

ETP PLANT FAILURE MODE AND EFFECTS ANALYSIS (PROCESS FMEA)

Sr.No	Process Function/ Requirement	Potential Failure mode	Potential effects of failure	Severity	Potential Cause(s) / Mechanism(s) of failure	Current Process controls, prevention	Occurrence	Current Process controls detection	Detection	Recommended action	Responsibility
1	EFFLUENT COLLECTION TANK	1. Electricity Failure 2. Tank Over flow 3. Effluent transferring Motor Malfunction, Pump/Choke up/ Broken 4. Mixing of Rain Water in effluent. 5. Inlet effluent parameter beyond design basis. 6. Seepage of tank in to ground.	1. Overflow 2. Land Pollution 3. Treated water quality standard deteriorate	H	1. Operators negligence 2. PM of Motor not done as per schedule.	1. Daily monitoring by operator & weekly cleaning of football ready condition 2. Standby pump in additional collection tank. 5. Analysis inlet Effluent parameter as per scheduled.	Monthly	1. Visual & manual 2. Record maintained in Logbook	Daily	1. PM as per procedure.	Supervisor, Chemist, Operator & Maintenance team
2	NEUTRALISATION TANK	1. Dosing not proper 2. dosing chemicals non availability 3. Conc. Of solution not as per standard dosing. 4. mixing air stoppage	1. Physico chemical Parameters disturbed 2. Coagulation and flocculation not being done	H	1. Operator Negligence. 2. Mechanical failure	1. Daily monitoring by operator	Daily	1. Visual & manual 2. Record maintained in Logbook	Daily	1. Trained operator 2. Auto Dosing set up required	Operator & maintenance team
3	PRIMARY TUBE SETTLER	1. Poor Settling. 2. operation of high feed. 3. timely sludge removal not done	1. Turbid appearance at filter feed tank which increased the load of Filters. 2. Overflow 3. Tube chock up lead to improper settling and sludge overflow	M	1. Operator Negligence	1. Daily monitoring by operator 2. Proper Cleaning	Daily	1. Visual & Manual	Daily	1. Trained operator	Operator
4	FILTER FEED TANK	1. Electricity Failure 2. Tank Over flow 3. Motor Malfunction, Pump/Choke up/ Broken 4. Mixing of rain water	Overflow, Land Pollution	H	1. Operators negligence 2. PM of Motor not done as per schedule.	1. Daily monitoring by operator & weekly cleaning of football ready condition 2. Standby pump in additional collection tank	Daily	1. Visual & manual 2. Record maintained in Logbook	Daily	1. PM as per procedure.	Operator & maintenance team
5	SAND FILTER	1. Bypass the filtration 2. Filter Chock up/Clogged 3. Leakage	1. Due to backwash not done 2. Media not changed 3. Valve ,Piping or vessel damages 4. TSS will increased	M	1. Backwash not done timely. 2. Operators negligence	1. Daily monitoring by operator 2. Timly backwash record maintained in logbook	Daily	1. Visual & Manual	Daily	1. Timely filter media replacement. 2. Trained operator	Operator & maintenance team
6	SAND FILTER	1. Water Quality Deteriorate. 2. Filter Chock up/Clogged 3. Leakage	1. Due to backwash not done 2. Media not changed 3. Valve ,Piping or vessel damages 4. Clour and odour appear.	M	1. Backwash not done timely. 2. Operators negligence	1. Daily monitoring by operator 2. Timly backwash record maintained in logbook	Daily	1. Visual & Manual	Daily	1. Timely filter media replacement. 2. Trained operator	Operator & maintenance team
7	TREATED WATER TANK	1. Electricity Failure 2. Tank Over flow 3. Motor Malfunction, Pump/Choke up/ Broken 4. Treatment of effluent not done properly	1. Overflow 2. Land Pollution 3. Treated water quality standard deteriorate (consent violation)	H	1. Operators negligence 2. PM of Motor not done as per schedule.	1. Daily monitoring by operator & weekly cleaning of football ready condition 2. Standby pump in 4. Transfer to CETP 5. Analysis of treated Effluent parameter by MnFF I ah	Daily	1. Visual & manual	Daily	1. PM as per procedure.	Operator & maintenance team

ENDURANCE TECHNOLOGIES LTD, L6/3 PLANT

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8	SLUDGE DRYING BED	<ol style="list-style-type: none"> Excess Feed Ingress of Rain Water Grit Chocking/ Bed media clogged 	<ol style="list-style-type: none"> Overflow followed by land Moisture Contain in dry sludge 	L	<ol style="list-style-type: none"> Operators negligence 	<ol style="list-style-type: none"> Daily monitoring by operator Timely removal of dried sludge. Timely disposed waste sludge to CHWT/SDF 	Monthly	<ol style="list-style-type: none"> Visual & manual 	Daily	<ol style="list-style-type: none"> Closed monitoring while Sludge draining Removal of Sludge on time. 	Operator

ETP PLANT FAILURE MODE AND EFFECTS ANALYSIS (PROCESS TIME)

Sr.No	Process Function/ Requirement	Potential Failure mode	Potential effect(s) of failure	Severity	Potential Cause(s)/ Mechanism(s) of failure	Current Process controls /prevention	Occurrence	Current Process controls detection	Detection	Recommended action	Responsibility
1	EFFLUENT COLLECTION TANK	1.Electricity Failure 2.Tank Over flow 3. effluent transferring Motor Malfunction, Pump/Choke up/ Broken 4. Mixing of Rain Water in effluent. 5. Inlet effluent parameter beyond design basis. 6. Seepage of tank in to around	1. Overflow 2. Land Pollution 3. Treated water quality standard deteriorate	H	1.Operators negligence 2. PM of Motor not done as per schedule.	1. Daily monitoring by operator & weekly cleaning of football 2. Standby pump in ready condition 4. Transfer to additional collection tank. 5. Analysis inlet Effluent parameter as per scheduled	Monthly	1. Visual & manual 2. Record maintained in Logbook	Daily	1. PM as per procedure.	Supervisor, Chemist, Operator & Maintenance team
2	AERATION TANK-1	1. Air blower failure 2. Level sensor malfunction. 3. Diffuser blocked/clogged	1. bacterial Oxygen deficiency occurred. 2. Active biomass deteriorate. 3. Overflow	H	1. PM not done as per procedure 2. Standby pump not available 3. Electricity failure.	1. Daily monitoring by operator 2. Stand by pump is used alternate day	Daily	1. Visual & Manual	Daily	1. PM as per procedure 2. trained operator	Operator & maintenance Team
3	AERATION TANK-2	1. Air blower failure 2. Level sensor malfunction. 3. Diffuser blocked/clogged	1. bacterial Oxygen deficiency occurred. 2. Active biomass deteriorate. 3. Overflow	H	1. PM not done as per procedure 2. Standby pump not available 3. Electricity failure.	1. Daily monitoring by operator 2. Stand by pump is used alternate day	Daily	1. Visual & Manual	Daily	1. PM as per procedure 2. trained operator	Operator & maintenance Team
4	FILTER FEED TANK	1.Electricity Failure 2.Tank Over flow 3.Motor Malfunction, Pump/Choke up/ Broken 4.Mixing of rain water	Overflow, Land Pollution	H	1.Operators negligence 2. PM of Motor not done as per schedule.	1. Daily monitoring by operator & weekly cleaning of football 2. Standby pump in ready condition 4. Transfer to additional collection tank	Daily	1. Visual & manual 2. Record maintained in Logbook	Daily	1. PM as per procedure. 2. Trained operator	Operator & maintenance team
5	SAND FILTER	1.Bypass the filtration 2. Filter Chock up/Clogged 3. Leakage	1. Due to backwash not done 2. Media not changed 3. Valve ,Piping or vessel damages	M	1. Backwash not done timely. 2.Operators negligence	1. Daily monitoring by operator 2. Timly backwash record maintained in logbook	Daily	1. Visual & Manual	Daily	1. Timely filter media replacement. 2.Trained operator	Operator & maintenance team
6	SAND FILTER	1. Water Quality Deteriorate. 2. Filter Chock up/Clogged 3. Leakage	1. Due to backwash not done 2. Media not changed 3. Valve ,Piping or vessel damages 4. Clour and odour appear.	M	1. Backwash not done timely. 2.Operators negligence	1. Daily monitoring by operator 2. Timly backwash record maintained in logbook	Daily	1. Visual & Manual	Daily	1. Timely filter media replacement. 2.Trained operator	Operator & maintenance team
7	TREATED WATER TANK	1.Electricity Failure 2.Tank Over flow 3.Motor Malfunction, Pump/Choke up/ Broken 4. Treatment of effluent not done properly	1. Overflow 2. Land Pollution 3. Treated water quality standard deteriorate (consent violation)	H	1.Operators negligence 2. PM of Motor not done as per schedule.	1. Daily monitoring by operator & weekly cleaning of football 2. Standby pump in ready condition 4. Transfer to CETP 5. Analysis of treated Effluent parameter by MoEE Lab	Daily	1. Visual & Manual	Daily	1. PM as per procedure.	Operator & maintenance team
8	SLUDGE DRYING BED	1. Excess Feed 2. Ingress of Rain Water 3. Grit Chocking/ Bed media clogged	1. Overflow followed by land 2. Moisture Contain in dry sludge	L	1.Operators negligence	1. Daily monitoring by operator 2. Timely removal of dried sludge. 3. Timely disposed waste sludge to CHWTSDF	Monthly	1. Visual & manual	Daily	1. Closed monitoring while Sludge draining 2. Removal of Sludge on time.	Operator