Test Project

Task A3 – Automation in water and wastewater treatment plant

Simulation software – 30 minutes

Water Technology

Submitted by:

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Introduction

Based on the SIMBA software, a slimmed-down software has been developed with which a pre-configured system can be simulated.

The software is designed like a flight simulator, but for water technology. With the help of the software, process engineering sequences can be better understood. In addition, the operator learns skills to be able to react better in the event of a malfunction. All this is done safely and without consequences for real plant operation.

You will be provided with the following main components for the task.

- PC with an installed Demo-version of the SIMBA Software Version 7.

Description of project and tasks

The task in A3 is to supervise a wastewater treatment plant in the control room. Your task will be to determine the deviations from normal operation after a malfunction has been triggered and to react correctly and appropriately to this event. Various measures are available for you to rectify the fault.

Your task:

1. Start the software for task A3.
2. Trigger the fault event.
3. Rectify the fault as efficiently and quickly as possible and within the legal limits for operating a wastewater treatment plant.
4. Document the progress of your work.

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Instructions to the Competitor

1. Start the software for task A3.

- After the project file is loaded and you will see a screen like (Figure 1).
- After double click on "Start", the simulation process of the wastewater treatment begins (Figure 2).

The start configuration is set so that the wastewater treatment plant operates stably with a slightly fluctuating inflow volume (Figure 3). The basic parameter values set for the wastewater treatment plant must not be adjusted for this task!

Note: Read the manual of the Software to understand how to use the software and how to operate the control unit. The Basic overview of the software can be found in (Figure 4).

2. Triggering the event (Start of the task).

- Go under "Alarms" (Figure 4, No. 4).
- Open the Measures area (Figure 4, No. 5).
- Click on "start" at "Generate a Fault - Scenario WSS2026_A3". After the time has elapsed, the error is triggered. The elapsed time can be read in the "Measures applied" area. The events that have occurred are logged in the info/warning/alarm area.

Note: This log is a criterion for awarding points for which faults have occurred and which measures have been taken to keep the system stable and to find or rectify the fault.

3. Rectify the fault as efficiently and quickly as possible and within the legal limits.

To rectify the fault, units can be temporarily set to manual mode, control values can be changed and certain measures can be triggered from the catalog of measures. As the operator of the system, you have many setting options here. It is important to find out which measures are the best.

Goals:

- Use as few points as possible from the catalog of measures but use as many as necessary.
- The plant is to be returned to automated normal operation as quickly as possible.

At the end, there should be no more warnings/alarms. All warnings/alarms have been acknowledged. Let the system run until the end of the task.
Note: Don't stop the process when the task is running. So don't stop or make a break (Figure 4, No. 1 - big mistake!). In a real wastewater treatment plant you can not stop to find a mistake. Also it is not allowed to restart the task.
At the end we will see if you try to manipulate, otherwise you will get 0 points for the whole task.

4. Document the progress of your work

Make a screenshot over the Alarm/Info messages with the snipping tool and save it on the Desktop with the filename "Task_A3 ". The area must look like (Figure 5).

To continue.

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Figure 1. Start screen after loading the Project file 1 - "Start" button.

Figure 2. Start of the wastewater simulation.

Figure 3. Influent to the wastewater treatment plant.

Figure 4. Software overview.

1- Don’t restart or stop the system (Big mistake - No full documentation possible!)
2 - Control area; 3 - Measuring curves; 4 - Alarm messages; 5 - Open/closed the catalog of measures.

Figure 5. Documentation result.

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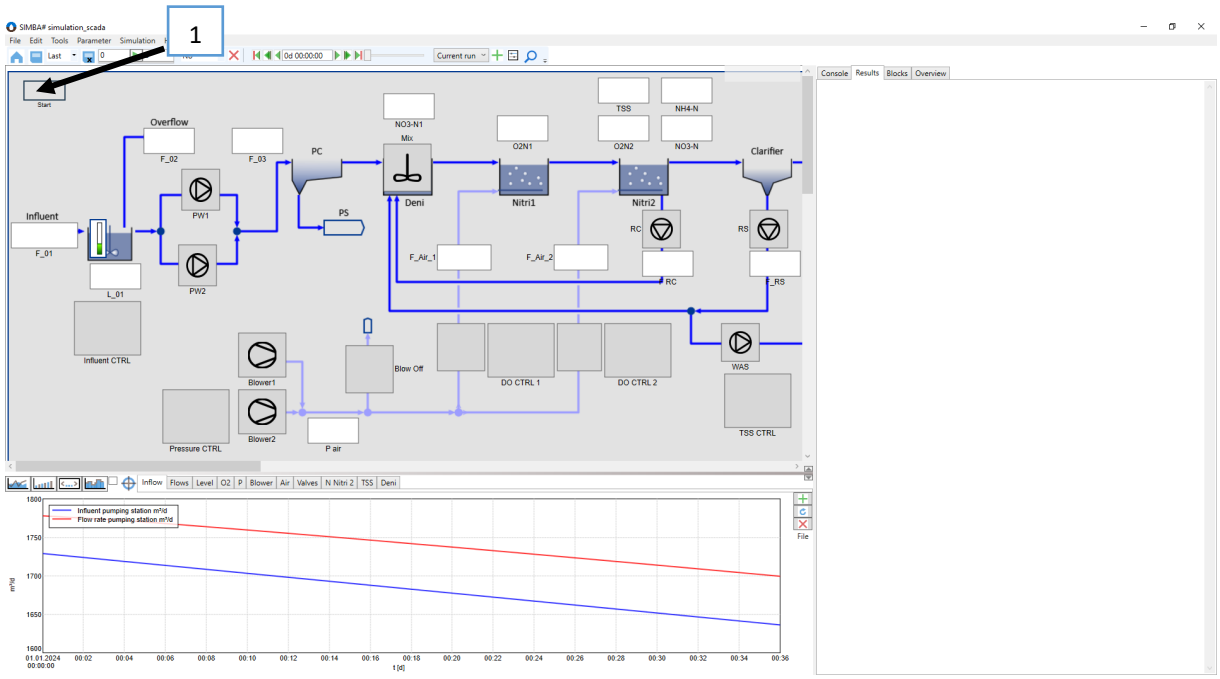


Figure 1. Start screen after loading the Project file 1 - "Start" button.

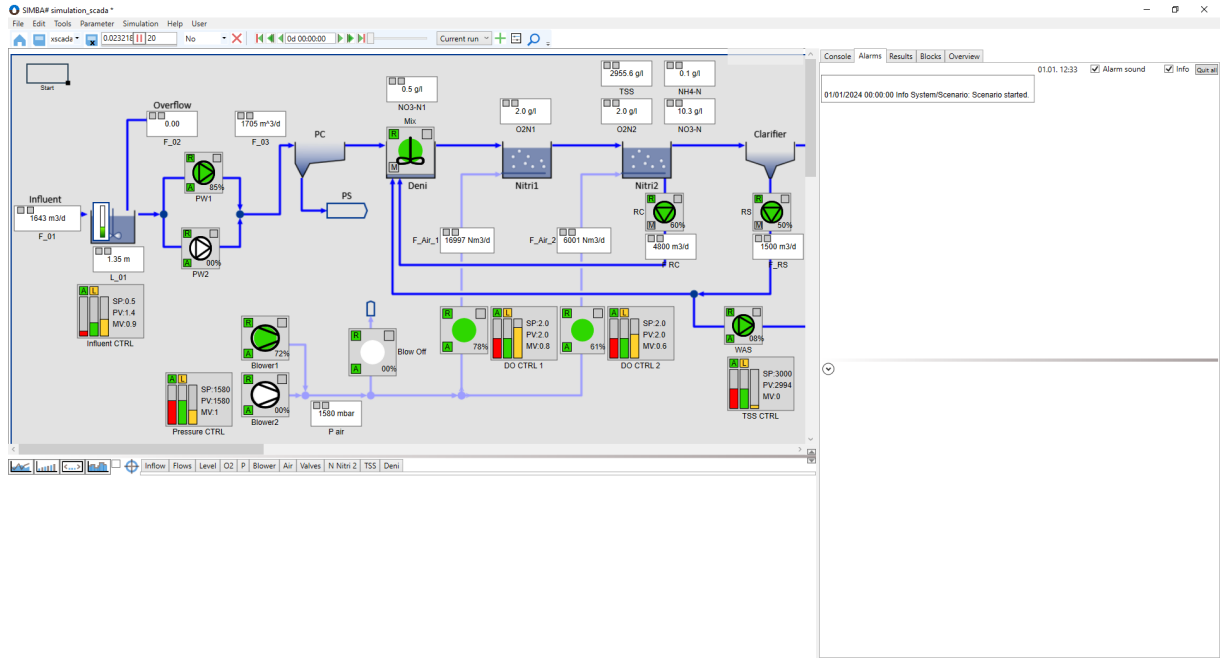


Figure 2. Start of the wastewater simulation.

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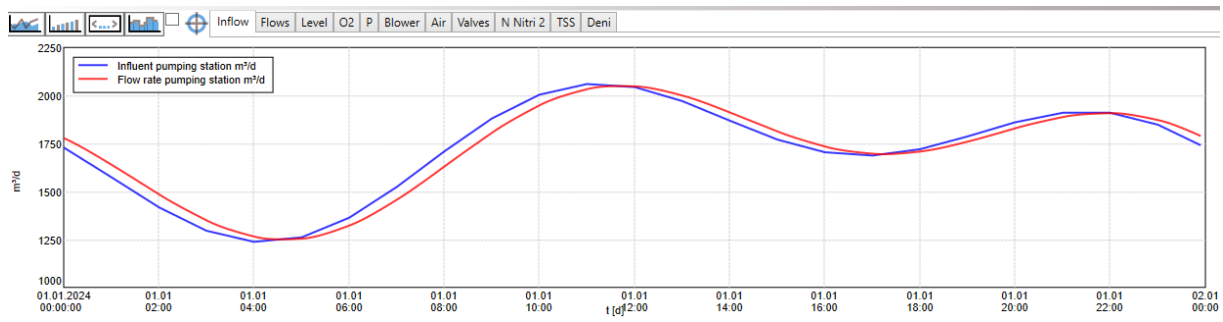


Figure 3. Influent to the wastewater treatment plant.

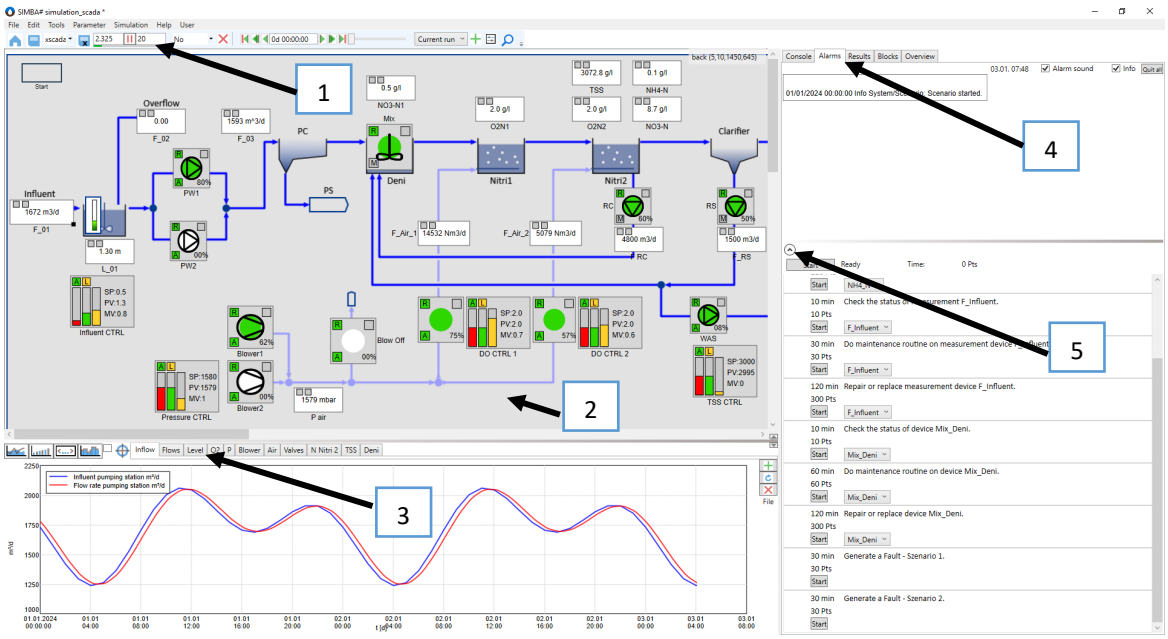


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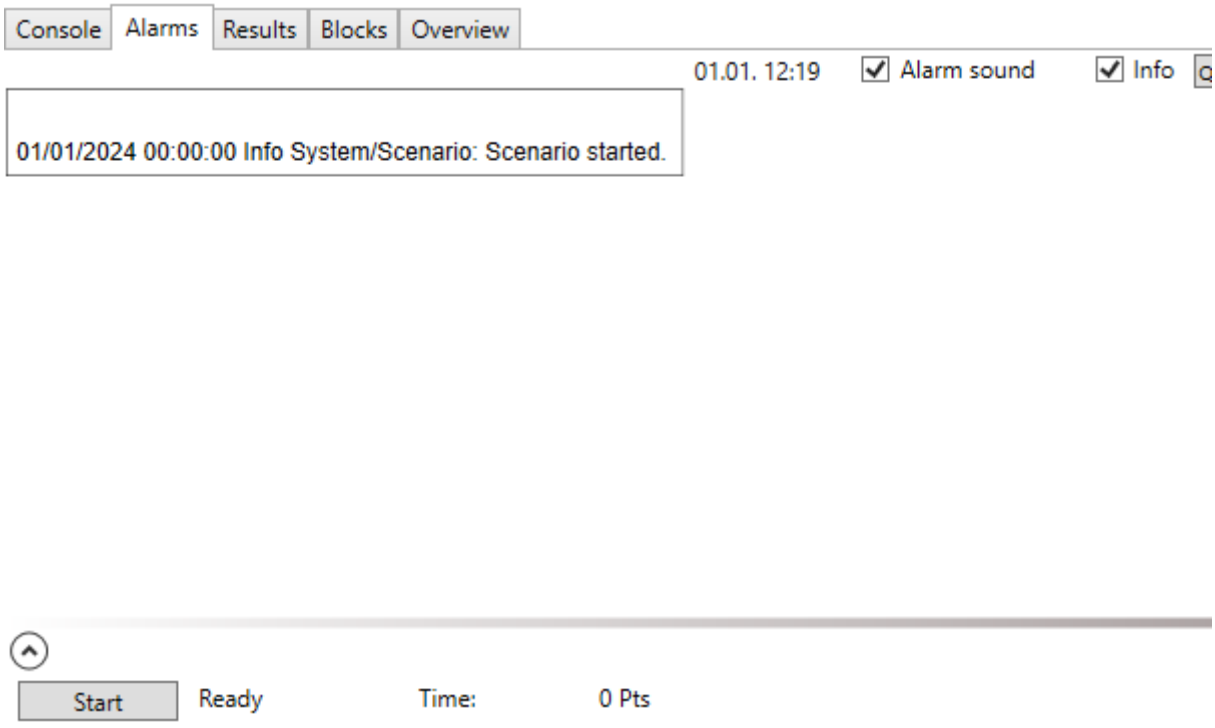


Figure 5. Documentation result.

Task Forms

Country: _____ **Competitor Name:** _____

End Time: _____

Marking Scheme

The task evaluation will be made according to the Competition Information System (CIS) of Water Technology 2026.

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