News Release
For Immediate Release

HITACHI

Hitachi develops “Metaverse Platform for Nuclear Power Plants” to enhance efficiency in construction and maintenance operations

Contributes to solving challenges faced by electric utilities, serving as the foundation for a “Data-Driven Power Plant” that enables optimized investment planning and plant maintenance.

- Combined Hitachi Group’s expertise in the nuclear energy business with its digital technologies to develop a platform utilizing a metaverse and AI solution.
- Streamlines operations from design, on-site construction and maintenance to asset management by enabling the sharing of site conditions with electric utilities and partners such as constructors through a high-precision digital twin of nuclear facilities in a metaverse.

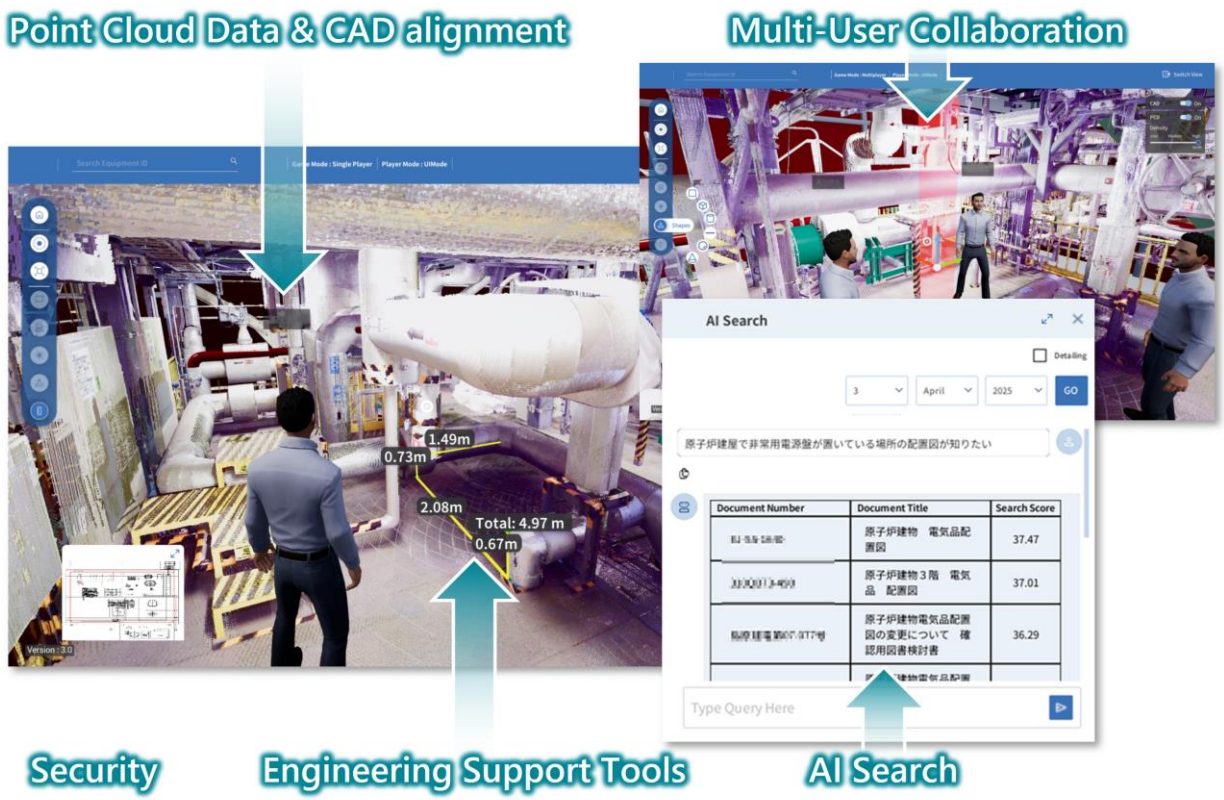


Image of virtual spaces recreated on-site and related functions in the Metaverse Platform for Nuclear Power Plants

Tokyo, July 9, 2025 Hitachi, Ltd. (TSE:6501, "Hitachi"), announced today the development of a new “Metaverse Platform for Nuclear Power Plants” that leverages a metaverse and AI technology to streamline operations, including nuclear power plants’ safety enhancement, new plant construction, maintenance, and decommissioning. The platform recreates nuclear power plants in a metaverse using high-precision point cloud data and 3D CAD data, and aims to enhance productivity in information sharing, schedule coordination, and asset management among stakeholders by utilizing it with partners such as electric utilities and contractors.

It is also designed to serve as the foundation of a “Data-Driven Power Plant,” which we aim to establish to address the diverse needs and challenges faced by electric utilities—such as

improving equipment reliability, enhancing work management, and increasing operational efficiency—through data-driven value creation and problem-solving. This new platform embodies Lumada 3.0, which uses Hitachi's domain knowledge and AI to convert data into value to solve challenges faced by customers and society, and was developed together with GlobalLogic as One Hitachi, integrating Hitachi's decades-long expertise in the nuclear energy business with its Group-wide advanced digital technologies. The platform facilitates the collection, aggregation, and analysis of on-site data, thereby supporting optimal investment planning and plant maintenance through data-driven insights.

Background

In the installation of new equipment or modification in nuclear power plants, precise planning and reliable execution are essential to complete on-site work within the shortest possible timeframe. However, access to nuclear power plants is often restricted by regulations, limiting the frequency and duration of site surveys. In some cases, controlled zones are not accessible during operation, restricting on-site surveys. These constraints require extensive coordination among stakeholders, with electric utilities playing a central role in sharing information and revising work plans.

Moreover, following the Great East Japan Earthquake, all domestic nuclear power plants were shut down for extended periods. During this time, the industry experienced a wave of retirements among highly skilled and knowledgeable personnel, a decline in on-site training opportunities for new plant construction, and a shrinking labor force due to demographic changes such as an aging population and declining birthrate. These factors have made knowledge transfer and productivity enhancement pressing challenges across the nuclear sector.

In response, Hitachi has developed the Metaverse Platform for Nuclear Power Plants to further enhance productivity by enabling accurate understanding and seamless sharing of site conditions among stakeholders, real-time schedule coordination, and reduction of rework.

Key Features of the Metaverse Platform of Nuclear Power Plants

(1) Point Cloud Data & CAD alignment
Overlays high-precision, high-density point cloud data[*1] and 3D CAD[*2] models to recreate nuclear power plants in a metaverse. This enables precise verification of site conditions and identification of discrepancies between drawings and actual structures.
(2) AI Search
Incorporates natural language processing to allow full-text and synonym-based searches of design documentation. Location and equipment-specific data in the metaverse enhances search accuracy.
(3) Multi-User Collaboration
Supports simultaneous access to the metaverse by multiple users, facilitating real-time communication and decision-making across geographically dispersed stakeholders.
(4) Engineering Support Tools
Offers centimeter-level measurement capabilities, virtual meetings, annotation, file attachment to specific equipment or areas, equipment layout search, and asset information linking functions to assist engineering operations.

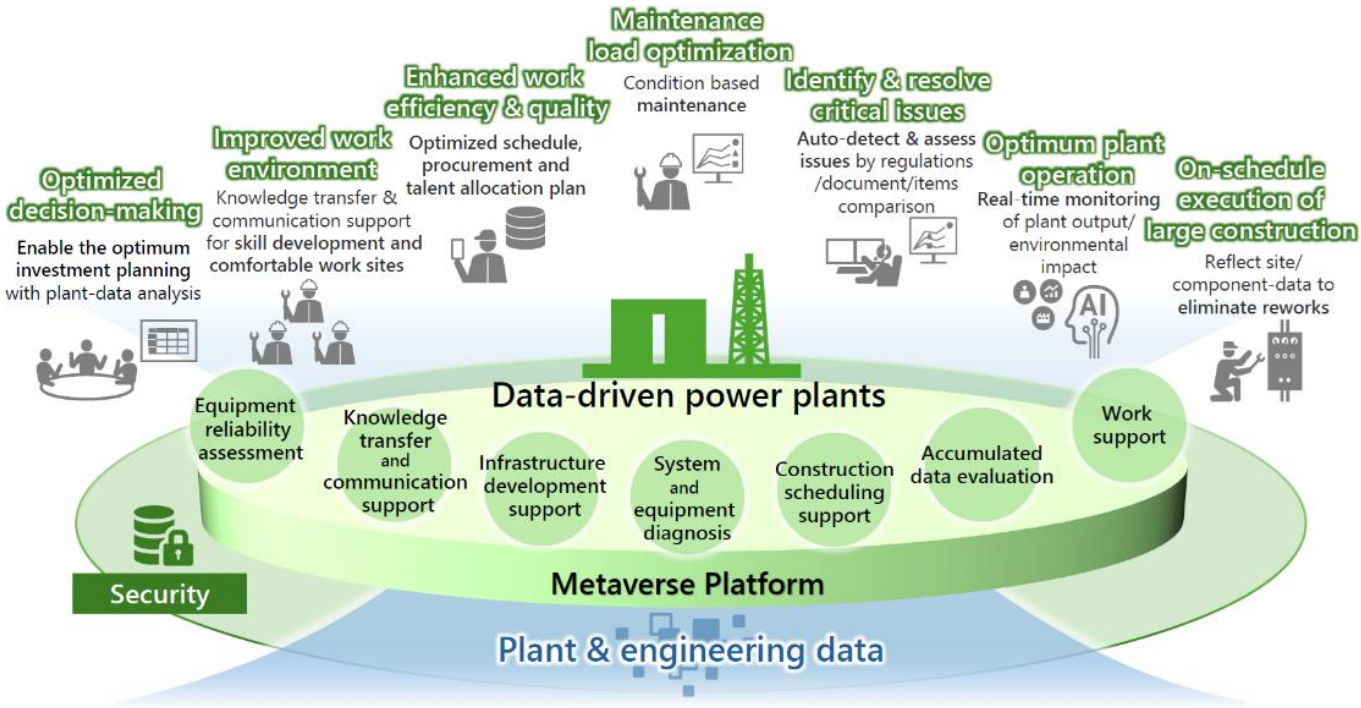
(5) Security
Ensures secure communication through encrypted interactions in the metaverse and access control limited to authorized users.

*1 A dense collection of spatial points captured by 3D scanners or cameras, used to represent the shape of objects or environments in three dimensions.

*2 Computer Aided Design software used for creating and editing engineering drawings and models digitally.

Future Applications and Vision

The Metaverse Platform for Nuclear Power Plants is designed to serve as the foundation for a “Data-Driven Power Plant”, enabling the collection, aggregation, and analysis of on-site data such as equipment conditions. This will facilitate optimal investment and maintenance planning by detecting failures in advance and predicting future equipment conditions, thereby realizing data-driven decision-making. This enables Hitachi to address the diverse needs and challenges faced by electric utilities—such as improving equipment reliability, enhancing work management, and increasing operational efficiency—through data-driven value creation and problem-solving.



Conceptual image of a data-driven power plant

Website of the Metaverse Platform for Nuclear Power Plants

https://www.hitachi.com/products/energy/nuclear/digital_ai/nuclear_metaverse/index.html

Introduction at Hitachi Social Innovation Forum 2025 JAPAN, OSAKA

The Metaverse Platform of Nuclear Power Plants will be showcased at "Hitachi Social Innovation Forum 2025 JAPAN, OSAKA" held on July 17th (Thu).
Learn more about the service at " BS01-03: Integrating Energy and Digital Technology for a Sustainable Future" (July 17th 11:50~12:40) and the exhibition “EX01-04: Next-Generation Workstyles in the Nuclear Industry Using Hitachi’s Metaverse.”
For more information on "Hitachi Social Innovation Forum 2025 JAPAN, OSAKA", please visit the official website at: https://www.service.event.hitachi/en/regist/

About Hitachi, Ltd.
Through its Social Innovation Business (SIB) that brings together IT, OT(Operational Technology) and products, Hitachi contributes to a harmonized society where the environment, wellbeing, and economic growth are in balance. Hitachi operates globally in four sectors – Digital Systems & Services, Energy, Mobility, and Connective Industries – and the Strategic SIB Business Unit for new growth businesses. With Lumada at its core, Hitachi generates value from integrating data, technology and domain knowledge to solve customer and social challenges. Revenues for FY2024 (ended March 31, 2025) totaled 9,783.3 billion yen, with 618 consolidated subsidiaries and approximately 280,000 employees worldwide. Visit us at www.hitachi.com.

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
