

SUCCESS STORY

# WIRELESS MONITORING OF CONCRETE DAM SAFETY IN ASIA

---

REGION:

Asia

---

SECTOR:

Structural Health Monitoring

---

PROJECT TYPE:

Dam Monitoring

---

MAIN PRODUCT:

**Loadsensing** | The Wireless Monitoring System

## Challenge

The Assyakirin Dam is located in Sarawak, Malaysia, a region whose economy has expanded to oil palm, forest plantations and agriculture, among other things. It collects rainwater during the monsoon season and releases it when the water level in the river is not sufficient to supply raw water to the water treatment plants and agricultural areas. The dam had a monitoring system in the past but it was vandalized and this triggered the need to update and automate the monitoring of the reservoir level and slope stability of the saddle dam.

Meanwhile, the Shihmen Dam forms the Shihmen Reservoir, Taiwan's third largest artificial lake which provides irrigation, flood control, hydroelectricity and domestic water supply for more than three million people in northern Taiwan. The dam needed to automate the piezometer monitoring around the dam to have real-time data on the pore water pressure of the soil surrounding the dam structure.

## Solution

Together with Worldsensing's partner Soil Instruments Malaysia, robust Loadsensing vibrating wire data nodes monitor piezometers on the Assyakirin saddle dam while other nodes are connected to ultrasonic water level sensors on the dam wall.

In conjunction with Sanlien Technology Corp., Loadsensing data nodes are connected to piezometers installed to piezometers spread around the Shihmen dam structure.

Loadsensing uses LoRa: a long-range, low-power wireless technology used by IoT networks worldwide. The system's low-power components remain on sleep mode and are only activated at predetermined times thus extending the lifespan of the batteries for up to 8 years.

Loadsensing, the wireless monitoring system, was installed on several dams in Malaysia and Taiwan to monitor not only the stability of the concrete dam structure but also the pore water pressure and other parameters in the surrounding areas. This ensures the structural integrity of the dam and soil conditions especially during the monsoon season when heavy rains can raise the water levels of the reservoir and increase the risk of dam structure failures.

---

## ADVANTAGES

- Real-time, wireless monitoring of sensors installed within the dam structure, around the walls and surrounding areas
- Real-time pore water pressure monitoring
- Compatibility with various types of sensors (piezometers, ultrasonic water level sensors etc.)
- Minimal maintenance required for the low-power wireless data nodes
- Strong radio signals in spite of being covered to protect from potential vandalism
- Robust design which allows the data nodes to be installed in harsh environments

# Benefits

Real-time, wireless monitoring of the dams enables proper management of the water level in the reservoirs which in turn minimizes the risks of flooding, ensures safety of the citizens, supports agriculture and protects the livelihood in the surrounding areas. The wireless data nodes also significantly reduces the costs for monitoring and their robust design and strong radio signal allow for the data nodes to be covered and protected from vandalism and harsh weather elements.



*Figure 1: Loadsensing vibrating wire nodes*



*Figure 2: Shihmen Dam in Taiwan*



Find out more:  
[www.worldsensing.com](http://www.worldsensing.com)

Get in touch:  
[sales@worldsensing.com](mailto:sales@worldsensing.com)