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Research

Benefiting technology to detect pipe leakage in 1 minute

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PEKAN, 12 November 2020 - The problem of pipe leakage, water pilferage, and the like during water distribution to consumers frequently occur.

There is also leakage in the transmission system due to natural disasters and ageing pipeline that result in instability of water supply to the water tanks.

These problems will cause an enormous loss to the country. Not only the loss of treated water, but it

affects the water industry because the revenue cannot be collected and at the same time it increases the non-revenue water (NRW) which indicates the high water losses.

These issues had prompted a lecturer from the Faculty of Mechanical and Automotive Engineering Technology (FTKMA), Universiti Malaysia Pahang (UMP), Associate Professor Ir. Dr. Mohd Fairusham Ghazali to invent Leak Locator Rig to Real (LLRR) to detect problems of underground pipe leakage that only takes a minute.

“With this mobile system, we can analyse the areas of pipe leakage without the need to go to the laboratory to perform the test, and it is easy to use even for the less skilled operators compared to the existing method that requires skilled operators.

“In line with the digital development and industrial revolution 4.0, we are trying to improve the system through the internet of things (IoT) and wireless technology.

“At the same time, this systems can be controlled using telephone and can be accessed from anywhere,” he said.

The research, which began in 2014, initially executed in computer simulation before testing in the laboratory.

“The system used is based on the mechanism of water pressure in the piping system.

“The water pressure signal obtained through sensors placed on fire hydrants is analysed using methods developed by UMP to identify the location of the water leakages.

“We are grateful to the management of the university and Pengurusan Air Pahang Berhad (PAIP), which always help the development of this research,” he said.

Among the assistance provided is to conduct tests on the water piping system for identifying locations that have high percentages of leakage.

This collaboration allows the UMP research team to conduct trial runs on the piping system in Indera Mahkota and shares information on the tools used during the operation.

He added that the NRW loss rate in Malaysia is around 36 per cent and the government targets to reduce the NRW rate by 2025.

“High NRW will have a major impact on the economy, especially in maintenance.

“It also affects the environment because the water quality will be affected in the event of a leak.

“There are such products in the market, but most of them are imported and expensive, and the maintenance cost is high,” he said.

Meanwhile, according to a lecturer from the Faculty of Electrical & Electronic Engineering Technology (FTKEE), Mohd Falfazli Mat Jusoh, when the operators want to test a designated area, they only need to open the system and press a button to process the information.

“This system will be carried out following certain procedures, and results will be obtained

immediately.

“This research is also expected to help the industry partners in reducing water leakage rate as targeted by the Malaysian government with low cost,” he said.

This project was assisted by FTKMA students, Mohd Fadhlan Mohd Yusof, Muhammad Aminuddin Pi Remli, Muhammad Hanafi Yusof and Wan Mohd Nafis Wan Lazaini.

This research bagged a gold medal and special award in the British Invention Show (BIS) 2018, International Invention, Innovation & Technology Exposition (ITEX) 2018 and Creation, Innovation, Technology and Research Exposition (CITREX) 2018.

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