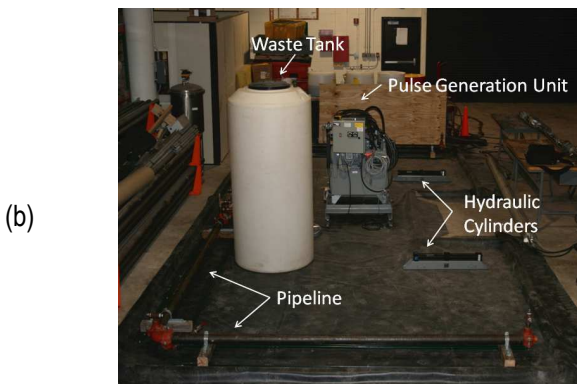
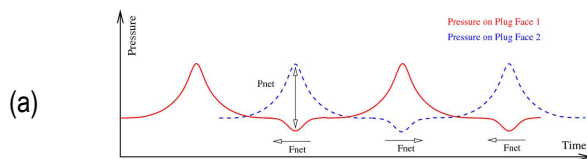


PROJECT FACT SHEET

# Design and Development of Innovative High-Level Waste Pipeline Unplugging Technologies

FIU's Applied Research Center is assisting the Department of Energy objectives by developing novel pipeline unplugging technologies.

Availability of pipeline unplugging technologies is critical to the effort of cross-site HLW transfers through pipelines. In the past, some of the pipelines have plugged resulting in schedule delays and increased costs. Furthermore, pipeline plugging has been cited as one of the major issues that can result in unplanned outages at the Hanford WTP, causing inconsistent operation. Currently, there are no unplugging technologies qualified to be deployed at the sites should the plugging of a transfer line occur. In the past, a number of plug locating, and pipe unplugging technologies were demonstrated at FIU, which allowed down-selection of the most promising technologies that have potential for deployment. FIU has evaluated the lessons learned from the previous technology testing and has directed current efforts to developing new pipeline unplugging devices and methods that can assist site engineers when a plugging event occurs.



Asynchronous pulsing method: (a) principles of operation  
(b) bench-scale testbed for asynchronous pulsing



Peristaltic crawler: (a) first generation unit (b) second generation unit

## Project Objectives

The overall objective of this task is to develop alternative pipeline unplugging techniques that meet DoE site requirements. Two approaches being developed include an asynchronous pulsing method and a peristaltic crawler. These systems will be optimally designed and evaluated to determine their effectiveness for operability and deployability.

## Project Benefits

Benefits of developing novel pipeline unplugging methodologies include:

- Placing new technologies for pipeline unplugging into the Hanford and Savannah River Sites "toolbox"
- Ensuring smooth operation of waste transfers and assisting tank farm engineers with meeting milestones

## Project Accomplishments

- Development of conceptual designs for two novel pipeline unplugging methods.
- Designed pulse generation hydraulic unit for the asynchronous pulsing system.
- Developed controller and commissioned asynchronous pulsing system.
- Designed, developed and tested a first generation peristaltic crawler.
- Developed a second generation peristaltic crawler using stronger, more durable materials. Designed and manufactured an automated motion controller for the crawler.