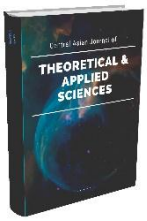


# CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

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# Repair of Water Networks


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***Abstract:*** *The main function of the distribution water supply network of urban water supply systems is the function of appropriate pressure transport of the required water.The inability of the water supply system to meet these requirements is seen as a serious shortcoming from its operation.*



***Key words:*** *fittings, transmission, temperature, corrosion, hydrant, hydraulic shocks, substances - inhibitors.*


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**Introduction:** This means that the maintenance of water supply networks and the water supply system in general includes a wide range of activities, including monitoring the operation and condition of the network and its equipment, troubleshooting, maintenance of fittings, flushing and cleaning of water pipes, connection of new sections of the network, thawing of frozen lines, maintenance of external water fittings, etc.

**Main body:** Special attention should be paid to the prevention of accidents.

The operation and monitoring of the network should be done by regularly circulating it and inspecting the wells with various fittings located in them. During inspections at least twice a year, the valves and fire hydrants are checked for serviceability, the bolts on the flange connections are tightened, and so on.

One of the most relevant examples in the technical operation of the network is to identify the causes of water leaks and eliminate them. Water leakage in the water supply network is caused by a number of reasons related to the lack of tightness of the joints of pipes and fittings, as well as defects in the form of cracks, separation of parts of individual sections of water pipes. Detection of water leaks is done using special sensitive devices, such as aquaphones, ground microphones, which are placed on the ground near the approximate leaks in the pipeline and move along the laying line according to the changes. The flow of water from the pipeline is determined by the maximum noise level by listening along the ground pipe laying path. In recent years, innovative developments in the field of pipe condition diagnostics have been aimed at increasing the efficiency of devices that detect water leakage and pipe wall thickness. Such devices include, for example, autonomous acoustic sensors - leak detectors, which are mounted directly on the pipe using a magnet.[1,2,3]

Based on the analysis of a number of parameters on the operator's console, equipped with remote signal transmission through special modules, the probability of leakage at one point or another in the pipeline is assessed.

Other innovative drinking water supply technologies allow you to see, hear and detect leaks in pipes, as well as identify unregistered connections and unaccounted pipe sections to their water supply system.

This technology is very effective in terms of finding leak points, as it allows to identify high-precision leakage points compared to other diagnostic methods, the error does not exceed 0.3 m along the road length. For a water supply system, the use of a tool capable of providing acoustic and video surveillance to search for potential problems in the pipeline network without interruption is a major achievement in itself, providing technical and economic efficiency and reducing water supply costs. Based on the results of inspections of networks and facilities, a repair plan is developed, which can be of two types: capital and current.

During the overhaul, obsolete structures, units and parts will be completely replaced, damage to the pipes during the current repair will be repaired, cleaning, lubrication, painting will be carried out.[4,5]

When using nets, it is important to clean them from mineral salts, rust and others. Solid sediments formed by corrosion of the inner walls of the pipes can be removed by means of cutting devices that are pulled through the pipes to the cables, as well as by washing the branches with an acid solution. In order to protect the walls of metal pipes from corrosion by acids, they are also added special substances - inhibitors.

The washing process consists of rinsing the pipeline section with water for 2-3 hours after filling it with an acid solution for 20-24 hours.

In case of freezing of metal pipes (mainly in separate closed parts of the network), they are thawed with hot water or electricity.

The hot water is transferred to the pipeline through a rubber sleeve. During electric heating, the pipe walls are heated and cause the ice to melt.

As an example, let’s look at the most common deficiencies identified during shutdown and control by water supply services, inspection of water fittings (fire hydrants).

Over time, failure of shut-off and control valves is observed as a result of difficult operating conditions, adverse effects of temperature and humidity, and partly due to poor quality of equipment. The most characteristic disadvantages of such fittings are:

- Fracture of the nut fastening part;
- Abrasion of rubber coatings;
- Filling of the inside of the valves with corrosion products;
- Corrosion of housing and bolts;
- Incomplete closing of valves, etc.

The technical condition of all fire hydrants operating in the water supply network is checked twice a year. Maintenance of hydrants includes:

- ✓ determine the performance and permeability (water flow) of the hydrant with the installation of a fire column;
- ✓ adjustment of the hatch and water cover;
- ✓ suitability of the hydrant housing;
- ✓ do not leak the valve;

- ✓ ease of opening and closing the valve;
- ✓ presence of water in the hydrant;
- ✓ compliance with the size and location of the fire hydrant.

Rich experience in the operation of hydrants has allowed us to identify: as a criterion for their failure:

- ➢ rotation of the rod in the coupling, rotation and crushing of the thread;
- ➢ incomplete opening of the drain hole when the valve is fully opened;
- ➢ damage to the valve ring;
- ➢ damage to nickel and bronze bushings in the valve body;
- ➢ breakage of valve guides in the hydrant housing;
- ➢ separation of the lower valve body.

Emergencies in pressurized water supply networks (especially large-diameter ones) can lead to significant material damage (flooding of tunnels, tunnels, etc.) and social movements (temporary interruption of water supply to the consumer, temporary stoppage of transport, etc.).[6,7]

In this regard, the timely detection and prompt elimination of accidents in the pipeline, including its fittings, is the responsibility of water management services.

Various events can cause the accident: violation of the tightness of the pipeline (mechanical damage, corrosion of individual pipes, cracking of pipes and fittings); hydraulic shocks (due to sudden stop of pumps during a power outage); temperature deformations.[8,9]

It should be noted that in urban conditions it is very difficult to quickly determine the location of the accident, as water can spread over a considerable distance under the asphalt.

Elimination of accidents in water supply networks is the responsibility of emergency repair teams of water supply services.

**Conclusion:** An emergency team connected to the dispatch service will go to the scene of the accident in special vehicles equipped with all the necessary items to quickly repair damaged pipes and fittings. Construction norms and regulations determine the timing of the termination of accidents in water supply networks depending on their diameter and depth of freezing.

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