An Automated Sensor Network for Monitoring the Environmental Impacts of SMR Operations

Ming Huang, Reactor Chemistry and Corrosion Branch, Canadian Nuclear Laboratories

1. Objective: To study the feasibility of using an automated sensor network to monitor the environmental impacts of SMR operations.

2. Stakeholders: AECL(primary), CNSC, EC, and HC

3. Regulation:

CNSC REGDOC-1.1.5 *Licence Application Guide: Small Modular Reactor Facilities*

a. Effluent and emissions control (releases)

b. Environmental management system

c. Assessment and monitoring

d. Protection of the public

e. Environmental risk assessment

4. Data Needed:

Reliable measurements are required to monitor environmental pathways (air, water, ground conditions, tailings), specifically:

a. Physical characteristics

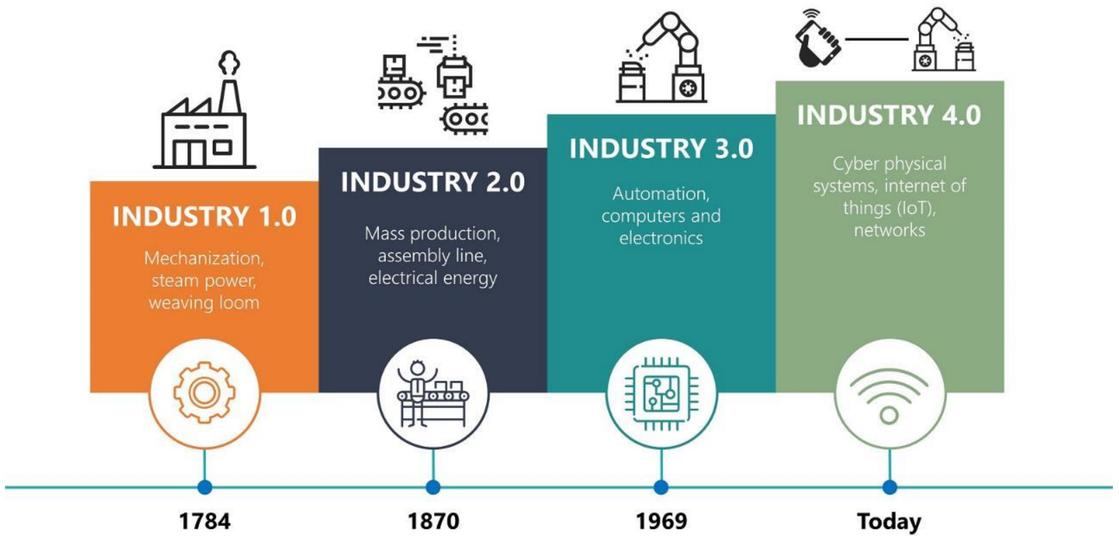
b. Chemical characteristics

c. Radiological characteristics

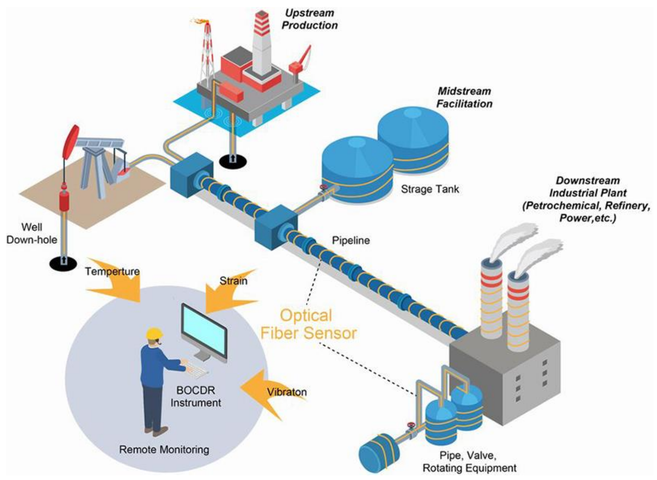
5. Current Progress:

Reviewing the recent advancements of radiochemical sensors and industrial automation, including wired sensor networks based on optical fibers, wireless sensor networks, and robotics.

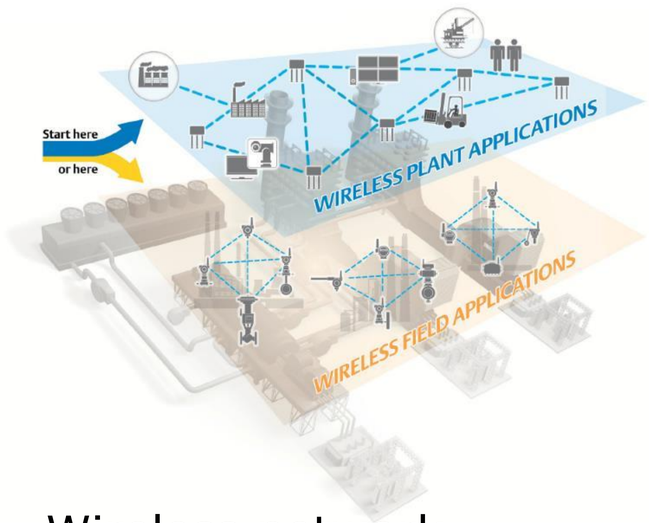
SMR: Site and environment
www.IAEA.org



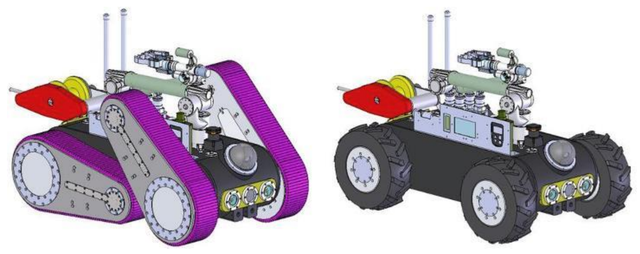
Evolution of industry
www.trilliummfg.ca



Optical fiber network
www.yokogawa.com



Wireless network
www.emerson.com



Robots: Just a supplement?
J. Field Robot., 33 (2016), pp. 931-945

6. Expected Outcome:

This is an one-year project. The outcome will be a report on the feasibility of monitoring environmental impacts of SMR operations using an automated sensor network.