1.0 **RISK ASSESSMENT AND HAZARD MANAGEMENT**

Hazard analysis involves the identification and quantification of the various hazards (unsafe condition) that exist in the plant. On the other hand, risk analysis deals with the identification and quantification of the risk, the plant equipment and Personnel are exposed to, due to accidents resulting from the hazards present in the plant.

Risk analysis involves the identification and assessment of risks to the population exposed to hazards present. This requires an assessment of failure probability, credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate consequently, the risk analysis in present case is confined to maximum credible accident studies and safety and risk aspect related to proposed project. The principle objectives of the Risk Assessment (RA) study is to determine probable risk of damage due to major hazards and to identify major risks in the storage of hazardous chemical at site and evaluate on-site & off-site consequences of identified hazard scenarios. Safety experts have incorporated all the safety features during plant design for effective mitigation of hazards and to minimize the preventive and protective measures to ensure safety.

Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

**On-site**
- Exposure to fugitive dust, noise, and other emissions
- Housekeeping practices requiring contact with solid and liquid wastes
- Emission/spillage etc. from storage & handling

**Off-site**
- Exposure to pollutants released from offsite/storage/related activities
- Contamination due to accidental releases or normal release in combination with natural hazard
- Deposition of toxic pollutants in vegetation / other sinks and possible sudden releases due to accidental occurrences
1.1 Risk Analysis Methodologies

The procedure used for carrying out the Quantitative Risk Assessment Study is outlined below:

- Identify Credible Loss Scenarios for the facility under the study by discussion with Plant Members. Simulate loss Scenarios to determine the vulnerable zones for toxic Dispersion, pool fire, Tank on fire (Thermal Radiation), Flash fire, Explosion over Pressure (Vapor cloud Explosion).
- Suggest mitigating measures to reduce the damage, considering all aspects of the facilities.

The flowchart of the methodology for the present study is shown in Figure below:

Fig 7.1: STUDY METHODOLOGY FLOW CHART FOR RISK ASSESSMENT

1.2 System for process safety, transportation, firefighting and Emergency preparedness to be adopted

Following facilities and system will be installed for mitigate the hazard and potential of accident:

1.2.1 Process Safety:
• Process plant will be made as per USFDA and GMP requirements and safety will be the first priority to make plant full proof safe.
• Safety measures will be adopted from the design stage.
• The reaction will be carried by heating, here the heat energy will be conducted vide steam through Jackets. Low Pressure Steam Line will be connected to these vessels with jackets /coils appropriately insulated. The vessels will also be fitted with safety valve, pressure indicator for visual periodic checks.
• Safety Valve and pressure gauge will be provided on reactor jacket.
• PRV will be provided from steam boiler high pressure line to control required pressure in reactor jacket.
• Utility like Chilling, cooling, vacuum, steaming and its alternative will be provided to control reaction parameters in a safe manner.
• Free Fall of any flammable material in the vessel will be avoided.
• Powder charging through man hole will be avoided and safe hoper with slotting arrangement will be adopted.
• Static earthing provision will be made at design stage to all solvent handling equipments, reactors, vessels & powder handling equipments.
• Any reaction upsets will be confined to the reaction vessel itself as defined quantity of charges of raw materials is issued to the reaction vessel/Day tank by metering pumps.
• Reactor vent line will be connected with reflux unit or condenser in case of VOC or with scrubber in case of toxic gas generation in reaction.
• All emergency valves and switches and emergency handling facilities will be easily assessable.
• Further all the vessels will be examined periodically by a recognized competent person under the Factory Act.
• All the vessels and equipments will be well earthed appropriately and well protected against Static Electricity. Also for draining in drums proper earthing facilities will be provided.
• Materials will be transferred by pumping through pipeline or by vacuum from drums.

• All solvents and flammable material storage tanks will be away from the Process plant and required quantity of material will be charge in reactor by Pump or by applying N2 pressure.

• Temperature indicators are provided near all reactor and distillation systems.

• Jumpers will be provided on all solvent handling pipeline flanges.

• Caution note, safety posters, stickers, periodic training & Updation in safety and emergency preparedness plan will be displayed and conducted.

• Flame proof light fittings will be installed in the Flammable zone area of the plant.

• All the Plant Personnel will be provided with Personal Protection Equipments to protect against any adverse health effect during operations, leakage, spillages or splash. PPE like Helmets, Safety Shoes, Safety Glasses, Acid-Alkali Proof Gloves etc. will be provided to the employees. All employees will be given and updated in Safety aspects through periodic training in safety.

• Material Safety Data Sheets of Raw Materials & Products will be readily available at the shop floor.

1.2.2 Hydrogenation Plant

• PLC base process controls and operation of plant will be installed.

• Area will be designed FLP type.

• Total enclosed process system.

• Instrument & Plant Air System.

• Nitrogen blanketing in Hydrogenation reactor.

• Safety valve and Rupture disc provided on reactor.

• Cooling Chilling and power alternative arrangement have been made on reactor.

• Hydrogen Cylinder bank away from the reactor.

• PRV station with shut off valve, safety valve provision will be made for hydrogenation reaction safety.

• Standard Operating procedure shall be made for Before Hydrogen Gas charging in to reactor and after completion of reaction Nitrogen flushing will be done.
• Flame arrestor will be provided on vent line of reactor and it will be extended above the roof level.
• Safe Catalyst charging method will be adopted.
• SOP will be prepared and operators will be trained for the same.
• Static earthing and electric earthing (Double) will be provided.
• Jumpers for static earthing on pipeline flanges of flammable chemical will be provided.
• Hydrogen gas detector will be installed for early detection of gas leak.

1.2.3 Transportation
• Class A petroleum products will be received through road tanker and stored in aboveground storage tank as per petroleum rules.
• Road tanker unloading procedure will be in place and will be implemented for safe unloading of road tanker.
• Static earthing provision will be made for tanker unloading.
• Earthed Flexible Steel hose will be used for solvent unloading from the road tanker.
• Fixed pipelines with pumps will be provided for solvent transfer up to Day tanks/reactors.
• Double mechanical seal type pumps will be installed.
• NRV provision will be made on all pump discharge line.
• Some chemicals will be received at plant in drums by road truck and stored in a separate drum storage area.

1.2.4 For Class A petroleum storage tank farm
• Class A petroleum products will be received through road tanker and stored in above ground storage tank as per petroleum rules.
• Tank farm will be constructed as per explosive department requirement and separation distance will be maintained.
• Static earthing provision will be made for road tanker as well as storage tank.
• Flame arrestor with breather valve will be provided on vent line.
Proposed Synthetic Drugs API (65 TPA) & Steroid (5 TPA) Plant
At Plot No. C-25, RIICO Industrial Area, Village Sotanala, Tehsil Behror, District Alwar (Rajasthan)

Risk Assessment and Hazard Management

- Road tanker unloading procedure will be prepared and implemented.
- Fire load calculation will be done and as per fire load Hydrant System will be provided as per NFPA std. and Fire extinguishers will be provided as per fire load calculation.
- Spark arrestor will be provided to all vehicles in side premises.
- Flame proof type equipments and lighting will be provided.
- Lightening arrestor will be provided on the top of chimney or highest level of the building.
- Trained and experience operator will be employed for tank farm area.
- NFPA label (hazard identification) capacity and content will be displayed on storage tank.
- Solvents will be transferred by pump only in plant area and day tank will be provided. Overflow line will be return to the storage tank or Pump On-Off switch will be provided near day tank in plant.
- Jumpers will be provided on solvent handling pipe line flanges.
- Flexible SS hose will be used for road tanker unloading purpose.

1.2.5 For Hydrogen skid
- Hydrogen road skid will be received by road and skid will be stored away from process plant.
- PRV station provided with shut off valve and safety valve.
- Flame proof light fitting installed.
- Static earthing and electric earthing (Double) provided.
- Jumpers for static earthing on pipeline flanges of flammable chemical will be provided.
- Non sparking tools will be used for hydrogen line fitting.
- Hydrogen detector will be provided for leak test.
- Pressure gauge will be provided.

1.2.6 For Drum Storage areas
- Only general shift material is being handled.
Risk Assessment and Hazard Management

- FLP type light fittings will be provided.
- Proper ventilation will be provided in godown.
- Proper label and identification board/stickers will be provided in the storage area.
- Drum pallets will be provided.
- Drum handling trolley/stackers will be used for drum handling.
- Separate dispensing room with local exhaust and static earthing provision will be made.
- Materials will be stored as Compatibility and separate area for flammable, corrosive and toxic chemical drums in store.
- Smoking and other spark, flame generating item will be banned from the Gate.
- Provision of secondary containment for spillage and spill control kit.

1.2.7 Safety Measures for Acid storage tank area

- Storage tank will be stored away from the process plant.
- Tanker unloading procedure will be prepared and implemented.
- Caution note and emergency handling procedure will be displayed at unloading area and trained all operators.
- NFPA label will be provided.
- Required PPEs like full body protection PVC apron, Hand gloves, gumboot, Respiratory mask etc. will be provided to operator.
- Neutralizing agent will be kept ready for tackle any emergency spillage.
- Safety shower, eye wash with quenching unit will be provided in acid storage area.
- Material will be handled in close condition in pipe line.
- Dyke wall will be provided to all storage tanks, collection pit with valve provision.
- Level gauge will be provided on all storage tanks.
- TREM CARD will be provided to all transporters and will be trained for transportation Emergency of Hazardous chemicals.
- Fire hydrant system with jockey pump as per TAC norms will be installed.
1.2.8 **Firefighting system**

- Provision for separate water reservoir of 400 KL capacity for Fire Hydrant system and provision of separate DG set for emergency power as per TAC guidelines.
- Sufficient quantity of Foam compound for firefighting during solvent Fire.
- Sufficient numbers of Fire extinguishers will be installed in plant and storage area as per IS 2190:2010 guidelines.

1.2.9 **Pipelines**

The various pipelines to transfer i.e. charging, draining etc. in the plant will be periodically inspected for Support, Vibration, Corrosion conditions, Painting, and Colour Code.

Pipelines and Flexible pipeline (SS 316/MS) are appropriately earthed to avoid accumulation of Static Electricity. Periodic Checkups of the pipelines will be conducted to curb any chances of mishap due to leakages. Preventive Maintenance Schedules will be in practice.

1.2.10 **Emergency Planning:**

- Transport Emergency planning and training to driver and cleaner will be provided.
- TREM card will be provided to transporter.
- On way emergency telephone number list will be provided to transporter.
- Hazardous chemicals handling & transportation safety SOP will be prepared and trained employees.
- Emergency siren and wind sock will be provided.
- Scenario base On Site emergency Plan will be prepared.
- Tele Communication system will be used in case of emergency situations for communication.
- First Aid Boxes and First Aiders will be made available in each shift at site.
- Hydrant system & sprinkler system will be provided as per requirements.
- Emergency response team will be prepared as per On site-Off Site emergency planning.
2.0  ON-SITE AND OFF-SITE EMERGENCY PLAN

2.1  On Site Emergency Plan

Shree Jee Laboratory Pvt. Ltd., will be engaged in the Manufacturing of API & Steroid (Life Saving Drugs) for which a number of Solvents are being used. Built-in-Safety features have been incorporated in utilizing these Chemicals and are followed on day to day in Manufacturing Process.

**Basic of Plan and Handling Emergency**

- Main Objective of this Procedure is to give basic Guidelines to combat the Emergency Situation. The key Persons involved should access the Situation on the spot and initiate quick decision to counter measure in order to overcome the situation.

- The Plan identifies the Services/Department required to combat the Emergency and also identifies the key Persons to discharge the Duties.

- The Shift In-charge, present on duty, will act as Chief Coordinator and retain the overall Responsibility for the Factory and its Personnel.

- Key Persons have been identified to combat the Emergency situation. Coordinator-Safety and Supervisor-Security shall provide full assistance to Unit Head and keep him updated with the situation.

- Any outside assistance in connection with Emergency shall be coordinated by Manager HR/Admin.

**General Guide Lines to Employees**

- Follow Sense of Discipline and not panic.
- Do not rush endanger your Personnel Safety.
- Do not block Passage which can hinder Emergency Operations.
- When evacuating, in case of Major Disaster, assemble at identified Assembly Point.
- Evacuate from your work area in orderly manner.
- Follow conscious approach in case there is a need for the communication to outside agencies.
In case you happen to be outside the Factory premises, guide your neighboring people after confirming the nature of Emergency at the site.

Pass appropriate and correct information about the nature of Disaster so that the affected people can be treated accordingly.

Always look up for the Wind direction, Run in the opposite direction.

Action to be taken in case of Fire/Others

Whenever there is a fire or any type of Emergency, the Plant Personnel of the affected area will inform Security and Senior Officer through Intercom/other means immediately.

On seeing Emergency, the Core Group Members will rush to the Emergency Site along with Fire Extinguishers and other rescues/emergency handling devices. Report to the Plant In-charge of the Affected Area and commence the Fire Fighting/Emergency Operation under the guidance of the Plant In-charge.

Electrical In-charge shall immediately rush to the Electrical Sub-station and shall be available there. The Electrician working in MCC Room/ Panel Room will be informed immediately to disconnect the Power, as required.

Manager HR/Admin shall rush to Gate and will be available there all the time to ensure if any assistance from outside Agency is required. (Fire Brigade or Hospital Services etc.)

Drivers of all the Vehicles will remain ready with Vehicles during the Emergency.

The Causalities/Affected Persons should be taken to Safe Zone where adequate First Aid may be made available to the affected Person.

Duties of Key Personnel and Essential Services

a) Unit Head

To make complete assessment or the situation as regard to the nature and extent of the Emergency.

Keep liaison with the outside agencies, as required, i.e. Neighboring Industries, Distt. Authorities, Govt. Agencies.

Keep Liaison with co-ordinator engaged in Emergency Control Operation and for the requirement of additional services.
b) Production Officer
   - Rush to the Site of Emergency.
   - Direct Plant Shut Down Operations as needed to control the Emergency.
   - Give Instructions to the Shift In-charge to evacuate any injured person for medical assistance.
   - Try to save the Material, Machines and Records from the Disaster with the help of others.
   - Carry out the Preliminary Investigations of the Accident and submit all the necessary details to General Manager. Ensure the availability/supply of additional Safety & Fire Fighting Equipments as may be required.

c) Manager-Maintenance/Project
   - Rush to the site of Emergency.
   - Assess the gravity of the situation with a view to render all Maintenance help to the Production Officer/Manager as required for isolation of Valuable Equipments/Piping.
   - Supervising overall Mechanical & Electrical Functions during Emergency.
   - Maintenance Fitter and Electrician should be made available at the Site.
   - Isolate the Power and Water Supply to the affected area, if required.
   - In the event of Power Failure during Emergency, ensure DG Set smooth running and un-interrupted supply to the Fire Water Pump.
   - Keep in the constant touch with the other coordinators at site and provide the necessary Assistance.

d) Manager-HR/Administration
   - Rushing to the Main Gate and take Control.
   - Access to Emergency with other coordinators.
   - Arrange external help like Fire Tenders, Medical help.
   - Communicating adequately with Press, Public, Police Station, Fire Brigade and other Authorities.
   - Arrange to send affected persons for Hospitalization.
Maintaining Law & Order and act accordingly.

Keep in touch with the Chief Coordinator and apprise him regularly of the situation.

Maintain vigilance at the site of Emergency for at least four hours after the Emergency is brought under control.

e) Supervisor-Security

- Liaisoning with other Emergency coordinators and seek assistance from outside Agencies in major Fires, as required.
- Keep in touch with the Manager-HR to assist in assessment of Law and Order situation.
- Ensure Security & Safety of Plant Personnel and Property during the Emergency.
- Maintain vigilance at the site of Emergency for at least one hour after the Emergency brought under control.
- Arrange for the hospitalization of the affected persons.
- Directing People to Safe Zone.

f) Security Guard/Core Group Member

- Will rush to Emergency Site along with Fire Extinguishers and report to concerned Plant In-charge and take control of any type of Emergency.
- Will also inform to the:
  a) Controller or Chief coordinator.
  b) Stores Officer.

Fire Fighting Facility

- Flexible Water Pipes provided around the plant will be directly connected to the Fire hydrant point.
- Sand Buckets will be provided inside & outside the Production Hall.
- Different Types of Fire Extinguishers will be provided at different sensitive points in side the plant.
- Portable Foam Type Extinguishers will be provided in side the Plant which can be moved to the site of Emergency. Foam acts as a Blanketing Agent to prevent availability of atmospheric oxygen.
**Essential Services and Control**

**First Aid/Medical Treatment**
- First aid given in case of minor cuts/burns, etc.
- In case of Major Accidents, affected persons shall be shifted to nearest Hospital.

**Telephone (Internal)**
- Internal Telephone Services throughout the Company.
- Emergency contact details listed below.

**Canteen**
- Manager- HR/Admin will ensure/arrange that hot and cold drinks, snacks and Food are available during the Emergency.

**First Aid**
- Remove the contaminated clothes and have a wash with plenty of water for at least 15 minutes.
- Direct the affected Personnel from the contaminated area to the Safe Zone/ fresh Open Area.
- Call Physician immediately.
- Never administer anything by mouth to unconscious person.
- If breathing is abnormal, administer oxygen if equipment and trained Person are available.
- Rest is best remedy.
- In case of Eye irritation, wash eyes with plenty of water for at least 15 minutes.
- Do not apply Solvent or ointment except as directed by the Physician.

**Emergency/Disaster Planning during Fire due to highly In-flammable Liquids/ Solvents**
- (Acetone; Ethyl Acetate; Isopropyl Alcohol; Pyridine; Toluene, Tri Ethyl Amine.)
- The company is having Batch Storage and Bulk Storage Facilities for these Solvents. The Bulk Storage Facilities are above the ground level and a few are stored in the drums for Easy and quick Transportation.
- The company is also having Solvent Recovery Plant, where the Mother Liquor coming from the Processes is distilled. These Solvents, it catches fire burn rapidly with a blue flame, difficult to see immediately.
• Electrical Driven Pumps with Flame Proof Motors are used and in addition to this, the areas having such Solvents Handling are declared as Flame Proof areas having complete Flame Proof fittings to avoid any mishap.

Following is the Procedure strictly followed in case Fire is located in the above areas:

• Follow the General Guidelines given earlier.
• Switch off the Electrical Supply to the concerned Section, if suggested by emergency coordinator.
• Isolate all the incoming/outgoing solvent lines valves and switch-off Solvent handling Pumps immediately.
• Cut off incoming and outgoing from Solvent Recovery to the Plant. Stop Steam Supply to distillation unit and run only Chilled Water for cooling purposes.
• Call Fire Brigade from nearest Fire station immediately.
• Use chemical/mechanical foam, CO2 and Dry Powder Type Extinguishers to Extinguish the Fire.
• Remove neighboring Drums of Solvents away from the Fire incident.
• In case of fire in the Bulk Storage close the valves of the neighboring Tanks and use Foam Type Fire Extinguisher.
• Do not use Water jet directly on the Solvent Fire as Water being heavier goes below the Solvents and Solvent will spill more thereby enhancing the Fire Area.
• If the Fire breaks out in Solvent Recoveries or Bulk Storage Area, i.e. an open area where a strong breeze may be there diluting the effect of the CO2 to quench the Fire. In such case, use dry Powder Type Extinguishers.
• In case of any Indoor Fires, use carbon di-oxide with dry Powder and Foam Extinguishers.
• Isolation of the area and removal of the excess material from the vicinity of the Fire will help to control the Fire at an early stage.

The Emergency Contact Numbers will be displayed on boards in various areas in the factory.

2.2 OFF-SITE EMERGENCY PLAN
Proposed Synthetic Drugs API (65 TPA) & Steroid (5 TPA) Plant
At Plot No. C-25, RIICO Industrial Area, Village Sotanala, Tehsil Behror, District Alwar (Rajasthan)

Risk Assessment and Hazard Management

- The type of Accidents and Release to be taken into account.
- Organizations involved including Key Personnel and Responsibilities and liaison arrangements between them.
- Information about the Site including likely locations of Dangerous Substances, Personnel and Emergency Control Rooms.
- Technical Information such as Chemical and Physical Characteristics and dangers of the Substances and Plant.
- Identify the Facilities and Transport Routes.
- Contact for further advice, e.g., Meteorological information, Transport, temporary Food and Accommodation, First Aid and Hospital Services, Water and Agriculture authorities.
- Communication link including Telephones, Radios and stand by methods.
- Special equipment including Fire-fighting materials, Damage control and Repair items.
- Details of Emergency response procedures
- Notify the Public.
- Evacuation arrangements.
- Arrangements for dealing with the Press and other Media interests.
- Longer term clean.

**Type of Accidents and Release taken in account**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of Accidents</th>
<th>Release taken in account</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fire and explosion due to limited fire prevention measures</td>
<td>Proper Selection and installation of firefighting equipment in effective locations will be implemented. Fire alarms are to be in place.</td>
</tr>
<tr>
<td>2.</td>
<td>Non functional firefighting equipment improper selection of type of fire extinguishers.</td>
<td>An emergency response and procedure to be implemented and upgraded periodically.</td>
</tr>
<tr>
<td>3.</td>
<td>No emergency response procedure in place.</td>
<td>Training on safe operation of fire extinguishers to be imparted to working class. Mock drills will be carried out on regular</td>
</tr>
</tbody>
</table>
**Proposed Synthetic Drugs API (65 TPA) & Steroid (5 TPA) Plant**

At Plot No. C-25, RIICO Industrial Area, Village Sotanala, Tehsil Behror, District Alwar (Rajasthan)

**Risk Assessment and Hazard Management**

Proper storage and transportation of compressed gas cylinder to be ensured.  
Fire proof electrical wiring system and flame proof electric gears to be installed during construction stage.  
Use of fire proof construction material will be encouraged for building purposes.  
Periodic inspection of fire prevention equipment to be established.  
Frequent inspection and scheduled maintenance will be made compulsory.  
Inspection schedule for Earthing/grounding, electrical wiring and equipment shall be maintained. |

**CHEMICAL EXPOSURE**

| Work-place Hazardous Material Information System (WHMIS) | Precautionary measures (such as hand gloves, masks and apron) as per manufacturer requirements/recommendations for handling different types of chemicals to minimize potential chemical exposure when working with hazardous chemicals to be in place.  
Color-coding system for hazardous chemicals, adequate labeling system. | Appropriate labels for all hazardous e.g. flammable and combustible material, oxidizing material, poisonous material, toxic material and corrosive material, for clear identification of risks and precautionary measures.  
Safety Data Sheet (MSDS) is given by manufacturers. | Training shall be conducted regularly to educate all the employees about the meaning of symbols and signs.  
Compliance with regulatory measures to be undertaken.  
Periodic safety audit will be carried out by Central Safety Committee.  
Periodic maintenance and validation to be in place for checking |
**Proposed Synthetic Drugs API (65 TPA) & Steroid (5 TPA) Plant**  
At Plot No. C-25, RIICO Industrial Area, Village Sotanala, Tehsil Behror, District Alwar (Rajasthan)

<table>
<thead>
<tr>
<th>Risk Assessment and Hazard Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Effectiveness of the engineering control devices and mitigation measures.</td>
</tr>
<tr>
<td>- Records of all incidents/events related to handling of hazardous chemicals to be kept and reviewed periodically.</td>
</tr>
<tr>
<td>- Periodic up-gradation of training module to be established.</td>
</tr>
</tbody>
</table>

**Key Personnel and Responsibilities and Liaison Arrangements**

**Duties of Key Personnel and Essential Services**

**Unit Head**
- To make complete assessment of the situation as regard to the nature and extent of the Emergency.
- Keep Liaison with the outside agencies, as required, i.e. Neighboring Industries, Distt. Authorities, Govt. Agencies.
- Keep liaison with co-coordinator engaged in Emergency Control Operation and for the requirement of additional services.

**Production Officer**
- Rush to the site of Emergency.
- Direct plant shut down operations as needed to control the Emergency.
- Give Instructions to the shift In-charge.
- Try to save the Material, Machines and records from the Disaster with the help of others.
- Carry out the preliminary investigations of the Accident and submit all the necessary details to General Manager.

**Manager – Maintenance/Project**
- Rush to the site of Emergency.
- Assess the gravity of the situation with a view to render all Maintenance help to the Production Officer/Manager as required for isolation of Valuable Equipments/Piping.
- Supervising overall Mechanical & Electrical Functions during Emergency.
• Maintenance Fitter and Electrician shall be made available at the site.
• Isolate the Power and Water Supply to the affected area, if required.
• In the event of Power Failure during Emergency, ensure DG Set smooth running and un-interrupted supply to the Fire Water pump.
• Keep in constant touch with the other coordinators at site and provide necessary assistance.

**Head-HR/Administration**

• Rushing to the Main Gate and take Control.
• Access to Emergency with other coordinators.
• Communicating adequately with Press, Public, Police Station, Fire Brigade and other Authorities.
• Arrange to send affected Persons for Hospitalization.
• Maintaining Law & Order and act accordingly.
• Keep in touch with the Chief Coordinator and apprise him regularly of the situation.
• Ensure the availability / supply of additional safety &fire fighting equipments as may be required.
• Maintain vigilance at the site of Emergency for at least four hours after the Emergency brought under control.

**Supervisor - Security**

• Liaisoning with other Emergency coordinators and seek assistance from outside Agencies in major Fires, as required.
• Keep in touch with the Manager-Personnel to assist in assessment of Law and Order situation.
• Ensure Security & Safety of Plant Personnel and Property during the Emergency.
• Maintain vigilance at the site of Emergency for at least one hour after the Emergency brought under control.
• Arrange for the hospitalization of the affected persons.
• Directing people to Safe Zone.

**Security Guard / Core Group Member**
Will rush to Emergency Site along with Fire Extinguishers and report to concerned Plant In-charge and take control of any type of Emergency.

**Information about the Site including likely locations of Dangerous Substances.**

**Personnel and Emergency Control Rooms**

Shree Jee Laboratory Pvt. Ltd. will be engaged in the Manufacturing of API & Steroid (Life Saving Drugs) for which a number of Solvents will be used. Built-in-Safety features have been incorporated in utilizing these Chemicals and will be followed in day to day Manufacturing Process.

The company will have Batch Storage and Bulk Storage Facilities for the Solvents listed below:

1. Acetone
2. Ethyl Acetate
3. Isopropyl Alcohol
4. Toluene
5. Tri Ethyl Amine

Bulk Storage Facilities will be above the ground level and a few will be stored in the drums for easy and quick transportation. The company will also have Solvent Recovery Plant, where the Mother Liquor coming from the Processes will be distilled. These Solvents, if catch fire burn rapidly with a blue flame, difficult to see immediately. Electrical Driven Pumps with Flame Proof Motors will be used and in addition to this, the areas having such Solvents Handling will be declared as Flame Proof areas having complete Flame Proof fittings to avoid any mishap.

**Identify the Facilities and Transport Routes**

**Basic of Plan and handling Emergency**

- Main Objective of this Procedure is to give basic Guidelines to combat the Emergency Situation. The key persons involved should access the Situation on the spot and initiate quick decision to counter-measure in order to overcome the situation.
- The plan identifies the Services/Department required to combat the Emergency and also identifies the key Persons to discharge the Duties.
• The Shift In-charge will act as Chief Co-ordinator and retain the overall Responsibility for the Factory and its Personnel.

• Key persons have been identified to combat the Emergency situation. Co-coordinator-safety and Supervisor-Security shall provide full assistance to Unit Head and keep him updated with the situation.

• Any outside assistance in connection with Emergency shall be co-coordinated by Head -HR & Admin.

Special equipment including Fire-Fighting materials, Damage Control and Repair items

Fire Fighting Facility
• Flexible Water Pipes will be provided around the Pant.
• Sand Buckets will be provided inside & outside the Production Hall.
• Different Types of Fire Extinguishers will be provided at different sensitive points inside the Plant.
• Portable Foam Type Extinguishers will be provided inside the plant which can be moved to the site of emergency. Foam acts as a Blanketing Agent to prevent availability of atmospheric Oxygen.

Details of Emergency - response procedures

Action to be taken in case of Fire/Others
• Whenever there is a Fire or any type of Emergency, the Plant Personnel of the affected area will inform Security and Senior Officer through Intercom/other means immediately.

• On seeing Emergency, the Core Group Members will rush to the Emergency Site along with Fire Extinguishers; Report to the Plant In-charge of the Affected Area and commence the Fire Fighting / Emergency Operation under the guidance of the Plant In-charge.

• Manager - Maintenance will immediately rush to the Electrical Sub-station and shall be available there. The Electrician working in MCC Room/Panel Room will be informed immediately to disconnect the Power as required.
• Manager – HR/Admin shall rush to Gate and will be available there all the time to ensure if any assistance from outside Agency is required. (Fire Brigade or Hospital Services, etc.)

• Drivers of all the vehicles will remain ready with vehicles during the Emergency.

• The Causalities/Affected Persons will be taken to Safe Zone where adequate First aid will be made available to the affected person.

Follow the General Guidelines given earlier.

• Switch off the Electrical Supply to the concerned section.

• Isolate all the incoming/outgoing solvent lines valves and switch-off solvent handling pumps immediately.

• Cut off incoming and outgoings from solvent Recovery to the Plant. Stop Steam Supply to distillation unit and run only Chilled Water for Cooling purposes.

• Call Fire Brigade from nearest Fire Station immediately.

• Use Chemical/Mechanical Foam, CO2 and Dry Powder type Extinguishers to extinguish the Fire.

• Remove neighboring Drums of Solvents away from the fire incident.

• In case of fire in the Bulk Storage, close the valves of the neighboring tanks and use Foam Type Fire Extinguisher.

• Do not use water jet directly on the solvent fire as Water being heavier goes below the Solvents and Solvent will spill more thereby enhancing the Fire Area.

• If the Fire breaks out in Solvent Recoveries or Bulk Storage Area, i.e., an open area where a strong breeze may be there diluting the effect of the CO2 to quench the Fire. In such case, dry Powder Type Extinguishers will be used.

• In case of any Indoor Fires, use carbon dioxide with dry Powder and Foam Extinguishers.

• Isolation of the area and removal of the excess material from the vicinity of the Fire will help to control the Fire at an early stage.

**Emergency / Disaster Planning in case of Electrical Fire**

• Electricity is the Main Source of Energy for running the Machinery Equipments are having Electrical Fixtures/Motors moved by the Electrical Power. Hence the danger of Electrical Fire always exists due to short circuiting, overhauling, etc.
In case of Electrical Fires, the first thing is to switch off the Power Supply to the particular Equipment, then Area and finally, if necessary the entire Section. Once the Main Switch is off, the 1st danger is reduced.

Never use Water on the Electrical Fires.

Use preferably Carbon dioxide Extinguishers, which will not only control the Fire but also not damage the Electrical Equipment.

Dry Powder Extinguishers can be used but after the use of this, the entire Equipment needs to be cleaned thoroughly to make free from Dry Powder.

In case of Electrical trapping of a person, use absolutely dry wooden stick and isolate the victim from the Trap.

If any Transformer catches fire, the transformer oil will start burning for which CO2, Dry Powder or Chemical Foam may be used.

Follow the usual Emergency Procedure.

Once the Electrical Main Switch is switched off, isolate the solvent transferring activities, Steam Supply to avoid further Reaction in the Process which may complicate the situation.

Notify the Public

The Village Sarpanch at Jainpuwas shall be notified immediately in case of major mishap.

Evacuation arrangements

General Guide Lines to Employees

Follow Sense of Discipline and not to Panic.

Do not rush, endangering your personal safety.

Do not block Passage which can hinder Emergency Operations.

Evacuate, in case of Major Disaster, assemble at identified Place.

Evacuate from your Work area in orderly manner.

Follow conscious approach in case there is a need for the communication to outside.

In case you happen to be outside the Factory Premises, guide your neighboring People after confirming the nature of Emergency at the Site.
Proposed Synthetic Drugs API (65 TPA) & Steroid (5 TPA) Plant
At Plot No. C-25, RIICO Industrial Area, Village Sotanala, Tehsil Behror, District Alwar (Rajasthan)

Risk Assessment and Hazard Management

- Pass complete information about the nature of Disaster so that the affected people can be treated properly.
- Always look up for the Wind direction, Run to the opposite direction.

**Arrangements for dealing with the Press and other Media interests**
Manager-HR & Admin shall co-ordinate with the Press and other Media

**Longer term clean-up**

**First Aid**
- Remove the contaminated clothes and have a wash with plenty of water for at least 15 minutes.
- Direct the affected personnel from the contaminated area to the Safe Zone/ fresh Open Area.
- Call Physician immediately.
- Never administer anything by mouth to unconscious person.
- If breathing is abnormal, administer oxygen if equipment and trained person are available.
- Rest is best remedy.
- In case of Eye irritation, wash eyes with plenty of water for at least 15 minutes.