

Development of Streamlining/Sophistication/Automation Technology for Facilities Operation Management

(Research of FY 2017-2021)

1. Purpose

Wastewater treatment facilities have management issues caused by population decline, further energy saving, and cost reduction. This study deals with ICT, IoT, AI, and robot technology to streamline, sophisticate, and automate the operation management of wastewater treatment facilities.

The research investigates and considers the adaptability to the wastewater business of these innovative technologies introduced to many fields and studies their practical application by joint research with private companies.

2. Outcomes of This Year

(1) Demonstration of facilities' operation management technology using ICT and AI

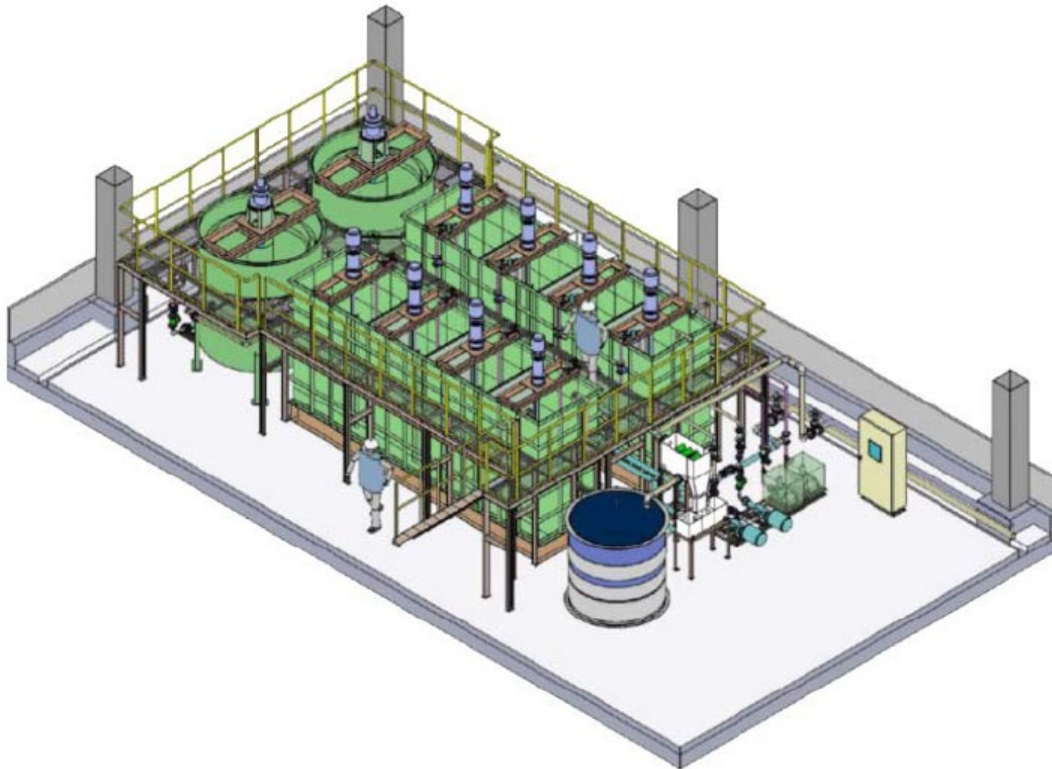
FS was conducted for the following three technologies to demonstrate at the actual scale facilities and verify the performance as the follow-up study

- Efficient operation management technology for the wastewater treatment by ICT based process control and remote diagnosis:
Follow-up study of B-DASH demonstration, research period of 2016-2020

- Advanced treatment technology by ICT/AI-controlled single tank denitrification process: B-DASH demonstration, research period of 2020-2020
- AI-based operation management support technology for the wastewater treatment: Feasibility study of B-DASH project, research period of 2019-2021

(2) Developing a new wastewater treatment operation support/control technology using AI

A testing plant was constructed for the activated sludge treatment in JS R&D experimental center. The CAS specifications were considered to demonstrate the AI-based new operation support/control technology for wastewater treatment. While the wastewater treatment process for the testing plant is assumed to be the conventional activated sludge (CAS) process, it can be modified to a biological nitrogen/phosphorus



sludge process experiment plant

removal process, and its reaction tank can be divided into four sections. There shall be two trains for compared verification operation/control between the conventional and AI trains with a treatment capacity of 50m³/day each. Figure 1 describes a conceptional drawing of the experimental plant.

3. Future Schedule

Demonstration of facilities' operation management technology using ICT/AI will continue next year. The demonstration, as mentioned earlier, will start next year regarding the new wastewater treatment operation support/control technology using AI.

Keywords: **ICT, IoT, AI**