

AERATION SYSTEM CONTROL, TOLEDO WWTP, BRAZIL

Process and Requirement

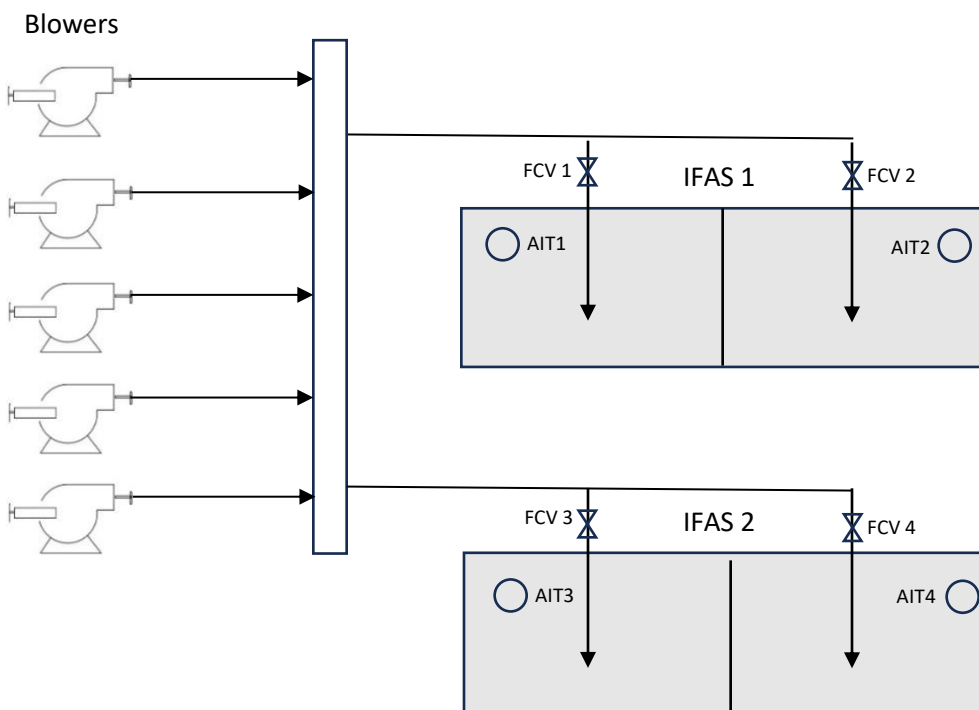
This plant has two treatment lines, each treatment line / Reactor divided into two Stages. Each Stage has its own aeration diffuser system.

Also, the plant has five air blowers, four operating and one reserve, with only one manifold providing air to the four aeration systems.

Without proper automation, the DO will keep changing in each Stage/Reactor as the flow/concentration of the wastewater changes, throughout the day. It will be difficult to maintain good mixing conditions in the Reactors and to achieve an excellent BOD removal (around 95%).

The plan demands low ammonium concentrations in the effluent ($< 5 \text{ mg N-NH}_4/\text{L}$), and the plant cannot maintain this efficiency operating with unstable DO.

The need is to be able to control the DO in each Stage/Reactor.



Automation

To achieve required effluent quality, it is important to have a stable and desired DO in the reactors.

The project involved designing the automation/control system to provide DO control in each Stage/Reactor, with the objective to control the DO in each of the four reactors.

The design provided control of the Blowers, Blower Discharge Valves, and Reactor Control Valves.

Specifically, the project involved providing the following by Engineering and Technology Associates Inc:

- a) Design the P&ID for the air flow system to provide DO control in each Stage/Reactor.
- b) Specify major components (instruments, valves)
- c) Process Control Narrative (design) and HMI (Human-Machine-Interface) details
- d) Assistance to support implementation team to program the PLC and HMI
- e) Assistance to commission the automation system