News Release

February 13, 2019
NTT Advanced Technology Corporation
Picarro, Inc.

Picarro and NTT-AT Deploy Natural Gas Pipeline Inspection Solution for Teiseki Pipeline Corporation in Japan

～ Domestic Deployment of Natural Gas Pipeline Inspection Service by Using Vehicle-based Methane Concentration Measurement System and Analytics ～

NTT Advanced Technology Corporation ("NTT-AT", Headquarters: Kawasaki City, Kanagawa Prefecture, President: George Kimura) announced today that NTT-AT will start domestic deployment of Picarro's vehicle-based natural gas pipeline inspection solution developed by Picarro, Inc. ("Picarro" Headquarters: Santa Clara, California, USA, President: Alex Balkanski)..

This solution and service enables natural gas operators to conduct pipeline inspection more efficiently compared with the conventional, foot-based pipeline inspection method. The system uses a high-sensitivity methane sensor mounted to a vehicle which drives near the pipeline. The data is then uploaded to Picarro's cloud and processed by Picarro's analytics. This system has been customized by NTT-AT to be compliant for use under Japanese regulations in Japan, and Teiseki Pipeline Corporation commenced operations on November 1, 2018.

■Background

.Natural gas pipelines are regularly inspected by a field operator walking over the pipeline,

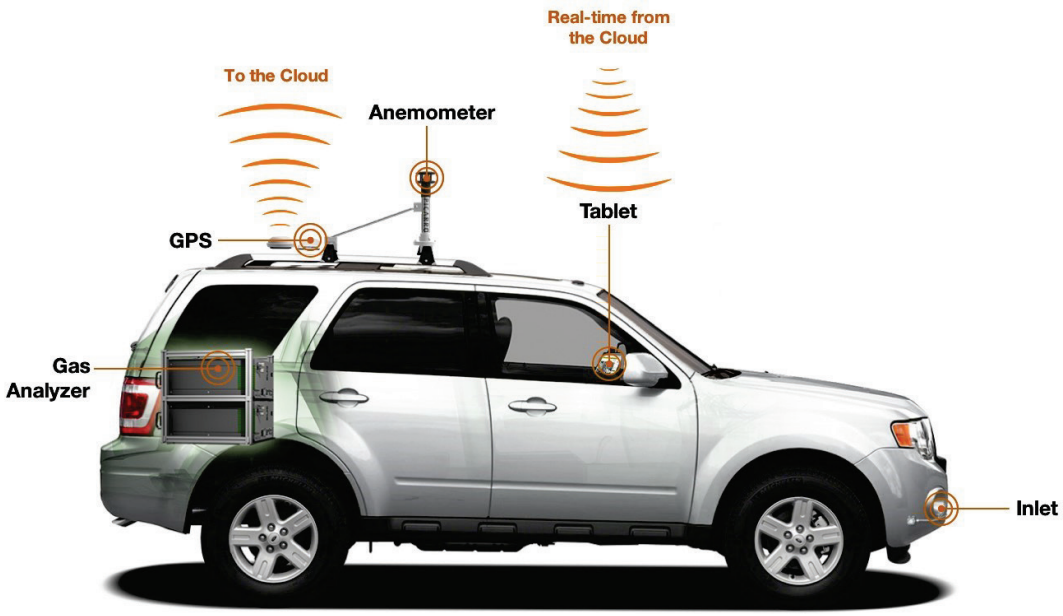

Figure.1 Surveyor Hardware Configuration

carrying a handheld methane gas sensor. By installing their highly sensitive sensors in vehicles, Picarro offers a solution that enables inspection of pipelines much more efficiently and with higher sensitivity than current regulatory pipeline inspection methods. Picarro's mobile hardware and software solution is approved for regulatory natural gas leak survey in six U.S. states, Canada, Italy, Switzerland, Australia, China and now used in Japan, and its use has been expanding each year.

NTT-AT optimized Picarro's solution comprised of a vehicle-based methane gas measurement sensor [SurveyorTM*] (Figure.1) and cloud-based software and analytics platform [P-CubedTM*] in accordance with the Japanese traffic and radio laws. Teiseki Pipeline Corporation has deployed this service as an auxiliary survey that compliments the currently regulated surveys. They began these surveys in November 2018.

■Service Overview

(1) Inspection Mechanism and Features

This system measures the gas concentration in the air by sampling air from inlets on the front of the vehicle and analyzing this continuously flowing air sample with a sensitive methane sensor mounted in the rear of the vehicle. The sensor, based on optical cavity ring-down spectroscopy, has parts-per billion sensitivity to methane and ethane and can be used at highway speeds to detect natural gas. Owing to its high sensitivity, this gas detection method is much more effective and sensitive than current regulatory pipeline survey methods. Also, it is possible to carry out the vehicle-based inspection even in a rain or snow.

(2) Measured Data

Methane concentration measurements – along with the vehicle's precise location and measurements of wind speed and direction from the vehicle-mounted GPS and anemometer – are transmitted in real time to Picarro's cloud-based reporting platform. The methane plume data is then processed by Picarro's analytics which produces a map of areas that likely contain gas leaks. These indicated areas are displayed to operators so the leak can be pinpointed and addressed in real time. Since the system also measures ethane, the analytics can predict the likelihood of the methane originating from a gas leak versus methane from sewers or other sources. (Figure. 2).

■Benefits of this Service

The following benefits can be expected using this service: (1) Safety of the pipeline can be more secure by conducting the inspection in short time and high sensitivity. (2) This solution can detect early-stage deterioration of the pipeline so it is easy to plan long-term repairs. (3) Inspection can be carried out faster and more efficiently than with existing methods so it will contribute to more rapid recovery of the gas transmission and distribution networks after natural disasters.

■Next Deployment

NTT-AT and Picarro will contribute to the realization of a safe and secure smart city for other natural gas companies and gas pipeline business owners in Japan by promoting this pipeline management solution.

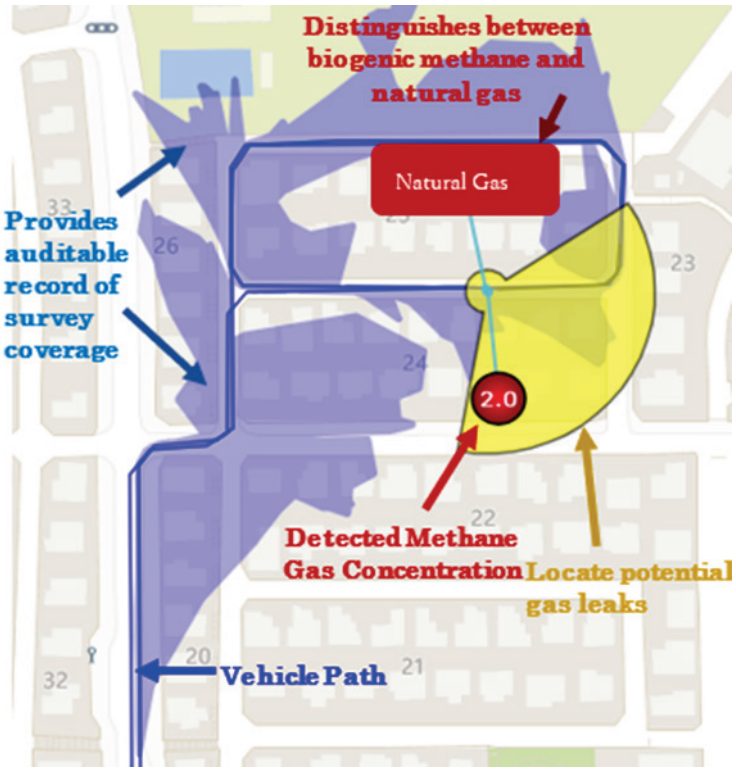

Figure 2 Example of Inspection Results Displayed in P-Cubed

NTT Advanced Technology Corporation Company Profile

https://www.ntt-at.com/

NTT Advanced Technology Corporation has been one of the technology companies in the NTT Group since 1979 and aims to be a “value partner” to our customers by providing innovative proposals and derived solutions with the integration of the cutting edge R&D technologies of NTT Laboratories: network, media processing, Japanese language processing, environmental, optical-and nano-devices, as well as worldwide state-of the art technologies in a variety of fields.

Picarro, Inc Company Profile

https://www.picarro.com

Picarro is a leading provider of solutions to measure greenhouse gas (GHG) concentrations, trace gases and stable isotopes across many scientific applications and industrial markets. Picarro is the industry leader in analytics-driven leak detection and quantification solutions, enabling our energy customers to increase capital efficiency while simultaneously improving the safety of their infrastructure.

*SurveyorTM and P-CubedTM are registered trademark of Picarro Inc.

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