



Installing a pipe with leak ports in the leak simulator



Installing VOC flux chambers on the soil surface in the leak simulator

AIRBORNE LEAK DETECTION TECHNOLOGIES EVALUATION JOINT INDUSTRY PROJECT

The Joint Industry Project was launched in December 2014 to evaluate the effectiveness of pipeline leak detection technologies conveyed on airborne platforms to detect subsurface releases of liquid hydrocarbons. This project will include a variety of activities including modelling, lab and field testing. Vendors participating in these tests obtain key information to develop products more successful at detecting liquid hydrocarbon releases.

The results of this project will assist pipeline operating companies to identify the best technologies for detecting liquid hydrocarbon releases from airborne platforms and will provide key information to the equipment vendors to assist them in enhancing the sensitivity and reliability of their equipment.

BACKGROUND

Initially, C-FER Technologies began work with Enbridge Pipelines Inc. in assessing the state-of-the-art leak detection systems based on airborne platforms in early 2013. A technology review was undertaken to identify commercial technologies that have the potential to detect small leaks of liquid hydrocarbons from underground pipelines. Vendors of these technologies were invited to participate in the project by providing technical information on the performance of their respective technology.

The first phase of work included modelling the subsurface transport of the released fluid through the soil, as well as the dispersion of the volatile organic compounds (VOCs) into the atmosphere. The potential to use thermal imaging to locate small liquid leaks was also evaluated with similar models.

In addition, the first phase of work included the development of functional requirements and a conceptual design of a field testing setup where controlled subsurface releases could be created and observed by airborne leak detection systems.

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WORK SCOPE

The objective of the project is to conduct full-scale field trials of the most promising airborne leak detection systems. Based on the previous evaluations, three phases of work have been identified to select the most promising technologies and design rigorous field trials.

1. Determine the VOC flux at the ground surface in sub-surface liquid releases conducted in C-FER's large-scale leak simulator (otherwise known as the ELDER apparatus). Use these test results to calibrate release models developed in the first phase of the study which predict the dispersion of hydrocarbons in the atmosphere to determine which technologies can potentially detect these leaks.
2. Verify the sensitivity of commercial technologies for detecting VOCs in the atmosphere by creating known releases under controlled conditions either in large-scale lab or field tests.
3. Evaluate the performance of technologies in full field trials where promising technologies are installed on airborne platforms and flown over multiple, independently controlled, Field Leak Simulators to create situations where the specific release location is unknown to the equipment vendor.

The current phase of the Joint Industry Project will include the first two of these initiatives, which focus on testing and modelling. The remaining field scale testing programs would be pursued as subsequent phases of work provided that the preliminary tests demonstrate promising performance from at least one technology.

PROJECT FUNDING

The Joint Industry Project was initiated in December 2014 with three pipeline operating companies. Other companies that operate liquids pipelines can join the project for a fee of CAD \$200,000. New participants will receive all past work on the project and will become part of the Project Steering Committee which oversees the project work and determines the direction and scope of all project activities.

The project is also supported by a grant from Western Economic Diversification that is targeted at developing the unique laboratory and field testing systems required to assess airborne leak detection technologies. This grant matches a portion of the industry contribution towards equipment, materials and contractors used to execute the project.

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