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								_	Revision #		02	
	A III		Risks & Or	pportunities Asso	essment			E	Effective	01,	/10/20	J22
	USM P		-	O <sub>2</sub> (HSE, HLR & F				C	Circulation #		00	
Sr No	Activities/ Processes	Hazard Type. Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	Risk P	Evalua S	tior R	Additional Controls	Res	sidual I	Risk R
		P	Physical contact between humans and heavy vehicles.	Minor & Major injuries.     Property loss.	Traffic control SOP     Valid license holder driver.     PPEs (Safety vest for security staff)	1	3	3				
		E	Hot Weather/ Heat stress	Dehydration	Drinking water facility.     Drink frequent drinking water.     Drinking water analysis report.     Rest breaks.     PPEs (Safety helmet)     Air ventilation.	1	3	3				
		P & F	Improper cleaning of process equipments.	May cause contaminated product.     Product loss	Area cleaning through washing if needed.	2	2	4				
1	Molasses Decanting/ Storage.	P	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire	Insulated electrical supply/ connection     Covered electrical D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PPEs (Safety helmet, Shock resistant gloves and shoes)	2	2	4				
		P&F	Storage contamination during storage due to rusting.	Can cause increase impurities in final product.	Yearly cleaning of storage tanks.	1	2	2				
		B & F	Uncovered molasses channels	Product may contaminate due to uncovered channels	Cover the molasses channels     Proper area cleaning	1	2	2				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				
		HLR	Child labor	Accidents / suffer education illiteracy	Child labor (blow 18 years age) are strictly prohibited.     Verification of age by CNIC.     Human/ Labor Right Policy (SOP-0423)	1	1	1				

Γ		Hazard Type.				Risk E	Eval	uatio		Re	sidual	Risk
Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	s	R
		B, C & F	Use of yeast, nutrients and chemicals.	Respiratory infections.     Skin burn	1. CAO 2. MSDS 3. Use of PPEs	1	2	2				
	_	Р	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire & Explosion     Product loss	Insulated electrical supply/ connection     Covered D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PPEs (Shock resistant gloves and safety shoes)	2	2	4				
		E	High noise	Chronic effects ears, hearing loss.	PPEs (Use of ear plugs to prevent from hearing loss)     Ear protection safety signages.	2	2	4				
		E	Hot Weather/ Heat stress	Dehydration	Drinking water facility.     Drink frequent drinking water.     Drinking water analysis report.     Rest breaks.     PPEs (Safety helmet)     Air ventilation.	1	3	3				
2	Fermentation	E & P	CO2 Gas leakage	Nausea & Vomiting     Product loss     Damage to environment ( air pollution)	PPEs     CO₂ Recovery plant.     Proper supervision & system monitoring     Gas detector	1	2	3				
		С	Chemical dosing for cleaning purpose (Caustic soda)	Skin burn     Major & minor injury	MSDS     Training of staff     Personal protective equipment ( Chemical coverall, splash goggles, helmet, face mask, rubber gloves & gum boots).     Safety signages	2	2	4				
		E & C	Hazardous waste (Chemical bags)	Empty chemicals bags, Hazardous waste effects on health (infections & diseases)	Training on chemical handling of staff.     Allocate hazardous waste collection spot.     Personal protective equipment for cleaning and handling.	2	2	4				
		E & C	Effluents/ Waste water	Water polution	Training on chemical handling of staff.     Waste water treatment plant.     Personal protective equipment for cleaning and handling.	2	2	4				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				

		Hazard Type.				Risk I	Eval	uatio		Re	sidual	Risk
Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	s	R
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				
2	Fermentation	HLR	Child labor	Accidents / suffer education / illiteracy	Child labor (blow 18 years age) are strictly prohibited.     Verification of age by CNIC.     Human/ Labor Right Policy (SOP-0423)	1	1	1				
	Distillation	Р	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire & Explosion     Product loss	Insulated electrical supply/ connection     Covered D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PEs (Shock resistant gloves and safety shoes)     Safety signages     Res Sop     Gas detector     Seme supply supp	2	2	4				
3		Р	Internal equipment cleaning (Confined space works)  1. Excessive heat  2. Unauthorized person.  3. Electrocution.  4. Hot surface  5. Improper lighting	Permanent disability.     Minor & major injuries.     Slip / trip & fall .      Skin burns	1. Unauthorized Person Entry is prohibited. 2. Entry prohibited until surface temperature cool down. 3. Take breaks within each 1 hour. 4. Conduct confined space training with work force and share the hazards. 5. Ensure safe access and egress. 6. LOTO must be ensured if required. 7. Use proper specific PPEs.	2	2	4				
		c	Chemical dosing for cleaning purpose (Caustic soda)	Skin burn     Major & minor injury	MSDS     Training of staff     Personal protective equipment ( Chemical coverall, splash goggles, helmet, face mask, rubber gloves & gum boots).     Safety signages	2	2	4				
		С	Chemical dosing for cleaning purpose (Nitric acid)	Skin burn     Major & minor injury	MSDS     Training of staff     Presonal protective equipment ( Chemical coverall, splash goggles, helmet, face mask, rubber gloves & gum boots).     A. Safety signages	2	2	4				
		Ε	High noise	Chronic effects ears, hearing loss.	PPEs (Use of ear plugs to prevent from hearing loss)     Ear protection safety signages.	2	2	4				

	]	Hazard Type.				Risk	Eva	luatio	r	Re	sidual	Risk
Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	s	R
		E&C	Hazardous waste (Chemical bags & containers)	Empty chemicals bags & containers, Hazardous waste effects on health (infections & diseases)	Training on chemical handling of staff.     Allocate hazardous waste collection spot.     Personal protective equipment for cleaning and handling.	2	2	4				
3	Distillation	E & C	Effluents/ Waste water	Water polution	Training on chemical handling of staff.     Waste water treatment plant.     Personal protective equipment for cleaning and handling.	2	2	4				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				
	HLR	Child labor	illiteracy	Child labor (blow 18 years age) are strictly prohibited.     Verification of age by CNIC.     Human/ Labor Right Policy (SOP-0423)	1	1	1					
		P	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire & Explosion     Product loss	Insulated electrical supply/ connection     Covered D. B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PPEs (Shock resistant gloves and safety shoes)     Safety signages     T. ERP SOP     S. Gas detector     Emergency route highlighted with arrows     T. Fire alarm	2	2	4				
		С	Chemical dosing for cleaning purpose (Nitric acid)	Skin burn     Major & minor injury	MSDS     Training of staff     Personal protective equipment ( Chemical coverall, splash goggles, helmet, face mask, rubber gloves & gum boots).     Safety signages	2	2	4				
4	E & C	E & C	Hazardous waste (Chemical container)	Empty chemicals containers, Hazardous waste effects on health (infections & diseases)	Training on chemical handling of staff.     Allocate hazardous waste collection spot.     Personal protective equipment for cleaning and handling.	2	2	4				
		E & C	Effluents/ Waste water	Water polution	Training on chemical handling of staff.     Waste water treatment plant.     Personal protective equipment for cleaning and handling.	2	2	4				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				
		HLR	Staff discrimination	Negative attitudes	Hirring of trained & merit based employees     Grievance mechanism procedure	1	2	2				
		HLR	Child labor	illiteracy	Child labor (blow 18 years age) are strictly prohibited.     Verification of age by CNIC.     Human/ Labor Right Policy (SOP-0423)	1	1	1				

	1	Hazard Type.				Risk	Eval	uati	or	Resi	dual F	tisk
Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	Р	s	R
		P	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire & Explosion     Product loss	Insulated electrical supply/ connection     Covered D. B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PEs (Shock resistant gloves and safety shoes)     Safety signages     Fer SOP     Gas detector     Fer Sop	2	2	4				
		Р	Static charge	Flash fire and explossion	Equipment earthing     Regular inspections of earthing     Fire extinguisher/ Sand buckets.     Safety signages	1	2	2				
5	Alcohol Storage	P & C	Alcohol leakage/spillage, toxicity	Respiratory failure, blindness.     Product loss	Dike wall installed     Daily storage tanks and piping visual inspection.     Gas detector     Storage monitoring     No skmoking safety signage     Tanks visual inspection     PPEs (Face Mask)	1	2	2				
		P, C & E		May contaminate air quality, groundwater	Ventilate the area if a spill occurs     Waste water treatment plant	1	2	2				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				

	]	Hazard Type.				Risk	Eval	uatio		Re	sidua	al Risk
Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	S	i R
		Р	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire & Explosion     Property loss     Product loss	Insulated electrical supply/ connection     Covered D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PPEs (Shock resistant gloves and safety shoes)     Safety signages     Tening record     Emergency route highlighted with arrows     Fire alarm	2	2	4				
		Р	Static charge	Flash fire and explossion	Equipment earthing     Regular inspections of earthing     Fire extinguisher/ Sand buckets.     Safety signages	1	2	2				
		P	Fall of person from bowser	Permanent disability.     Minor & major injuries.     Fatality.	Use ladder     PPEs     Work at height training record.	2	2	4				
6	Alcohol Dispatch	Р	Falling object	Head and body part injury.	Keep safe distance.     Use PPEs (Safety helmet, shoes and gloves)     Falling object safety signages	2	2	4				
		P & C	Alcohol leakage/spillage, toxicity	Respiratory failure, blindness.     Product loss	Visual inspection of bower before filling.     Equipment earthing     Regular inspections of earthing     Fire extinguisher/ Sand buckets.     No skmoking safety signage     PPEs (Face Mask)	1	2	2				
		P, C & E		May contaminate air quality, groundwater	Ventilate the area if a spill occurs     Waste water treatment plant	1	2	2				
		E	High noise	Chronic effects ears, hearing loss.	PPEs (Use of ear plugs to prevent from hearing loss)     Ear protection safety signages.	2	2	4				
		F	Foreign particles during filling	Product may contaminate due to dust, pest & hairs etc.	1. Cleaning of equipment surface, dispatch hose. 2. Maintain pest control 3. Use PPEs (Hair & Beard net, Face mask) 4. Avoid jewelry	1	2	2				

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Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	5	R	Additional Controls	P	s	R
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2	2				
6	Alcohol Dispatch	HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2	2				
		E&P	Biogas gas leakage	Fire     Product loss     A. Damage to environment ( air pollution)	1. Regular maintenance of the biogas plant and its components. 2. Gas detector 3. Fire alarm 4. Install wind sock. 5. Emergency route highlighted with arrows 6. Fire extinguisher/ Sand buckets. 7. Safety signages 8. PPES	2	2	2	4				
		E & C	Effluents/ Waste water	Water polution	Waste water treatment plant.	2	2	2	4				
		E	High noise	Chronic effects ears, hearing loss.	PPEs (Use of ear plugs to prevent from hearing loss)     Ear protection safety signages.	2	2	2	4				
7	Biogas Plant	P	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire & Explosion     Product loss	Insulated electrical supply/ connection     Covered D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PPEs (Shock resistant gloves and safety shoes)	2	2	2	4				
	Biogas Plant	P	Unguarded rotary parts (Drives gears, motor belts, pumps & blowers)	Worker may entangled into rotatory parts.  1. Permanent disability.  2. Minor & major injury.	Loose cloths & kerchief are not allowed     Safe guard of rotatory parts.	1	3	3	3				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2	2				
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2	2				
		HLR	Child labor	Accidents / suffer education / illiteracy	Child labor (blow 18 years age) are strictly prohibited.     Verification of age by CNIC.     Human/ Labor Right Policy (SOP-0423)	1	1	L	1				

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Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	s	R
		E	High noise	Chronic effects ears, hearing loss.	PPEs (Use of ear plugs to prevent from hearing loss)     Ear protection safety signages.	2	2	4				
		P	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire	Insulated electrical supply/ connection     Covered D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.     PPEs (Shock resistant gloves and safety shoes)     Safety signages	2	2	4				
		С	Biocide Dozing	Product may contaminated due to biocide dozing	COA	2	2	4				
8	CO <sub>2</sub> Plant  E & C  B  HLR	E & C	Effluents/ Waste water.	Water polution	Waste management SOP     Internal & external analysis report/ record     NEQ record.	2	2	4				
		В	Raw water	Presence of impurities and contaminants	COA Use treated water	1	2	2				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				
	-	HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				
		HLR	Child labor	Accidents / suffer education , illiteracy	Child labor (blow 18 years age) are strictly prohibited.     Verification of age by CNIC.     Human/ Labor Right Policy (SOP-0423)	1	1	1				
9	Boiler Operation	E & P	Biogas gas leakage	Fire     Product loss     Damage to environment (     air pollution)	Regular maintenance of the boiler and its components.     Gas detector     Fire alarm     Emergency route highlighted with arrows     Fire extinguisher/ Sand buckets.     Safety signages     PPES     Proper supervision & system monitoring	2	2	4				
		P	Boiler tube & piping leakage	Process interrupt, steam generation reduction.	Proper inspection & maintenance of boiler tubes & piping.     Boiler drum level control by automation	2	2	4				

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Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	s	R
			Burning of Bagasse	May effect on GHG	Flue gas control system.     Emission test report.     Wet scrubber	2	2	4				
		E & C		Respiratory problems due to bagasse dust, fly ash and methane leakage	Use of Dust mask	2	2	4				
	_	Ε	High noise.	Noise pollution, Chronic effects ears, hearing loss.	Proper maintenance of equipments & lubrication to reduce noise.     Personal protective equipment (Use of ear plugs to prevent from hearing loss).     S. Ear protection safety signages.     A. Area noise record.	2	2	4				
		P	Confined space works  1. Excessive heat  2. Unauthorized person.  3. Electrocution.  4. Hot surface  5. Improper lighting	Permanent disability.     Minor & major injuries.     Slip / trip & fall .     Skin burns	1. Unauthorized Person Entry is prohibited. 2. Entry prohibited until surface temperature cool down. 3. Take breaks within each 1 hour. 4. Conduct confined space training with work force and share the hazards. 5. Ensure safe access and egress. 6. LOTO must be ensured if required. 7. Use proper specific PPEs.	2	2	4				
9	Boiler Operation	Р	Unguarded rotary parts (Drives gears, motor belts & sprockets)	Worker may entangled into rotatory parts.  1. Permanent disability.  2. Minor & major injury.	Loose cloths & kerchief are not allowed     Safe guard of rotatory parts.	1	3	3				
		С	Chemical dosing (Caustic soda)	Skin burn     Major & minor injury	MSDS     Training of staff     Personal protective equipment ( Chemical coverall, splash goggles, helmet, face mask, rubber gloves & gum boots).     Safety signages	2	2	4				
		E & C	Hazardous waste (Chemical bags)	Empty chemicals bags, Hazardous waste effects on health (infections & diseases)	Training on chemical handling of staff.     Allocate hazardous waste collection spot.     Personal protective equipment for cleaning and handling.	2	2	4				
		Р	Steam, hot water leakage & hot surface.	Skin burn     Major & minor injury	Proper inspection & maintenance record of boiler tubes & piping.     Safety signages     PPEs	2	2	4				
		HLR	Harassment	Employee turnover	Hiring of trained employees     Grievance mechanism procedure	1	2	2				Ш
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				

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Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	P	s	R	Additional Controls	P	s	R
		E	Air pollution	Respiratory problems due to bagasse dust	Use face mask	2	2	4				
		Р	Bagasse spreading & exposed to workers.	Eye irritation	Use eye protection	2	2	4				
10	Bagasse storage	P P	Hot Jobs/ fabrications  1. Spark, spatter, particles, naked flame.  2. Hot surface.  3. Welding Light & Radiations.  4. Smoke produced by Welding.  5. Electrocution.  6. Grinder disc & Drill bit broken  Smoking near bagasse	Minor & major injury (burns ).     Fire / explosion.     Eye damaged/ Irritation.  Risk of major fire	1. Housekeeping (Area cleaning check list) 2. Welding area covered. 3. Use proper PPE's face shield, welding hood, goggles, heavy duty gloves & safety shoes. 4. Safety signages. 5. Air ventilation. 6. Keep fire extinguisher/ sand bucket. 7. Training of workers. 8. Check list of grinder tool. 9. Working floor dry to avoid electrocution. 1. Area cleaning checklist. 2. Energized fire hydrant system. 3. Fire extinguisher placed/ sand bucket. 4. Fire watch. 5. Close monitoring at bagasse storage. 6. Safety signages	2	2					
		HLR	Harassment	Employee turnover	7. No smoking area 1. Hiring of trained employees 2. Grievance mechanism procedure	1	2	2				
		HLR	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees     Grievance mechanism procedure	1	2	2				
	Power Generation	Р	Electric shock/ Short circuit	Electrocution     Minor & Major injuries.     Fire	Insulated electrical supply/ connection     Covered D.B/ Panel     Inspection records     Fire extinguisher/ Sand buckets.	2	2	4				
11		р	Fall of load & Overhead crane failure, pinch point.	Minor & Major injuries.     Property loss.     Permanent disability.	3rd party certification of crane.     3rd party certification of lifting accessories.     3. ard party certify operator and rigger.     4. Tag line to control the load movement.     5. Safety signages.     6. PPEs	2	2	2				

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Sr No	Activities/ Processes	Physical (P), Chemical (C), Biological (B), Food Safety (F) Environment (E), Human & Labor Rights (HLR)	Hazards	Hazard Effect/ Risk	Existing Controls	Р	s	R	Additional Controls	Р	s	R
			Turbine tripping	Steam turbines operation	Maintain set point of Lubrication oil.							
		Р		tripping / power cut off ,	Prevent overload by maintaining electrical equipments.	2	2	4				
				plant shut down							<u> </u>	
			High noise.	Noise pollution, Chronic	1. Proper maintenance of equipments & lubrication to reduce							
			effects ears, hearing loss.	noise.								
	Power	F			2. Personal protective equipment (Use of ear plugs to prevent	2	2	4				
11	Generation	L.			from hearing loss).	_	-	Ι.				
	oeneration				3. Ear protection safety signages.							
	HLR			4. Area noise record.						<u> </u>		
		Harassment	Employee turnover	1. Hiring of trained employees	1	2	١,					
		FILK			2. Grievance mechanism procedure						<u> </u>	
		шв	Staff discrimination	Negative attitudes	Hiring of trained & merit based employees	1	2	2				
	HLR			2. Grievance mechanism procedure	1	_	2			<u> </u>		

Reviewed On	13-01-2020	Food safety related risks and opportunities added
Reviewed On	01/10/2022	ISO 9001: 2015, ISO 22000:2018, PS 3733:2019 and Certification process of Bonsucro production standard (V-5.1) & Chain of custody standard (V-5.1)

Probability X Severity = Risk Rating (6 to 9 = High) (3 to 4 = Medium) (1 to 2 = Low) P: Probability

S: Severity R: Risk

Prepared by Amin Ullah Memon Dy. Manager HSE

Reviewed & Approved by Mr. Israe Hussain

Director Production & M.R