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	Storage and handling of hazardous chemicals			
	Department QHSE	Document Ref. No. QHSE-DOCS-RA-0000	Issue Date 00-00-0000	Revision 00

Company Name:	ABC	Prepared by:	
Functional Area/SOW:	Storage and handling of hazardous chemicals	Approved by:	

S/N	Activities	Hazard / Hazardous Situation	Risk	Initial Risk			Control Measures	Residual Risk			Action by
				L	C	RR		L	C	RR	
1	Transportation of raw materials and chemicals	Spillage of material during transportation.	Exposure to the liquid chemical can cause injuries and burns—especially acetic acid, Pyridine, Hydrochloric acid, etc. The liquid material (chemicals) spillage can cause and generate various types of pollution such as land, air, and sea pollution due to the spread of vapors of the chemicals.	3	5	15	4.1. Spillage of material during transportation: 4.1.1. Ensure proper packaging and securing of containers to prevent spillage. 4.1.2. Train personnel in safe handling practices during transportation. 4.1.3. Use spill containment measures such as spill kits and absorbent materials in vehicles.	2	2	4	Project Manager/ Engineer Project Supervisor QHSE Officer
2	Unloading of material from road tanker/truck	Leakages of liquid material during transfer– unloading using hose. Risk of fire.	Exposure to toxic vapors and fumes as highly hazardous materials like acetic acid, ethanand ol, P-	3	5	15	4.2. Leakages of liquid material during transfer– unloading using a hose.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer

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			toluene sulphonic acid is handled. Health risks to workers				4.2.1. Implement regular inspection and maintenance of hoses and transfer equipment. 4.2.2. Use hoses equipped with safety features like leak detectors and automatic shut-off valves. 4.2.3. Provide fire-resistant barriers and equipment in transfer areas. 4.2.4. Conduct training on proper transfer procedures and emergency response protocols.				
3	Storage of raw material and finished product Use of electrically operated machines and pumps	Spillage of material during handling. The material may catch fire as some chemicals like Pyridine, Ethanol are flammable. Health risks in case of contact with material	Exposure to toxic vapors and fumes. Health risk to workers. Risk of catching fire	3	5	15	<u>4.3. Spillage of material during handling:</u> 4.3.1. Provide adequate training on proper handling techniques. 4.3.2. Use spill containment trays or barriers around handling areas. 4.3.3. Ensure the availability of personal protective equipment (PPE) for workers. 4.3.4. Store flammable materials in designated areas with appropriate ventilation.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer
4	Use of electrically operated machines and pumps	Hazards due to electrical shock	Electrical shock can result in serious injury or can be fatal	3	5	15	<u>4.4. Hazards due to electrical shock:</u> 4.4.1. Implement regular inspection and maintenance of electrical systems.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer

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							4.4.2. Install ground fault circuit interrupters (GFCIs) in areas where water or chemicals are present.				
							4.4.3. Provide training on electrical safety procedures.				
							4.4.4. Use insulated tools and equipment when working on electrical systems.				
5	Degradation or contaminated by incompatible material. Uncontrolled reaction.	Possibility of runaway reaction. Possibility of deterioration of product quality and generation of process waste (Hazardous)	Risk of fire, injury and health problems to workers.	3	3	9	<u>4.5. Possibility of runaway reaction:</u> 4.5.1. Implement process control measures such as temperature monitoring and automatic shutdown systems. 4.5.2. Conduct thorough process hazard analyses to identify and mitigate risks. 4.5.3. Provide emergency response training for personnel. 4.5.4. Ensure proper ventilation to control the buildup of hazardous vapors.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer
6	Disposal of solid and hazardous waste like packing material and used chemical drums.	Exposure to toxic remains of material. Critical injury while handling solid and hazardous liquid chemical and or substances waste drums.	Health effect and minor injury	3	5	15	<u>4.6. Exposure to toxic remains of material:</u> 4.6.1. Implement proper waste management practices for handling and disposal of toxic materials. 4.6.2. Provide personal protective equipment (PPE) such as gloves, goggles, and respiratory protection. 4.6.3. Conduct regular monitoring for exposure levels and implement controls accordingly.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer

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						4.6.4. Train personnel on safe handling and disposal procedures.					
7	Reactor operation	Overheating of material may cause runaway reaction and generation of hazardous waste due to bad quality of material. Spillage of material, chemicals while transferring and charging the material to reactor. Generation of vapors and or fumes while charging liquid methylene chloride (CH₂Cl₂) to reactor.	 Health risks to employees involved working in the reactor. The critical health risk due to inhalation of toxic vapors while charging the material in the reactor.	3	5	15	4.7. Overheating of the material may cause a runaway reaction: 4.7.1. Implement temperature control measures and monitoring systems. 4.7.2. Conduct regular maintenance of heating equipment and reactors. 4.7.3. Provide emergency cooling systems and procedures. 4.7.4. Train personnel on safe handling procedures for volatile chemicals.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer

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8	Storage and handling of finished goods.	Chances of spillage while transferring from reactor to storage drum or container. Chances of accident while transporting the goods.	Injury to workers. Health risks are also involved.	3	5	15	<u>4.8. Chances of spillage while transferring from reactor to storage drum or container:</u> 4.8.1. Use closed transfer systems to minimize the risk of spillage. 4.8.2. Implement proper labeling and handling procedures for containers. 4.8.3. Provide spill containment measures such as secondary containment systems. 4.8.4. Conduct regular inspection and maintenance of transfer equipment.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer
9	Operation of DG set and rotating machines	Generation of noise due to rotating machines/DG set.	Impairment of hearing	3	5	15	<u>4.9. Generation of noise due to rotating machines/DG set:</u> 4.9.1. Implement engineering controls such as soundproofing or noise barriers. 4.9.2. Provide hearing protection devices for workers. 4.9.3. Conduct regular maintenance of machinery to minimize noise levels. 4.9.4. Rotate workers to minimize prolonged exposure to high noise levels.	1	2	2	Project Manager/ Engineer Project Supervisor QHSE Officer

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OSH Risk Matrix

Probability	Consequence				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Rare (1)	1	2	3	4	5
Possible (2)	2	4	6	8	10
Likely (3)	3	6	9	12	15
Often (4)	4	8	12	16	20
Frequent/Almost Certain (5)	5	10	15	20	25
15 - 25	Extreme Risk	Activity or Industry Should Not Proceed in Current Form			
8 - 12	High Risk	Activity or Industry should be modified to include remedial planning and action and be subject to detailed OSH Assessment			
4 - 6	Moderate Risk	Activity or industry can operate subject to management & Modification			
1 - 3	Low Risk	No Action is Required Unless Escalation of Risk is Possible			

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	Name	Date:	Signature
Project Manager:			
Project Engineer:			
QHSE Officer:			

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