

Support for Digital Transformation of LNG Facility Management

by Introduction of Japanese Advanced Inspection Technologies

# **IoT corrosion sensor**

## **—Wireless CUI and atmospheric corrosion monitoring—**

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# Managing CUI in Japan

## Reduce the time and cost required for CUI inspection.

As Is:

- The locations where CUI occurs are unclear.
- Remove the insulation every few years to inspect for CUI
- No significant CUI is found in most areas.
- Sometimes, unexpected CUI occurs

Improved:

- Execution of RBM<sup>\*1</sup>(Risk Based Maintenance)

\*1 Risk= Probability of failure x Consequence of failure

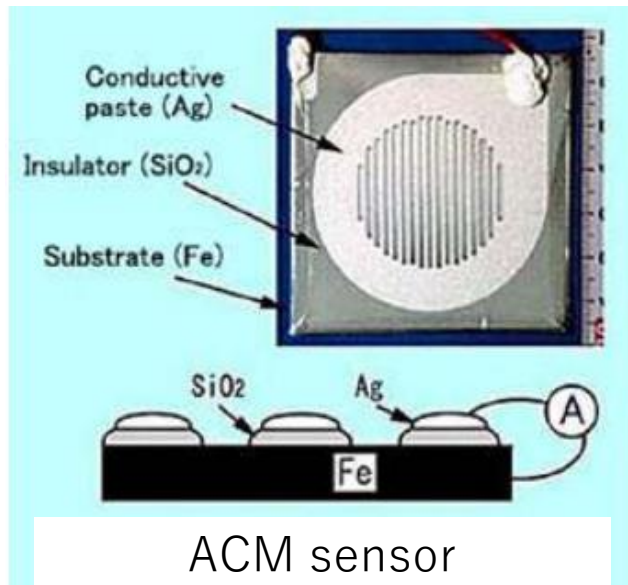
- Monitoring the corrosion rate by IoT corrosion sensor
- Exclude areas with a low risk of CUI from inspection
- Maintenance resources can be focused on areas at risk of CUI



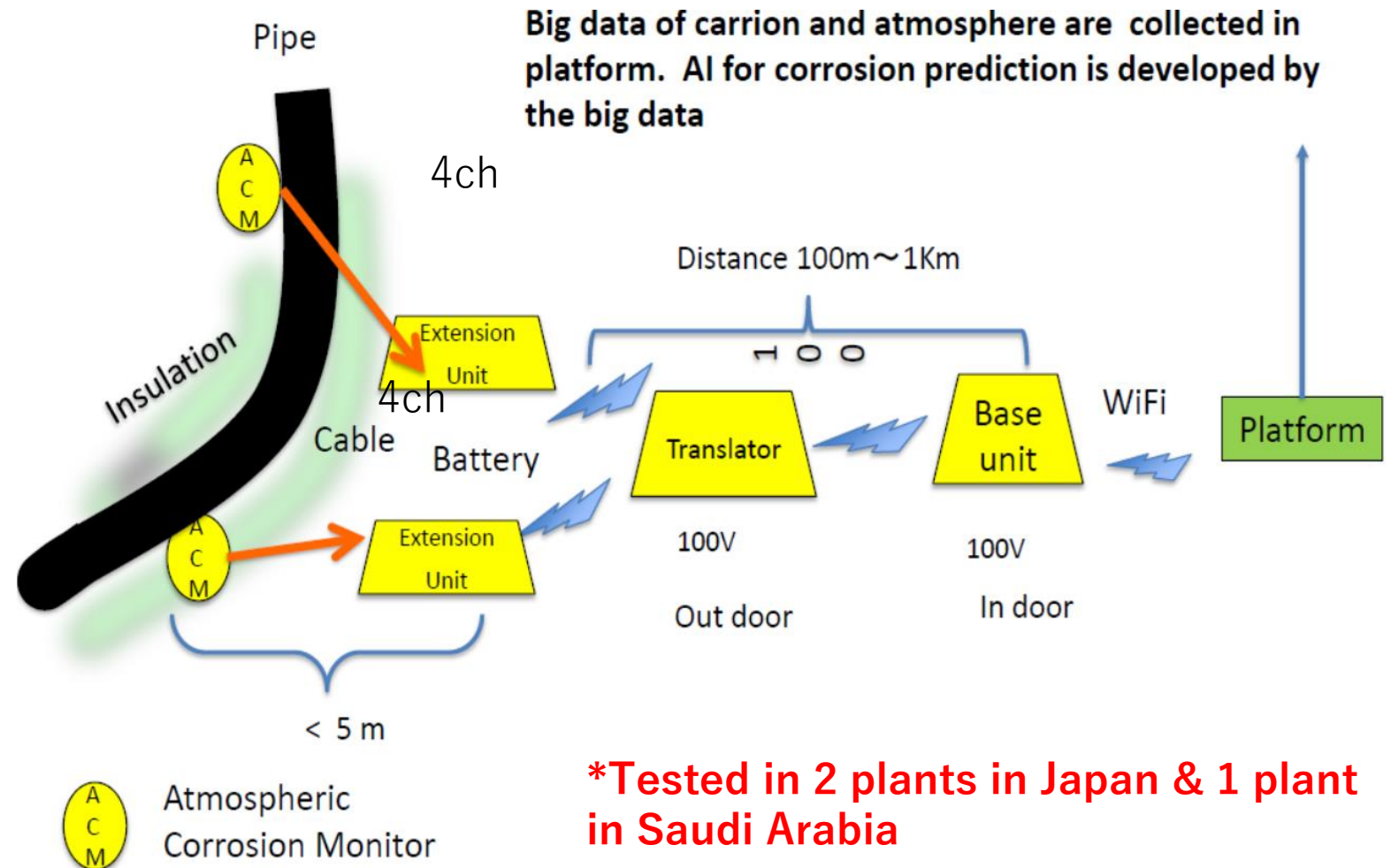
**Reduce CUI accident, and inspection time and cost**

# Concept of IoT corrosion sensor

Corroion current & temperature are measured.  
Wireless data transmission.



ACM sensor  
Measuring corrosion  
current between Fe and  
Ag



# Advantages of Our IoT Corrosion Monitoring System

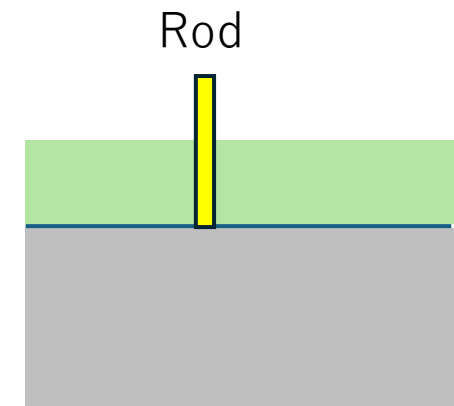
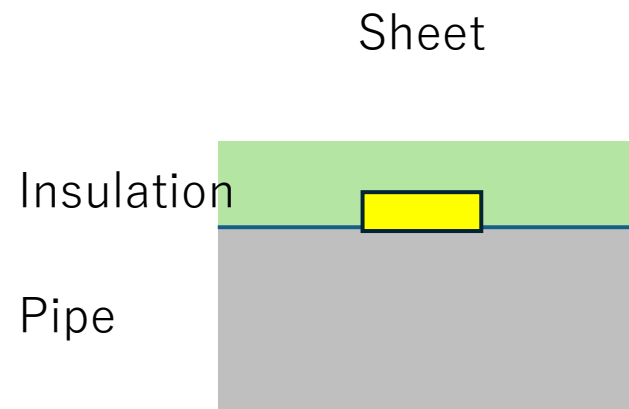
- Compact size transmission system (91mm x 55mm)
- No external power supply required
- Long-term monitoring (1 year (60-minute measurement interval))
- Low cost
- Customizable sensor design
- Optional integration of temperature, humidity, and rainfall sensors

**Child IoT device**



91 mm × 55 mm

**Sensor design example**



No insulation removal required for installation.

# Feature possible concept

## Possible factors governing probability of CUI which have been clarified by previous study

- ✓ Metal temp
- ✓ Size & Thickness, Area and Complexity of Structure
- ✓ Water in insulation
- ✓ Temp, rainfall

## Development improving prediction probability

### ● Field Data by IoT corrosion sensor

- ✓ Corrosion
- ✓ Temperature



As-is

### ● Water measurement by Neutron moisture meter by Inspection

### ● Environments Data from Artificial Satellite



Expert Supports

- *AI analysis* between Corrosion & Environments



**Thailand-specific field data is essential to develop a CUI prediction model customized for PTT LNG.**

## Final target

**Predict CUI-prone locations without removing insulation from mainly environmental data**