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ABSTRACT

IMPROVEMENT STRATEGY FOR REDUCING THE ENVIRONMENTAL IMPACT OF A WASTEWATER TREATMENT PLANT

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Summary

A wastewater treatment plant (WWTP) must be able to operate satisfactorily during critical situations, service shutdowns and power outages. That makes the management of the wastewater plant difficult because of disturbances that can be produce and which are difficult to characterize and predict. The slightest failure is harmful in an environment where performance is paramount. It is therefore necessary to ensure permanently the proper functioning of the wastewater treatment plant toward the objectives assigned to it. In this work, a performance reliability study was conducted on the WWTP of Ain Temouchent, (treatment capacity of 10,920 m^3/day), which was taken as a model for activated sludge WWTPs. The objective of this work is to study some selected parameters such as pH, Temperature, conductivity, Total Suspended Matters TSM, Biological Oxygen Demand BOD, Chemical Oxygen Demand COD, Nitrate NO_3^-, Nitrite NO_2^-, Ammonium NH_4^+, Orthophosphate PO_4^{3-}, Dissolved Oxygen, Total phosphorus, Total Nitrogen in several samples of treated wastewater from the wastewater treatment plant with the application of the Design Failure Mode and Effect Analysis(DFMEA), which allows the STEP system to be disassembled into components and to determine the most sensitive incidents according to their criticality index and prioritize them. The principles failures detected are directly related to the exceeding of pollution parameter concentrations, as well as equipment failures, which lead to anomalies in the unit and in the operation of treatment processes. Based on the results of the DFMEA analysis we proposed solutions to be implemented to improve purification yields and strengthen the plant reliability.

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- ☐ Policy and associated regulations for odour and air quality.
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- ☐ Source characterization and odour/VOC mapping.
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