

EOLI

Efficient Operation of Urban Wastewater Treatment Plants

Contract Number ICA4-CT-2002-10012

Work Package 1

Second Year Report

November 22-24, 2004, Milano, Italy

Task leader:

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Participant partners in this report:

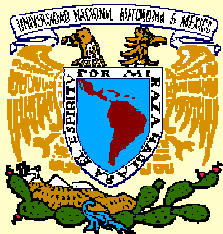
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Activities

■ LBE

Finish the remained experiments for modeling

Data concerning sludge settleability

Study of the sludge COD adsorption was conducted.

■ POLIMI

Finish the remained experiments for modeling

A second SBR plant has been used to check the behaviour of the process with real sewage.

■ UNAM

Replicates for the model

Fault detection experiments

Shock loads of 4-chlorophenol.

Degradation if a mixture of municipal wastewater and phenol

Activities

■ UU

Operation of two laboratory scale SBR reactors loaded with two different dairy wastewaters in an automatic mode

Experiences were conducted in order to evaluate the microbiological population composition, kinetic information, and adsorption of COD.

■ IBTECH

Conclusion of the engineering design for the field scale pilot plant

The construction of the pilot wastewater treatment plant was started

Progress towards achieving objectives

Task & Objectives	Progress towards achieving objectives (Outputs)
<i>WP1</i> <i>Task 1.2 Experiments for evaluation of the mass-balance model developed within the framework of EOLI.</i>	The complete set of experiments were completed by LBE, POLIMI and UU Some replicates and confirmatory experiments were conducted by UNAM
<i>Task 1.3 Evaluation of the optimal control strategy</i>	The evaluation of the optimal control strategy under shock loads was completed at UNAM. The system automatization was done at UU.
<i>Task 1.4 and 1.5 Evaluation of the FDI and supervision algorithms</i>	Four experiments to evaluate the DO sensor behaviour has been conducted at UNAM. Two abnormal conditions of the SBR operation were documented at POLIMI
<i>Task 1.6 Design and construction of the pilot scale plant.</i> .	IBTech concluded the detail engineering of the pilot plant of UNAM in January 2004. The construction is now being carried out and should be finished no later than November 19th, 2004. ENEA (a subcontractor of POLIMI) is now operating a 500L pilot plant used for the validation of the applicability of the on-line titrimetric sensor to the monitoring of SBR systems.



Future work

POLIMI. Factors affecting nitrite build-up, adsorption, monitoring of the pilot-scale SBR at Trebbo di Reno (ENEA), on-line titration field scale testing.

LBE. The software and hardware platform developed within WP8 will be installed in Narbonne. The FDI and supervision systems will be implemented and evaluated with the different algorithms developed in EOLI project. The optimal control strategy will also be tested and evaluated.

UNAM. Evaluation of the ED-TOC strategies degrading a mixture of municipal wastewater and phenol in lab scale, the evaluation of the long-term stability of the system by the application of the ED-TOC strategy and the start-up of the field scale reactor using a mixture of wastewater and phenol.



Future work

UU. Operation of the reactors under different loadings. Changes in cycles phases to reduce the nitrate concentration in the effluent.

IBTECH. During the third year of the project, IBTech will start up the pilot plant and will be in charge of its operation and control. IBTech will integrate the results obtained during the operation of the pilot plant.



List of deliverables

Deliverable No.	Deliverable title	Delivery date
D1.1	Report on the validation of the software sensors and the optimal control law in the pilot plant	T0+27
D1.2	Report on evaluation of the process improvement with the application of the optimal control law: shock loads and the long-term stability of system	T0+34
D1.3	Report on the model selection, parameter identification and validation	T0+34
D1.4	Report on the evaluation of the FDI system	T0+27
D1.5	Report on the evaluation of the supervision system	T0+34
D1.6	Documentation for the implementation, the tuning and the use of the FDI and supervision systems	T0+36
D1.7	Report of the engineering project for the field-scale pilot plant	T0+20



Milestones and expected results

- Pilot plants # 1, 2, 3 and 4 operating with the instrumentation: T0+8
- Operating data sets for model selection and parameter identification: T0+11
- Operating data sets for model validation: T0+14
- Tables of results containing the validation of the software sensor and the optimal control law: T0+14
- Tables of results containing the evaluation of the optimal control law: T0+18
- Tables of results containing the evaluation of the shock loads: T0+24
- Tables of results containing the evaluation of the long-term stability: T0+30
- Field-scale pilot plant with instrumentation: T0+30
- Operating data sets for industrial evaluation: T0+33

