

Experience with Comprex netcare at Stadtwerke Steinfurt



Fig. 1: Listening to a gate valve

Source: Hammann GmbH



Fig. 2: Non-closing gate valve, recognizable by the water leakage

Source: Hammann GmbH

Stadtwerke Steinfurt obtains its drinking water from groundwater. The four well fields are located in the area of the Münsterland gravel channel, which was formed during the ice age. The raw water passes through filters filled with quartz gravel several times at the Ahlintel waterworks before it is distributed as drinking water from the pure water tank. The four raw waters contain varying concentrations of iron ranging from 1 mg/l to 40 mg/l. The pumped raw water is analyzed as part of an in-house inspection and by the UKM Institute for Hygiene at the University of Münster. Due to the high iron content, Stadtwerke Steinfurt regularly pigs and flushes its raw water pipes itself.

The water pipeline network has a length of 388 kilometers. It consists of pipes with nominal diameters of DN 50 to DN 400, mainly made of plastic, 7.8 percent of metal and 3.3 percent of other materials. The oldest existing pipeline dates back to 1908.

A few years ago, Stadt-Werke Steinfurt GmbH commissioned Hammann to clean the raw water pipes to the waterworks. The Com- prex process proved its worth as a cleaning measure. The next task was to clean the drinking water network. Here, the decision was made to use Comprex netcare, a combination of pipe network cleaning and maintenance-oriented valve maintenance. This innovative and efficient combination of processes restores pipe networks to a hygienic and hydraulically sound condition and extends the service life of the shut-off valves. The number

of the gate valves to be replaced can thus be significantly reduced [1, 2].

The idea behind Comprex netcare

Most gate valves are open during mains operation. Deposits can build up in the valve body and impair its functionality, causing the valves to close insufficiently or not at all. DVGW Code of Practice W 392 describes the valve inspection. However, the actual shut-off function cannot be determined in this way (Fig. 1). It is only possible to check the shut-off function when the pipe is out of operation, for example before cleaning the pipe network using the Comprex method.

Systematic approach

The valves that limit the pipe section to be cleaned must be closed. At the standpipe of the outlet

hydrants, it is possible to determine whether all actuated gate valves close tightly based on the water discharge. Valves that do not close or close poorly are detected (Fig. 2) and marked (Fig. 3).

Slides that do not close or close poorly are specifically trained by opening and closing them several times, with the release force of the Comprex process providing support where necessary. Between 50 and 70 percent of the gate valves can be trained in this way. As Comprex cleaning takes place after and during the valve repair, it is ensured that all substances that have been loosened and mobilized from the valves are reliably removed from the pipe network (Fig. 4).

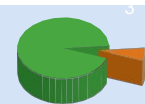
Comprex netcare at Stadtwerke Steinfurt

The idea of using Comprex netcare not only

Table 1: Result of valve inspection and valve rehabilitation

Number of fittings	65 Slider	45 hydrants
of which after valve inspection and functional test	35 of 65 sliders closing 30 of 65 sliders Not completely closing	1 hydrant cannot be found (paved over) 1 hydrant not closing 1 hydrant defective
of which after rehabilitation	23 out of 30 sliders (77 %) upgraded 7 of 65 sliders (11 %) Defective	3 of 45 hydrants not functional

Result



Source: Stadtwerke Steinfurt GmbH and Hammann GmbH

The idea of checking the function of the shut-off valves and, if necessary, upgrading them in order to reduce the expected costs was positively received by Stadtwerke Steinfurt Netz GmbH. There were concerns about possible complaints from customers about the water being shut off or the expected turbidity. For this reason, the feasibility was initially tested in a five-day project. The network service of Stadtwerke Steinfurt GmbH carried out the system maintenance with its own personnel.

The preliminary planning for this operation began in a section of the pipe network consisting of PVC pipes with a length of around 6.4 kilometers. In this section of the pipe network, a small amount of discharge was to be expected. However, the low pressure ratios of around 4 bar were critical, which meant that an increased cleaning time was to be expected. Due to the existing plans for the valve inspection, the preliminary planning could be carried out within one morning. A technician from Hammann and initially five pipe network technicians were

employees from Stadtwerke Steinfurt GmbH's network service were available with two valve turning machines to introduce the process to as many employees in the water pipe network as possible. Usually, the provision of an employee by the supplier is sufficient for Complex netcare.

Starting with an approximately 800 meter long DN 250 pipeline section with 20 valves on the first day, the planned pipe network was completed in 45.5 working hours. The valve inspection and valve rehabilitation led to the result shown in Table 1. The measure resulted in an average daily output of 1,250 meters of pipeline and 22 valves. Of the 30 non-functioning gate valves, 23 could be rehabilitated, meaning that only 7 had to be replaced. This provides data for the costs of the measure:

Costs for replacing a gate valve between EUR 1,000 and EUR 2,500, on average EUR 1,750

Cost savings through retrofitting from 23 sliders	about EUR 40.000,-
Internal costs of the supplier	about EUR 9.500,-
Costs of the Complex cleaning	about EUR 7.000,-

This means that expenses of EUR 16,500 are offset by total savings of EUR 23,500.

Conclusion

Complex netcare is an effective measure for pipe network maintenance based on the combination of pipe network cleaning, valve inspection and valve upgrading. In one area of the pipe network of Stadtwerke Steinfurt Netz GmbH, the cost of joint work by the service provider and utility company was determined and compared with the result of the measure. In this area, around 1.6 percent of the water pipe network, most of the non-functioning gate valves could be upgraded.

Thanks to the preliminary planning and the precise implementation of the plans, the extensive information provided to residents and compliance with all relevant regulations, there was not a single complaint about turbidity, air in domestic installations or other problems. In addition to the extended service life of the shut-off valves, Complex cleaning ensures hygienically perfect conditions in the pipe network.

Literature:

- [1] Pipe network cleaning with valve upgrading; Klein N., Hammann H.-G., 3R Heft 12/2010, p. 712-715.
- [2] Valve upgrading in combination with pipe network cleaning; Klein N., Hammann H.-G., Industriearmaturen Heft 1/2011, p. 53-56.

Authors:

Andreas Janning
 Stadtwerke Steinfurt GmbH
 Wiemelfeldstr. 48
 48565 Steinfurt
 Tel.: 02552 707-0
 Fax: 02552 707-517
 E-mail: andreas.janning@swst.de
 Internet: www.stadtwerke-steinfurt.de

Christian Schnell
 Hammann GmbH
 Zweibrücker Str. 13
 76855 Anweiler am Trifels
 Tel.: 06346 3004-28
 Fax: 06346 3004-56
 E-Mail: c.schnell@hammann-gmbh.de
 Internet: www.hammann-gmbh.de

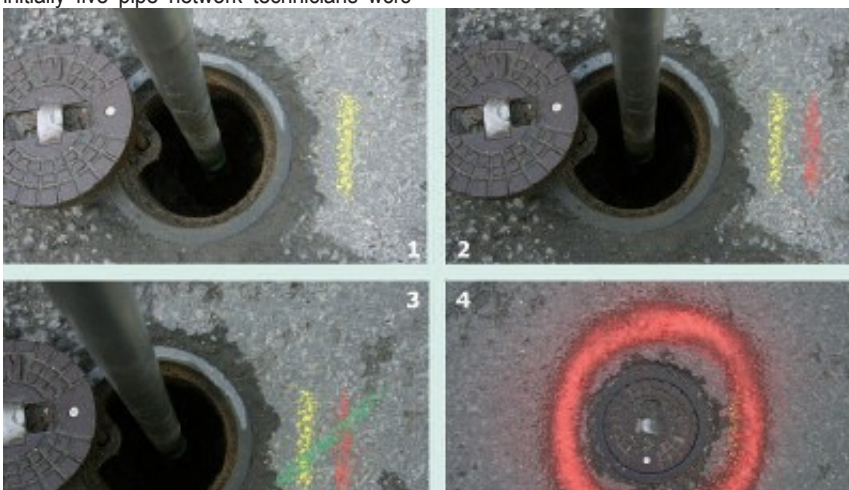


Fig. 3: Marking on road caps

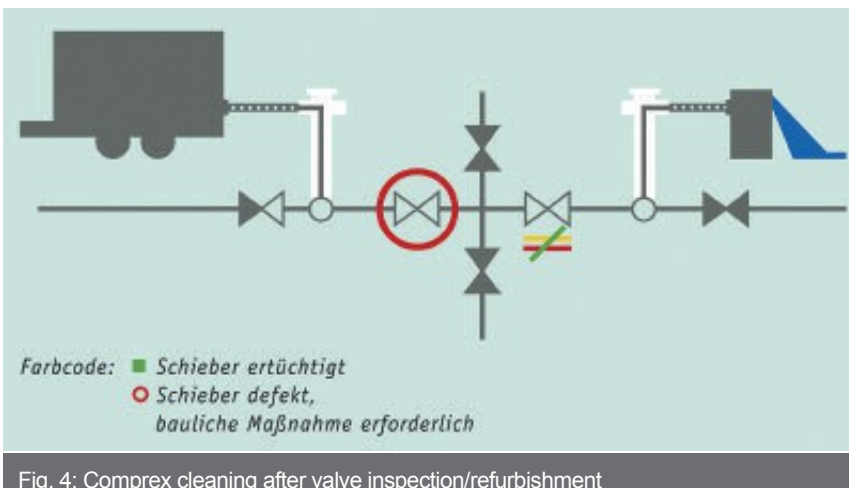


Fig. 4: Complex cleaning after valve inspection/refurbishment