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Robot torpedo to inspect water mains

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Spotting potential failure areas in water pipes is difficult without actually unearthing the pipe and carrying out visual inspection. But now researchers in Canada are looking at the possibility of using robots to inspect the condition of large diameter water pipes from the inside.

Researchers at the Canadian Institute for Research in Construction (IRC) are working on a two-year project with the Institute for Ocean Technology in St John's, Newfoundland, to adapt an autonomous underwater robotic vehicle (AUV) for use in inspecting in-service water mains.

There are approximately 65,000 kilometers of water mains feeding water distribution systems across North America. These pipes are the most sensitive and expensive components of water networks because they have no backup and cannot be taken out of service without cutting the water supply to the entire system. This makes inspection to assess their condition a difficult undertaking. However, with close to 50 per cent of these pipes already older than 60 years, the need for effective, non-disruptive inspection techniques is becoming more and more pressing because their failure could be catastrophic.

To come up with an effective solution, IRC researchers are testing the use of an AUV as a platform to carry cameras and non-destructive testing instruments into in-service pipes. They are also equipping the robot with an on-board data-acquisition system that can store or transmit data from the robot to an operator in real time. Although the torpedo-shaped robots were designed for use in open water, the researchers are modifying them to function in large pipes with flowing water. This will allow them to make an instant assessment of the quality of the pipe and is a major boost to current technology, which only allows the internal inspection of drained pipes.

Dr Homayoun Najjaran, who leads the team, believes the work will put Canadian pipe inspection companies among the world's elite for this type of work and will benefit all water utility companies.

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