities and take necessary action to arrest the fires.
- Arrange for safe escape of entrapped persons.
- Make necessary arrangements to send the affected persons for immediately medical attention through the medical officer.
- Search for the missing persons on the basis of role call taken by Auxiliary team leader (ATL).
- Give the feedback to the site incident controller (SIC) about the developments.

7.9.5 AUXILIARY TEAM LEADER

He is the communication manager for the crisis management. On being informed of the emergency, he should proceed to Emergency Control Room (ECR) and:

- Keep in constant touch with works main controller (WMC) and Site Incident Controller (SIC).
- Inform the Statutory Authorities and District Administration.
- Communicate to mutual Aid Partners, Fire service stations at Raniganj.
- Send communications to nearest Hospital for rendering services.
- Inform the relatives of causalities and send them to their residence or hospital.
- Take care of visit of the authorities to the Emergency site.
- Give feed back to work main controller (WMC) about the status with respect to his areas of activities.

7.10. ACTION PLAN FOR ON-SITE EMERGENCY PLAN

STEP NO	INITIATOR	ACTION TO TAKE
1.	The person noticing the emergency	• Inform the Security Gate, Combat team leader and the concerned Shift-in –charge immediately.
2.	Combat team Leader (CTL)	• Inform site incident Controller (SIC) and rush to spot and organize his team. • Take charge of the situation, arrange for fire fighting and medical first-aid available at site. • To start combating, shut-down equipments, arrest the fire.
3.	Site Incident	• Inform works main controller (WMC) and rush to emergency site.

	Controller (SIC)	• Discuss with Combat Team Leader (CTL), assesses the situation and call the Rescue Team Leader (RTL) & Auxiliary Team Leader (ATL). • Organize the Rescue Team and Auxiliary Team and send the rescue Team to site. • Arrange to evacuate the unwanted persons and call for additional help. • Pass information to the works main controller (WMC) periodically about the position at site.
4.	Works main Controller (WMC)	• Rush to emergency site and observe the ongoing activities. • Take stock of the situation in consultation with the SIC. • Move to Emergency Control Room. • Take decision on declaration of emergency. • Advise Auxiliary Team Leader to inform the statutory authorities and seek help of mutual aid from partners as required. • Decide on declaration of cessation of emergency. • Ensure that the emergency operations are recorded chronologically.
5.	Rescue Team Leader (RTL)	• Consult with Site incident controller (SIC) and organize his team with amenities to arrest fire fighting and medical treatment. • Rush to Emergency Site through safe route along with the team members. • Arrange to set off the fire by fire fighting equipments and hydrant points to arrest the fire or to evacuate the area. • Shift the injured persons to hospital by ambulance after providing necessary first aid. • To inform the auxiliary team Leader for necessary help from mutual aid Partners.
6.	Auxiliary Team Leader (ATL)	• On being directed by works main Controller (WMC) inform about the emergency to statutory authorities. • Seek help of Mutual Aid partners and Coordinate with Mutual Aid partners to render their services. • Arrange to inform the relatives of casualties. • Take care of visit of the authorities to the Emergency site.
7.	Team members	• Each of the team members should follow the instruction of concerned team leader to mitigate the emergency.

7.11 ACTIVATION & CLOSING PROCEDURE FOR ON-SITE EMERGENCY

The person noticing the incident of fire or leakage of gas, shall inform about the location & nature of incident to Fire Station, Safety, Security, Medical, and concerned Shift-in-charge. The shift-in-charge of the affected unit shall inform Combat Team Leader and other required/emergency team depending on the gravity of the situation.

- Combat team Leader (CTL) shall inform site incident controller (SIC) and shall rush to the site immediately. He shall arrange for fire fighting and first aid available at site. He shall arrange to take necessary steps to eliminate the root cause of fire.
- Site incident controller (SIC) on getting information shall inform the WMC and reach the site at the earliest. He shall take over the charge and shall direct Rescue Team Leader (RTL)) to carry out rescue operations including fire fighting and medical attention. Site incident controller (SIC) shall co-ordinate with Combat team leader (CTL) to eliminate the root cause of fire.
- Work main controller (WMC), on arrival at site shall take stock of the situation from site incident controller (SIC) and then rush to emergency control room (ECR) to declare emergency on the basis of assessment made by (Site incident controller (SIC). He shall give direction to the security gate/ (Rescue team Leader) RTL to activate siren.

Thirty seconds with a pause of five seconds, for 2 times, for major fire incident.

One minute with a pause of five seconds, for 3 times, for gas leakage. May be repeated again depending on the situation.

No siren for small fire or any other emergency situation.

- Rescue Team Leader (RTL) shall mobilize fire fighting and medical resources to site and shall assist (Site incident Controller) SIC.

- Auxiliary Team Leader (ATL) shall take charge of Emergency Control Room (ECR), shall ensure smooth operation of ECR and shall inform relatives of casualties. Informs mutual Aid partners and ensures their arrival at site if required.

- Auxiliary Team Leader (ATL) informs statutory authorities and district administration regarding emergency suitably and coordinates their visit at site.

- Works main controller (WMC) coordinates and keeps the track of all the activities at site and off the site and arranges the recording of the activities in a chronological manner for review of the On-site Emergency Plan.