

News Release

FOR IMMEDIATE RELEASE

Implementation of Field Tests of a Manhole Crime Prevention and Safety Measure Solution in Niigata City Using "LPWA" Wireless Communications Technology

Wireless Communications Ranging Over one Kilometer as the First Step Toward Practical Service Implementation

Tokyo, March 16, 2017 --- Hitachi Systems, Ltd. ("Hitachi Systems"), a wholly owned subsidiary of Hitachi, Ltd. (TSE: 6501), today announced that, in conjunction with TOMISU Corp. ("TOMISU") and eTRUST Co., Ltd. ("eTRUST"), it performed field tests on a manhole crime prevention safety measure with the cooperation of the Niigata City Waterworks Bureau and Niigata City. As a result of these tests, Hitachi Systems verified the viability of wireless communications over a stretch of over one kilometer using "LPWA (Low Power, Wide Area)" wireless communications technology.



Receiver installed on the roof of the Akiha Ward Office



Installing a transmitter in a manhole



This initiative was part of a wider set of demonstrative field tests that began in May 2016 by Hitachi Systems, TOMISU and eTRUST. This solution is intended to provide comprehensive support for manhole crime prevention and safety measures using sensors and IoT technology to monitor manholes for the presence of dangerous substances, and to detect whether the manhole cover is open or shut, the emission of noxious fumes, and water quality and levels, in addition to providing other information intended to prevent worker accidents during equipment inspections. While initial field

tests used a specified low power radio setup, this limited transmission distances when manhole covers were shut. During field tests LPWA, a wireless communications technology capable of transmitting over long distances with a low power draw, arose as an alternative technological solution that could potentially resolve this issue.

This test involved installing a receiver on the roof of the Akiha Ward Office in Niigata City and transmitters in water manholes under the control of the Niigata City Waterworks Bureau to verify that LPWA-based transmissions were possible amidst real-life obstacles found in the urban area of Niigata City. This test verified that wireless communications could be monitored from a manhole located over one kilometer away from the receiver site. This test also demonstrated that, in addition to providing a greater transmission range compared to the specified low power radio setup tested, the shift to LPWA would also curtail installation and operating costs, paving the way to the practical implementation of this service further down the road.

Looking ahead, Hitachi Systems and its partners will look to establishing the earliest possible application of this manhole crime prevention and safety measure solution, in addition to coordinating on further field tests on the remote monitoring of water leakage, flow levels, water quality and other factors in an aim to further contribute to safety measures and facility maintenance for water supply works as a whole.

Summary of LPWA communications tests

Item	Details
Implementation date	December 2016 to January 2017
Implementation location	Niigata City, Niigata
Installation of receiver	Roof of Akiha Ward Office, Niigata City
Installation of transmitters	Water manholes near Akiha Ward Office, Niigata City
Details of test performed	Measuring the transmission range of LPWA communications

Role of each company in this field test

Company name	Role
Hitachi Systems	Project supervision
TOMISU	Manhole transmitter installation work
eTRUST	Provision of LPWA communications equipment, wireless communications measuring work
Niigata City Waterworks Bureau and Niigata City	Provision of the testing field

* Company names and product names included in this information are the trademarks and registered trademarks of each company.

About Hitachi Systems, Ltd.

Hitachi Systems, Ltd. is an IT services company with strengths in high-quality operations and maintenance services. Hitachi Systems works closely with customers through a network of roughly 300 service sites and contact centers across Japan, through which it offers a wide range of business system design and integration services, as well as outsourcing services that take advantage of its robust data center infrastructure. A leader since the dawn of the IT era in Japan, Hitachi Systems leverages its track record and proficiency in IT services to offer one-stop services covering the entire IT life cycle - from system consulting to integration, installation, operation and maintenance. Hitachi Systems also pushes beyond the boundaries of IT to create new value for customers, with the aim of becoming a global service company to which customers can entrust any operation.

For details: <http://www.hitachi-systems.com/eng/>

About TOMISU

Since its founding in 1937, TOMISU Corp. has continued to produce a wide range of water and sewage products aimed at enriching the lives of the local populace. TOMISU has a long history of developing delivering products in-house, ranging from iron covers for fire hydrants, air valves and gate valves, and delivering them to various municipalities all over Japan. In an age where client needs are diversifying, TOMISU has developed a reputation for reducing construction time and expenses while delivering outstanding levels of product safety, quality and eco-friendliness in addition to retaining the long-lasting properties of its products. TOMISU is committed to maintaining its reputation as a provider of products in which the company is proud, backed by a strict control system, to further contribute to maintaining safe and reliable infrastructure, while also actively pursuing the enhancement and creation of new technologies and valuing customer feedback.

For details: <http://www.tomisu.info/>

About eTRUST

In the 80 years since its founding, eTRUST Co., Ltd. has been involved in a broad range of infrastructure development projects for the Ministry of Land, Infrastructure, Transport and Tourism and prefectural and city municipalities, among others. Backed by a strong technological and organizational foundation, eTRUST is capable of undertaking any endeavor in the electrical and information communications fields through a systematic approach to design through to construction and maintenance. In recent times, the company has successfully developed new "disaster prevention and environmental surveillance systems" based on its technical know-how and experience

in the electrical and information communications fields. In addition to its excellent track record delivering systems to municipalities in Japan, eTRUST also provides "disaster prevention monitoring systems" to countries in the Asian region that are highly susceptible to natural disasters. This system is capable of transmitting emergency evacuation information based on information collected from image data. eTRUST will continue to contribute to urban development facilitating local communities living with peace of mind based on the catch phrase "approaching the natural environment with IoT".

For details: <http://etrust.ne.jp/corporate/>

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