

## Application: Filtration Equipment

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### Filter Rebuild

*An Iowa treatment plant saves time and money by improving its backwash process*

In early spring 2001, the water superintendent for the city of Eagle Grove, Iowa, asked Siemens Water Technologies to evaluate and present possible upgrade solutions to the gravity filters and controls at the city's drinking water treatment plant.

The existing plant was originally constructed in the mid-1960s. The filtration equipment, which had been supplied by General Filter (now part of Siemens), consisted of four filter cells with silica sand media, water-only backwash and a control panel with manual switches to operate the filters. Little, if any, of the plant's operation was done automatically.

The filtration media was now spent, leading to declining performance and filter run times. The controls were now obsolete, and some parts were no longer available for repair or replacement.

#### Plant Upgrades

After an extensive plant inspection and discussion with the city about its needs, Siemens recommended options for a complete filter rehabilitation. This involved a complete rebuild of the filter cells, including new underdrain systems, replacement washtroughs,

an upgrade to simultaneous air and water backwash technology (the Multiwash filtration system), filter control replacement and general repair and maintenance work on much of the equipment.

The city and Siemens then began tailoring the final rehab to fit the city's budget. The final project included:

- Media replacement;
- Inspection and repair of the existing underdrain system;
- Addition of in-bed airwash grids and baffles

- to accommodate sustained, simultaneous air-water backwash for the Multiwash system;
- Painting of filter cells;
- Some pipe replacement; and
- New controls for automatic filter operation.

Siemens was contracted to perform most of the work on two filter cells, beginning in Fall 2001. This allowed the other two cells to operate and supply water for the city. Siemens' field service personnel performed the media removal and underdrain repair. After the painting contractor painted the cells, Siemens completed the mechanical upgrades by installing the airwash system. The company also added wing baffles to the washtroughs and installed new filter media. The field service crew then repeated this process on the other two cells.

Once the mechanical work was complete, field service personnel began installing the control upgrades. It was decided at this time to incorporate full plant controls into the new system. Siemens was able to include additional communications and operate the entire plant—from well pump to distribution system—from one main control panel.

#### Results

The system was started up in March 2002, well ahead of the summer high-flow months. The total costs stayed within the city's budget, even after adding the full plant controls. Plant operators have been very pleased with the plant upgrade and have continued to add equipment to the control system, allowing them to minimize operating costs.

The in-bed air grids and baffled washtroughs provide air scouring to improve the backwash process, ensuring the cleanest filter bed possible and allowing for more solids storage capacity and longer filter runs. This saves operator time and minimizes wastes and overall treatment costs.

"Automation of the plant control has saved operating time," said Chuck Ehen, former plant superintendent, "and the Multiwash air-water backwash keeps our filters running at peak performance." **WWD**

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The new system started up in 2002 and has saved operator time and treatment costs.