



# Radiation Leak Detection

LoRa® APPLICATION BRIEF

## DESCRIPTION

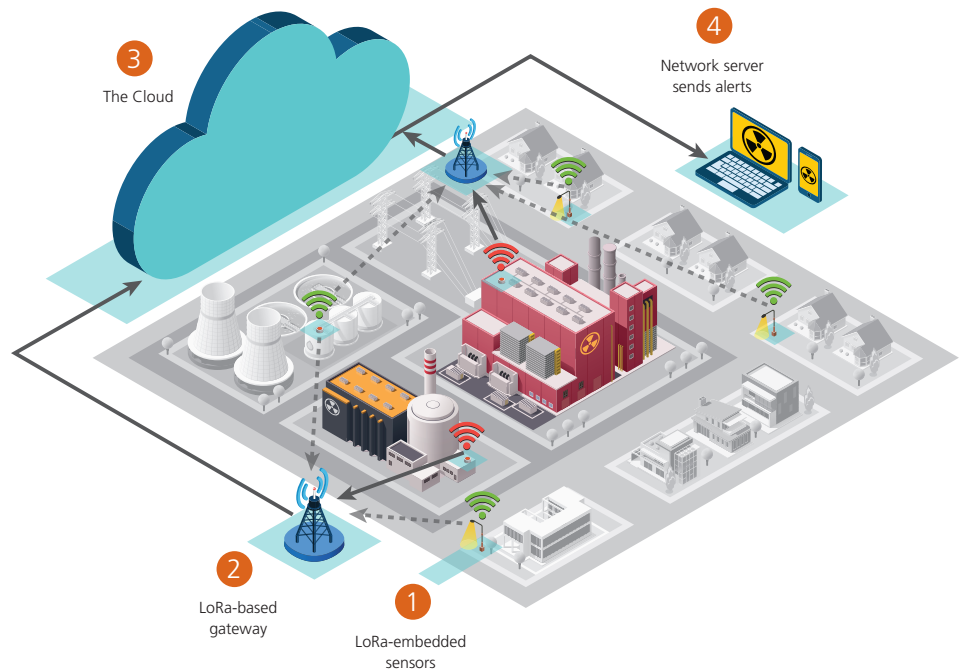
Nuclear power plants produce about 20 percent\* of the nation's power and nearly three million Americans live within 10 miles of an operating nuclear power plant. These nuclear power plants pose a potential danger to those working in and/or living around the area, as radioactive materials can leak causing illness. Because radiation cannot be detected through human senses, communities must implement radiation leak detection sensors throughout the nuclear power plant and the community. The constant measure of radiation can ensure a safe environment for residents and employees.

By implementing a radiation leak detection solution comprised of sensors and gateways embedded with LoRa Technology, and a low power wide area network based on the LoRaWAN™ protocol, communities with nuclear power plants can measure radiation levels and detect leaks to ensure the safety of its employees and those living in surrounding areas.

## HOW A LORAWAN-BASED RADIATION LEAK DETECTION SYSTEM WORKS

Semtech LoRa Technology enables connectivity, real-time analytics, reporting, and additional functions such as geolocation.

- 1 Radiation level data is collected by sensors embedded with LoRa Technology
- 2 Data from sensor is periodically sent to a LoRa gateway
- 3 Gateway sends information to network server where the data is analyzed by an application server
- 4 Application server sends alerts to facility managers via mobile device or computer



Semtech products used in this application:

Sensors	Gateway
• SX1272/3	• SX1301
• SX1276/7/8/9	

All application elements (sensing modules, gateways, servers, software) are available through LoRa Alliance™ partners.

\*Source: <https://www.ready.gov/nuclear-power-plants>

## BENEFITS

- Consistently measure radiation levels at nuclear power plant and in surrounding communities to ensure levels remain safe.
- Low maintenance costs thanks to LoRa sensors low power operation, ensuring batteries can last 10 years.
- Provides reliable RF communication link between sensing infrastructure and LoRaWAN-based network.

## APPLICATIONS

Sensors placed throughout a nuclear power plant site and in community street lights can consistently measure radiation levels throughout to ensure the safety of power plant employees and community residents.



## FIND YOUR IoT SOLUTION FROM SEMTECH'S LoRa ECOSYSTEM

MODULES & MODEMS

SENSORS

BASE STATIONS

NETWORK SERVERS

SYSTEM INTEGRATORS

For a full list of LoRa Ecosystem partners and services, visit our LoRa Community [www.semtech.com/LoRaCommunity](http://www.semtech.com/LoRaCommunity)

## KEY FEATURES OF SEMTECH'S LoRa WIRELESS RF TECHNOLOGY

**LONG RANGE** Penetrates in dense urban and deep indoor environments, connecting to sensors 15-30 miles away in rural areas

**LOW POWER** Enables multi-year battery lifetime of up to 20 years or more

**HIGH CAPACITY** Supports millions of messages per base station

**GEOLOCATION** Enables tracking applications without GPS or additional power consumption

**STANDARDIZED** LoRaWAN specification ensures interoperability among applications, IoT solution providers and telecom operators

**SECURE** Embedded end-to-end AES-128 encryption of data ensuring optimal privacy and protection

**LOW COST** Reduces upfront infrastructure investments, as well as operating and end-node costs

## JUMP-START YOUR IoT DEVELOPMENT TODAY

Semtech offers several training options to help you get started:



Learn about Semtech's LoRa Technology platform: visit [www.semtech.com/IoT](http://www.semtech.com/IoT)



Join the LoRa Community: [www.semtech.com/LoRaCommunity](http://www.semtech.com/LoRaCommunity)



Become a member of the LoRa Alliance™: visit [www.lora-alliance.org](http://www.lora-alliance.org)



Attend a LoRa Boot Camp for a full-day of training featuring LoRa Technology and real world applications: [www.semtech.com/IoT](http://www.semtech.com/IoT)



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200 Flynn Road, Camarillo, California 93012 • phone: (805) 498-2111 • fax: (805) 498-3804 • [www.semtech.com](http://www.semtech.com)