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Underwater Robot for Inspection of In-service Transmission Mains

Objective

To develop an autonomous underwater vehicle (AUV) as a platform to carry visual-imaging and non-destructive testing (NDT) instruments into in-service pipes.

Background

Large-diameter water pipes must be inspected periodically to gain information about their current condition and rate of deterioration. Conventional inspection methods require taking the pipes out of service to drain and clean them. However, because water transmission mains rarely have enough redundancy to compensate for even a short de-commissioning, non-disruptive inspection techniques are required.

Statement of Work

In this project we will:

- Adapt an existing modular AUV so that it can enter and navigate large water pipes non-disruptively;
- Add to the robot non-destructive sensors, visual imaging instruments, and onboard data acquisition systems;
- Develop the associated software.

Expected Outcomes

- The availability of such technology is expected to increase the frequency with which water utilities test their large water transmission mains. This will result in better risk management – saving costs while reducing the probability of pipe failure.
- The robot will serve as a testing platform for future sensor technologies developed at NRC or by third parties.
- This development will be a step forward from existing robotic inspection technology, which only works in completely drained pipes.

Partners

The NRC Institute for Ocean Technology (IOT), the NRC Centre for Sustainable Infrastructure Research (CSIR), and the University of Regina.

Start/Expected Completion Dates

This project began in March 2005 and will be completed in mid 2007.

Project manager

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For more information, see http://irc.nrc-cnrc.gc.ca/ui/bu/underwater_e.html

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NRC's modular autonomous underwater vehicle (AUV)



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