May 21, 2024
Electric Power Development Co., Ltd.

J-POWER Uses Digital Technologies for Advanced Maintenance at Hydroelectric Power Plants

Proprietary AI Development; Expanded Internal Network Using Satellite Communications; Introducing Two Types of Patrol Robots

Electric Power Development Co., Ltd. (J-POWER, headquartered in Chuo-ku, Tokyo; President: Hitoshi Kanno) has done intensive demonstration testing of the latest digital technologies, since fiscal 2019, at Shimogo Power Station (Shimogo Town, Minamiaizu District, Fukushima Prefecture; output: 1 million kW, pumped storage). This power station, designated as a special digital zone, is advancing maintenance operations at hydroelectric power plants. Starting this fiscal year, J-POWER will strengthen and promote DX (digital transformation) by deploying several cutting-edge digital technologies, including the results obtained at the Shimogo Power Station, to other hydroelectric power plants through a collaborative project team of maintenance organizations from across Japan.

■Proprietary Development of AI to Detect Signs of Equipment Problems (JPPredict; internal project name)

J-POWER has built a system to prevent equipment problems that uses internally developed AI to detect signs of equipment failures and to notify maintenance staff. This system, called JPPredict, collects data from sensors attached to turbines and other equipment at hydroelectric power plants then stores the data on a centralized management server via a network.

■Expanded Application of Internal Network Using Satellite Broadband Communications[*]

J-POWER is improving the use of IoT devices, such as sensors attached to power generation equipment, inspection tablets, and surveillance cameras. We are developing an environment for remotely supporting maintenance operations by applying satellite broadband to high-speed, high-capacity communications on the company's internal network. This new system allows high-speed, high-capacity networks to be used even in deep mountainous regions where it is difficult to install optical fibers and where mobile phone signals do not reach.

■Introducing Two Types of Patrol Robots

J-POWER is working with Blue Innovation Co., Ltd., a company that specializes in integrated platforms for robots and equipment, to jointly develop and deploy robots that patrol key inspection areas within and around power plants. J-POWER was the first in Japan to introduce ANYmal, a four-legged inspection robot (developed by ETH Zurich and manufactured by ANYbotics) for hydroelectric power plants. This robot can operate even during emergencies such as disasters. J-POWER is working to optimize inspections as well as reduce the cost of introducing robots.

By leveraging cutting-edge digital technologies, J-POWER will promote the stable operation of power plants, improve the work environment for employees, and streamline maintenance. As a result, we will boost the competitiveness of hydroelectric power plants, a CO_2-free renewable energy source, and contribute to the steady supply of electricity.

*Related press releases:
  Using Starlink Satellite Broadband, J-POWER and KDDI Will Test High-Speed, High-Capacity
    Communications in Mountains to Ensure a Stable Power Supply
  Starlink Integration at a Hydroelectric Power Station in a Mountainous Region in Japan (October 26, 2023)
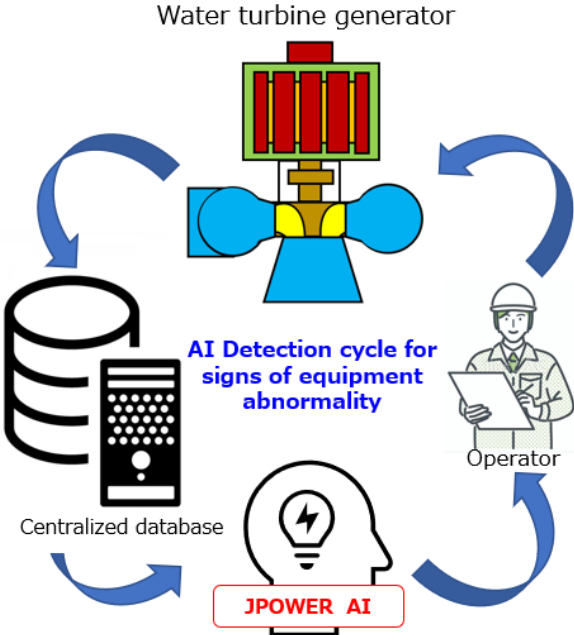
Joint development robot

Quadruped patrol inspection robot (ANYmal)