

# Leszek Kałkowski

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## National stock of land properties : [abstract]

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Problemy Rozwoju Miast 5/1, 149

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Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

**Teresa Mądry**

## **PROBLEMS OF WATER PIPELINE AGEING**

### **Summary**

Presently, ca. 95% of population in Polish cities use municipal water supply systems. It is important that all consumers should receive water of good quality, in the required amounts and under proper pressure. All those requirements can be met, if water supply network is in a good technical condition, and that condition depends on the age of water pipeline, or time it was built in. The greatest number of water pipeline networks in Poland is that of twenty- and thirty-year old ones; however, there are also networks, which are fifty years old and older, even hundred years old. The measure of a water pipeline network life is its technical condition and the related failure frequency. Also various other factors, including the type of material that the pipes are made of, affect the life period of water pipeline networks. In the case of cast iron systems, the maximum life period is 75-80 years, while steel systems can be used for 50 years.

The notion of the water pipeline system life period is connected with the notion of its failure frequency. The failure frequency is measured with the so-called failure rate, which is calculated as the number of failures per 1 kilometre during a year [failure/km\*year]. The value of that rate, calculated for the Polish cities, amounts to 0.26-4.00.

Main reasons for water pipeline failures include age, operating conditions, quality of water, as well as quality of manufacture, especially of pipe joints, and type of materials they were made of.

Problems of water pipeline ageing in Poland and their influence on the operation of water pipeline systems have for years been a subject of scientific research. Also in the Institute of Urban Development a research project was accomplished to learn those problems. Questionnaire surveys were conducted in several water supply companies that operate water pipeline networks. Based on those surveys, it was found that the material structure of water supply networks aged 30 years plus (which, probably, may be susceptible to an increased failure frequency) was dominated by cast iron and steel. The survey data show that it is not always the age of the water pipeline network, which becomes the main factor of its failure. The basic failure factors include corrosion and damages to pipe joints. As far as materials are concerned, the highest failure rate is that of cast iron pipes, because of their leaking bell and spigot joints. The date of construction of a water pipeline network may be of significance, if that network was constructed in the 1960s-1980s.

In contrast to cast iron and steel pipelines, speaking of ageing of plastic water pipelines and their increased failure frequency will only be possible after at least 20-30 years.