

Healthcare Products Manufacturer integrates technologies to reduce costs, promote gentle global footprint

Real Challenge

A large healthcare products manufacturer in the United States needed to improve its environmental impact while substantially reducing excessive costs associated with municipal discharge and the operation of cooling towers.

The existing purified water system included pre-filtration, activated carbon, two-pass reverse osmosis (RO) units and polishing deionization. It ran in a good manufacturing practices (GMP) environment, and was thus subject to all GMP requirements.

Although the system was operating well and running at technical efficiencies, the size of the system resulted in a nearly continuous waste stream in its seven-day operation period and would experience periods of complete recirculation when the purified water product was not needed, causing unnecessary additional costs. Also, the feed water to the existing system was high in total dissolved solids (TDS), causing the concentrate, or waste stream, of the RO to have a very high TDS level and high conductivity.

Project Goals:

- Reduce the existing waste stream from 64 GPM to 42 GPM continuously
- Reduce waste produced and feed water required for product production to lower costs, increase efficiency and raise the level of environmental stewardship
- Filter 42 GPM of the waste stream to be sent to the cooling tower array
- Improve the water quality to the cooling towers to reduce blow-down and potentially reduce chemical costs associated with cooling tower operation

Real Depth of Solutions

Siemens Water Technologies worked with the manufacturer to plan and design a solution that would meet all project goals, and that could be carefully integrated into the existing infrastructure without disruption or operational risk, eliminating unnecessary and costly downtime. It was designed to also significantly lower the waste stream of the existing water system and produce high-quality feed water to the plant's cooling towers.

A new waste treatment RO system was engineered, built and installed in the facility to achieve these goals. Since it was located outside the GMP boundaries, validation (or revalidation) was not necessary. Additionally, to address the unnecessary continuous recirculation, Siemens designed a system that operated only when needed, and would be shut down/by-passed when not needed by detecting when the waste stream quality was adequate for cooling tower feed. This helped to further increase the efficiency of the waste treatment solution.



Real Depth. Real Impact. Real Reclaim.

Reduction. Reclaim. Reuse.

Water Technologies

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Real Results for Real Impact

The new waste treatment system successfully achieved all of the initial project goals. The waste stream was reduced from 64 GPM to 42 GPM during the seven-day operation period. The treated wastewater that now feeds the cooling towers eliminates 42 GPM of municipal raw water that is otherwise needed. The water quality of the new feed stream to the cooling towers exceeds the water quality of the municipal raw water, reducing blow-down of the cooling towers, improving cooling tower efficiency and lowering the cost of cooling tower operation.

The new system now operates only when needed, lowering the waste disposal and cooling tower feed requirements, with the following results:

- The waste system operates approximately 8 hours per day
- Reduced waste stream by more than 8 million gallons per year
- Reduced plant's waste disposal costs more than \$350,000 per year
- Waste disposal system has ability to operate more frequently if water quality or plant expansion dictates, further increasing the system's return on investment.

The manufacturer is extremely pleased with the process improvements, increased efficiency, lower water needs, lower waste disposal and improved cooling tower operation—all helping to lower costs and improve the company's environmental impact.



Project Profile

- **Application/Goal**
Healthcare manufacturing water treatment technologies integrated for more efficiency
- **Capacity**
64 GPM
- **Commissioned**
2007
- **Key Technologies Selected**
RO and recirculation technologies

Reclaim Approach

Siemens' integrated reduction, reclaim, reuse approach can provide significant cost savings while promoting a gentle global footprint. Water reclaim can be defined as the treatment of a waste stream to produce high-quality water to be fed to another operation within the pharmaceutical facility.

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