xylem
Let's Solve Water

Case study

Deadly Legionnaire's disease outbreak stopped with the help of Xylem

When Legionnaire's disease broke out in Warstein, Germany, more than 150 people were infected and two people died. Xylem was brought in to install a Wedeco ultraviolet system in the city's municipal wastewater treatment plant, which helped to end the outbreak by safely inactivating *Legionella* found in the wastewater treatment plant effluent.

In late summer 2013, hospitals in the German city of Warstein began seeing a surge of patients with Legionnaire's disease. The disease is a potentially fatal form of pneumonia contracted by breathing in small droplets of water contaminated with the *Legionella* bacterium.

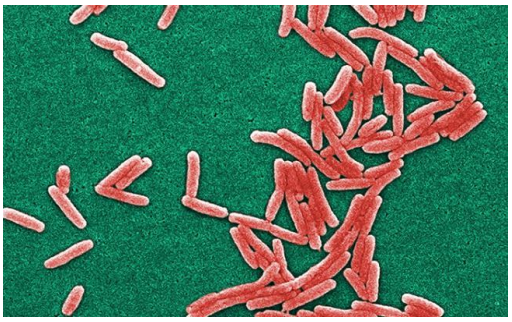
In an attempt to stop the frightening and fast-escalating outbreak, city officials and environmental regulators immediately turned their attention to places which were identified as frequent sources of *Legionella* contamination during various outbreaks worldwide.

Helping to find a solution fast

The *Legionella* pneumophila bacteria thrive in stagnant water, and the first target was an industrial cooling tower that showed traces of the bacteria. The tower was shut down, but the parade to the emergency rooms didn't slow down. Attention quickly turned further upstream to a local wastewater treatment plant. Sure enough, the wastewater plant was emitting water with high levels of *Legionella* into the same river that serves as a source of water for the industrial cooling tower and authorities moved it to the top of the "suspect list."

Suddenly, the phones at Xylem's facility in Herford, Germany, were ringing off the hook. Located just 80 miles from Warstein, the Xylem site manufactures Wedeco ultraviolet (UV) disinfection systems for households, industries and drinking water and wastewater treatment plants.

One call came from consultants, enlisted by regional regulators to help find a solution, who had worked previously with the Herford team on solutions for reducing pharmaceuticals and other micro-pollutants in wastewater treatment plant emissions. A second call came directly from the company that operated the Warstein water treatment plant.



Legionnaire's disease, also known as legionellosis or Legion fever, is a form of atypical pneumonia caused by any type of *Legionella* bacteria. The rod-shaped bacteria grow best in warm water, like the kind found in hot tubs, cooling towers, hot water tanks, large plumbing systems, or parts of the air-conditioning systems of large buildings.

Legionellosis is a potentially fatal infectious disease with a case fatality rate of five to 30 percent. It is acquired by inhaling aerosolized water and/or soil contaminated with the *Legionella* bacteria. It is not airborne and not transmitted from person to person.

Wedeco's Emergency Rental Solution for the municipal wastewater treatment plant in Warstein gave the operators the ability to react quickly on site when high levels of *Legionella* were found in the effluent. Qualified Xylem engineers provided startup of a fully-equipped Wedeco LBX UV disinfection system within one day.

"They were simple and urgent requests: help us find a treatment solution very fast," says Achim Ried, Chief Engineer for Xylem Treatment Solutions. "We had just a little information about the water matrix and the level of *Legionella* in the water, so we did a quick estimation and looked for a system that would be available right away."

The Xylem team knew UV was the way to go. It's a proven technology for disinfecting water and wastewater. Ultraviolet light directed at the water deactivates viruses and bacteria – including *Legionella* – by physically damaging their DNA.

Installation in less than a day

Within the hour, the team located a Wedeco LBX 1000 UV disinfection system in its Herford test site and pulled together a crew of experienced service technicians to deliver and install the system. By this time, the Warstein outbreak had become world news, and the pressure was on to find a fast fix.

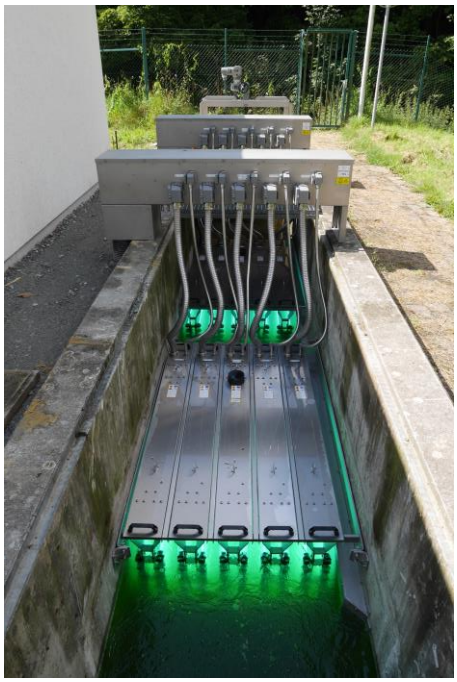
"Usually, it would take weeks to find the right system for the situation and then get it ordered, delivered and installed," says Sven Baldig, managing director of Xylem Services for the Wedeco brand. "But this was a case where quick action was vital, and we responded to the acute needs of the city."

In less than one day – cooperating closely with the wastewater treatment plant operators and communicating with one another constantly – the Xylem business team and service team in Herford had the system in place, with all the water piping and all the electrical connections complete.

The LBX system was working effectively for a full year and was then replaced with the permanently installed Wedeco TAK 55 UV disinfection system. Thanks to the TAK 55 UV system's extensive validation and OptiDose control philosophy, the design was fine-tuned to match local site requirements. This resulted in the smallest possible footprint saving both upfront capital costs and operational costs for the life of the system.

Since this quick fix in early September 2013, there have been no more reported cases of Legionnaire's disease in Warstein. The fast installation of ultraviolet systems from Xylem helped keep this dangerous outbreak from doing even more damage.

The LBX UV system was addressing the *Legionella* issue instantly and treated the effluent effectively for one year. With the rental service the operators gained time to find an appropriate permanent solution.



Warstein awarded Wedeco with the supply of a permanent disinfection solution. The Wedeco TAK 55 UV disinfection system was installed in August 2014, delivering safe wastewater requiring minimal energy and ultimately improving water quality in the River Wester.