



The BASF wastewater treatment plant in Ludwigshafen handles the wastewater from the company's industrial plants as well as sewage from the surrounding towns and municipalities

■ **BASF, Germany**

Innovative Operating Concept

Quick identification of critical process states, process trends, and priorities, as well as reacting purposefully – achieving these goals is no problem for BASF, because the company is now benefiting from a user-friendly and efficient operating concept for plant control systems.

Ludwigshafen, Germany, is home to the largest BASF production site worldwide. The more than 100 million cubic meters of wastewater generated on-site every year are treated in the facility's own wastewater treatment plant. Another 20 million cubic meters come from the surrounding towns and

municipalities. The total volume corresponds to the amount of wastewater that approximately three million persons in private households would generate. In the context of the OPAL 21 project, this treatment plant was to be designed according to the standards of Operational Excellence. To achieve this, says proj-



BASF SE / Hans-Juergen Dörlger

ect manager Dr. Jens Bausa, “modern automation infrastructure and tools” were required, “to support continuous improvement of the process.” Specifically, this meant reducing complexity through standardized and simplified operator interfaces, effective alarm management, and uniform data interfaces.

New requirements

Today’s operating concepts have to match the current situation in modern process plants, in particular the high automation level, the adjusted number of employees, the challenges that go with demographic changes in staff, and the high demands in terms of safety and availability. Operator systems of state-of-the-art control systems such as Simatic PCS 7 support operator performance through a graphical user interface and high-resolution 22-inch screens. In addition, there are enhanced libraries with new process icons for the visualization of operating states.

With the innovative Human Machine Interface PLUS (HMI+) operation and visualization concept, which was implemented in an industrial wastewater treat-

to the plant together with the plant operators. An efficient operation and visualization concept must be based on the latest findings on ergonomics and usability, but it must also be specifically adapted to the workflows of the users. It is therefore imperative to include the plant operators in the development process to make sure that the experience accumulated over years of system use and the valuable associated know-how is incorporated and safeguarded in the design of the control system.

For this reason, a workshop was organized for the BASF employees to introduce them to the functionality and methodology of HMI+. Among other things, it addressed the color concept used, the new hybrid displays, and the task- and topology-oriented presentation of the process-group level.

Transition in three phases

First, the available process charts were discussed with all the participants to identify to what extent they represent the actual processes and support the required operating steps. Higher-level process-group descriptions were created from the insights gained, and the corresponding ideal representation – digital, analog, and/or curve diagram – was determined. This resulted in the level 2 process diagrams that will cover 85 percent of all operating procedures. In the subsequent optimization phase, the plant operators had the opportunity to assess these process diagrams from the user’s point of view and to make additional suggestions for improvement. Afterward, the process visualization was finalized in PCS 7.

During the stepwise DCS migration, the first stage of expansion of the HMI+ project was also completed in the BASF treatment plant in Ludwigshafen. The persons responsible at BASF are highly satisfied with the result: “The active integration of all participants and aspects into the design of the operating graphics led to broad acceptance of the new operating concept.” This opinion is also shared by the plant operators: “We value the clearly displayed process visualization, which, with a few clicks, makes recognizing critical process states, process trends, and priorities easier.” Meanwhile, the HMI+ project has been enhanced and extended to three additional areas of the sewage treatment plant. ■

HMI+ project: key facts

- ▶ Human Machine Interface PLUS (HMI+) project as an add-on to the PCS migration project of the production facility’s sewage treatment plant in Ludwigshafen
- ▶ Upgrade of the operator interface to the HMI+ user interface integrated into PCS 7 in four expansion stages (flue gas washing water treatment, drainage, incineration plant, and biology)
- ▶ Complete operation of the effluent plant from a central measuring station by four plant operators (one per plant section) with the help of only 50 information-oriented process-group representations (level 2 overviews); the 500 conventional process charts support the process operation, for example, for diagnostics.

ment plant for the first time here, Siemens met the high expectations of the BASF Excellency Project OPAL 21 with regard to the optimization of process visualization and operation. A dedicated HMI+ service team develops a visualization solution tailored

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