CENTRE DE RECHERCHE PUBLIQUE HENRI TUDOR

AMS-MODSI: ADVANCED MATERIALS&STRUCTURES MODELLING AND SIMULATION UNIT

# PROPOSITION FOR INTERNSHIP

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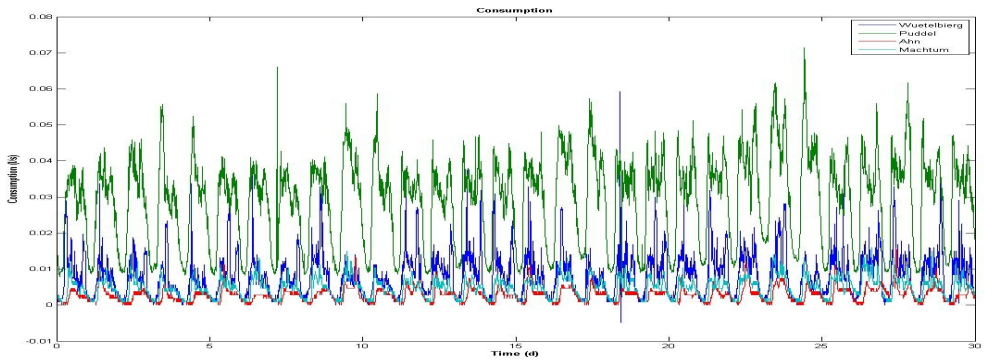
## «Risk Analysis for Water Reservoir»

In order to ensure a good water quality one has to think in addition to water treatments about the complete distribution chain and the related storages where retention period and aeration are crucial topics according to the water quality at end user (customer) level. In Wormeldange system the control of the flow is carried out on hydraulic effect. Moreover, one controls only an inflow volume. Thus low consumption leads to low water exchange in the tank and long retention time for the remaining water volume. Also the aeration in the tank, that is done in an passive approach, is based on daily water volume exchange. Prior to act on the water management it is important to analyse more in details current situation. (it is important to estimate the risk to meet low consumption and thus high risk of quality de at the current day using lastest data)




The water consumption at the stock level is measured in 15 minutes resolution. Based on this data an analysis can be done according to:

1. risk of low aeration with respect to a fixed aeration request, *i.e. to estimate the risk to have no/low water exchange (aeration) based on last-year consumption measurement*;
2. risk of long retention time (more then 3 days) for the remaining water.

The internship will be done at the modelling and simulation unit (MODSI) of Advanced Materials and Structures (AMS) departement.

## BRIEF DESCRIPTION.

The internship consists in analysing the water consumption data of Wormeldange and realize risk analysis in order to avoid poor situations of the control and water exchange. This strategy may be used for improvement of water quality in the further work.

## THE INTERNSHIP WORK-FLOW

The internship will occur data analysis and risk management based on historical consumption data from Wormeldange system.

In the first step a suitable strategy will be developed, i.e., to define a criteria on lower and upper bounds for consumption in a view to meet aeration request and reduce retention time in the tanks.

Second step will cover data and risk analysis due to defined criteria, aeration and retention time of water in the tank.

## THE OBJECTIVES OF THE INTERNSHIP

1. Introduction to research
2. Working on projects in a team
3. Basic knowledges in statistics and data analysis
4. Mastering scientific programming based on MATLAB

## THE DEFENCE

Due to the duration of 4 month of the internship an intermediate presentation will be necessary at the university to finalize the academic year.

The internship will produce a report of the realized work and a presentation of the most important outcomes will be done in-front of the department members.

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