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WATER DISTRIBUTION MAIN LINING AND SERVICE CONNECTION REINSTATEMENT

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ABSTRACT: According to the American Society of Civil Engineers, approximately 6 billion gallons of clean, treated drinking water are lost each day in the United States due to pipe deterioration. Additionally, much of the nation's drinking water pipe infrastructure is long past its design life and in need of repair. Complete replacement of these pipes using conventional dig solutions can be time consuming and very disruptive to traffic, citizens and the environment. These problems can easily be avoided by the use of trenchless pressure pipe lining technologies.

Several municipalities have utilized one such technology, a polyester reinforced polyethylene lining system, for rehabilitation of small diameter distribution piping. Although the lining technology is not new to the USA and has nearly 1 million feet of experience worldwide, the process has heretofore been used in moderation due to the fact that excavations were required at each service connection. However, recent technology developments have allowed for the robotic internal sealing and reinstatement of the service connections, thereby eliminating the unnecessary disruption and added costs of excavations.

This paper will provide specifics of these projects, including details of the lining technology utilized. Most notably, the paper will explore details of the robotic technology used for the internal sealing and reinstatement of the service connections. By way of a remote operator above ground, the unique process takes place inside the pipe, utilizing robotics, eddy current sensor technology, and specially designed milling bits to install a mechanical seal at each service connection.