LOADMON: An online non-contact wastewater pollution Load Monitor

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1. Introduction

Due to the increasing energy prices and labour costs, the waste water industry is seeking to improve the energy efficiency by improving the plant control performance. The advanced control systems for the activated sludge process need the real-time measurements of the organic load of crude and settled sewage, so that the required COD/SS level of discharged wastewater remains, but less power is consumed to pump the air.

Energy Efficiency

- Less energy consumption
- Maintenance costs
- Site visiting
- Energy price
- Labour costs
- Reliable discharges

2. Concept

- Non-contact
- Affordable
- Real-time online
- Reliable
- Monitoring inlet streams to sewage works
- Industrial discharges & pollution control
- Measure SS from IR (linear correlation)
- Measure COD from UV (nonlinear correlation)

3. From theory to practice

- Left: Automatic angle adjustment for varying water levels
- Bottom: Site testing (Apr 2012)

Foams, floaters, waves and turbulences

A maximum likelihood algorithm has been developed which removes the noises due to foams etc., and allows the LOADMON works at various conditions.

4. Results & Conclusion

- Pre-production prototyping
- 6 month field test and evaluation
- Wireless data transmission

A statistic correlation model has been achieved.
A Laboratory prototyping by Matlab/Beagleboard
Good correlation between UV/IR measurements and SS/COD have been demonstrated.

Future work

References

2. Non Contact Monitor links Oxford University and WRc, [online] http://www.wrcplc.co.uk