



Avoiding Run to Failure- Development of a Program for Wastewater Treatment Plant Preventative Maintenance Standardization

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Jeff Buchanan, CSX Transportation
Erica Adair, Ramboll Environ

Mission of PM & RI Program

Develop a Preventative Maintenance (PM) and Routine Inspection (RI) program that:

- Meets the needs of each facility
- Contains standardized documentation that can be applied across the CSXT Network
- Successfully utilized by personnel with diverse experience and knowledge
- Reduce RUN TO FAILURE

Goals of PM&RI Program

- Extend useful life of equipment
- Avoid or mitigate consequences of equipment failure
  - Unnecessary rapid response situation
  - Additional costs for non-routine maintenance
- Provide:
  - List of wastewater assets for each location
  - Consistent PM approach for all locations
  - PM schedule and repair tracking
- Create:
  - Budgeting for predictable replacements
  - Proactive PM scheduling
  - Reduced risk of failure, upsets or spills

Rail Industry Wastewater Treatment Plant PM & RI Challenges

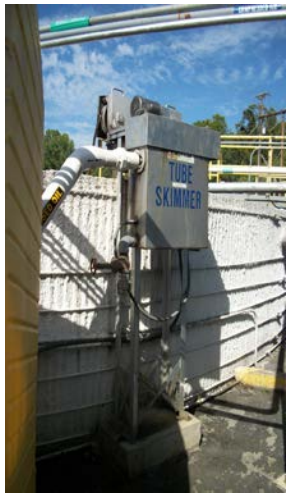
- Operate wastewater treatment facilities across a large geographical network.
- Limiting weather conditions.
- Age of facilities vary.
- Many plants are attended less than full time.
- Experience and knowledge level varies at each facility.
- Each location develops own PM&RI practices and documentation. Varying detail and understanding.
- Union facilities vs non-union facilities; in-house maintenance vs outside contractors.

PM & RI Project Scope

- Develop PM and RI documentation:
  - Photo Log
  - Equipment List
  - Equipment Routine Inspection
  - Preventative Maintenance Schedules
    - Monthly
    - Quarterly
    - Annual
- Develop Process Flow Schematic
- On-site review of current PM documentation at piloted CSXT Yards.
- Develop information in a format that could interact with electronic management in the future.

PM & RI Documentation

Photo Log



- Major equipment & instrumentation
- Point of reference
- Description of use or auto control

- Geographical location
- Specific equipment information
- General overview of site

Equipment List

EQUIPMENT LIST

Equipment Name/ID	Equipment Tag No.	Manufacturer	Model No.	Serial No.	Other		
OWS Belt Skimmer		Tenco Hydro Inc., Brookfield, IL	TS-124	6412			
OWS Blower							
OWS Sump Pump							
Belt Skimmer Oil Tank	T-43				2000 gal	Known as North or South Used Oil Tank	
Rotary Pipe Skimmer Tank	T-44				2000 gal	Known as North or South Used Oil Tank	
OWS Skimmer Box							
OWS Used Oil Box							
Screw Auger Assembly			92040-11	R73R42DT80N4	8500540472	S5002	
Screw Auger Grit Pump		Sandpiper	H8DF2DB5A	972489			
Rotary Pipe Valve and Filter							
Primary Used Oil Pump (orange)		Wilden	04-5000-01				
Secondary Used Oil Pump (silver)						2" suction/2" discharge	
OWS Lift Station Pump	6006/#10	Morris Pumps, Inc. Baldwinsville, NY	4VJC14	M-22158	local start/stop		
OWS Lift Station Pump	6007/#11	Morris Pumps, Inc. Baldwinsville, NY	4VJC14	M-22159	local start/stop		

- Equipment ID
- Equipment Tag No.
- Manufacturer
- Model No.
- Serial No.
- Other maintenance specific information

Equipment Routine Inspection

EQUIPMENT INSPECTION LOG SHEET

ompleting inspections.
bservations.
ns, Corrective Actions, and Comments ".
(marked as "No"), notify maintenance and ma

	Task	Yes/ No	Date	Operator Initials	Observations, Corrective Actions
Influent Head Works	Is the bar screen free of debris? If not, clear bar screen.				
	Is the influent bypass valve free of leaks?				
Oil Water Separator (OWS) and Belt Skimmer	Is the OWS free of debris?				
	Is the skimmer motor free of vibration and unusual sounds?				
	Is the skimmer box float assembly free of debris?				
	Is the OWS blower motor free of vibration and unusual sounds?				
	Is there sufficient air movement across the OWS?				

Structured to follow Process Flow

Y/N Format for easy identification of issues

Frequency Determined by Site Personnel

Easy use for personnel with varied knowledge

- Equipment ID
- Task/Inspection Item
- Date of Inspection
- Operator Initials
- Observations
- Corrective Actions

PM Schedules

MONTHLY PREVENTATIVE MAINTENANCE SCHEDULE

Month _____

Instructions:
Complete each task.
Document actions, observations, and comments.
Document any findings and notify management of any findings that cannot be addressed during normal maintenance activities.

Monthly, Quarterly, Annually

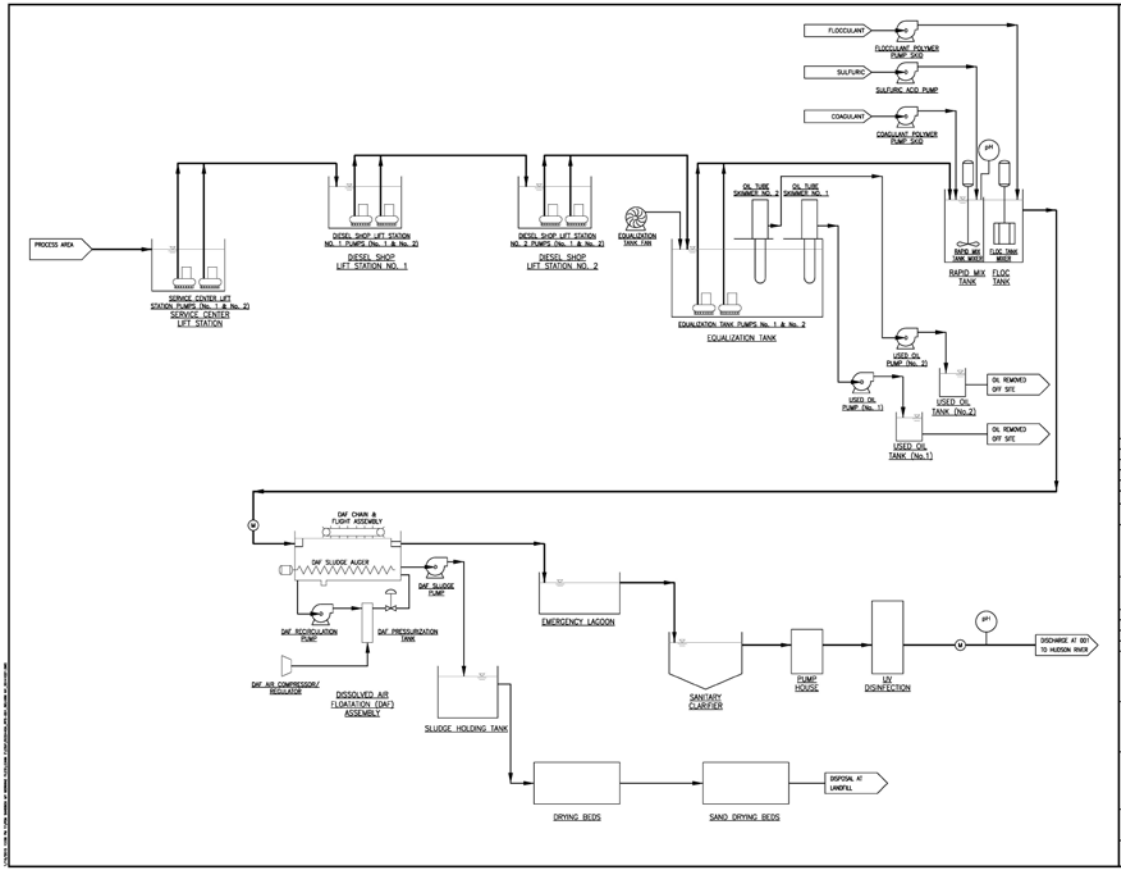
Equipment Name/ID	Date	Mechanic Initials	Electrician Initials	Pipefitter Initials	Actions, Observations Comments
Influent Head Works					
Exercise Bypass Valve: note initial position, turn 100% open, turn 100% closed and then return valve to the original position.					
Lubricate the valve if the valve has a difficult time turning. Use lubricant recommended by manufacturer. Note if lubricant was necessary (write Y or N).					
Inspect for leaks. Are any present? (write Y or N) If so, correct the issue.					
Oil Water Separator (OWS)					
Inspect the top of the OWS and remove all debris.					

Allows for each site to identify responsible party

Sufficient room for Comments

- Equipment ID
- Task/Date of Task
- Responsible Party
- Actions, Observations

Process Flow Schematic



- Standardized Equipment Symbols
- Standardized Flow Paths
- Standardized Nomenclature

Project Status-Completed Items

- Standard documentation templates developed
- Operator Training
  - Documentation, data management, maintenance history
- Update O&M Manuals accordingly
  - Archive outdated equipment manuals and documentation
- Ensure access to documentation on-line
  - Documentation available to environmental personnel across the network
  - Encourage idea sharing and continued improvements

Project Status-Remaining Items

- Periodic Audits
  - Ensure PM procedures are being implemented
  - Incorporate into CSXT annual auditing structure
- PM Data Management
  - Trending equipment reliability for repair vs. replace decision
  - Standardize equipment selection for particular applications
- Electronic collection of data
  - Increased staff efficiency

Questions?