New system that helps predict worksite hazards using Hitachi's next-generation AI agent Naivy demonstrates enhancements of on-site safety while boosting efficiency

Aiming to create a safe workplace for everyone by improving quality of risk controls
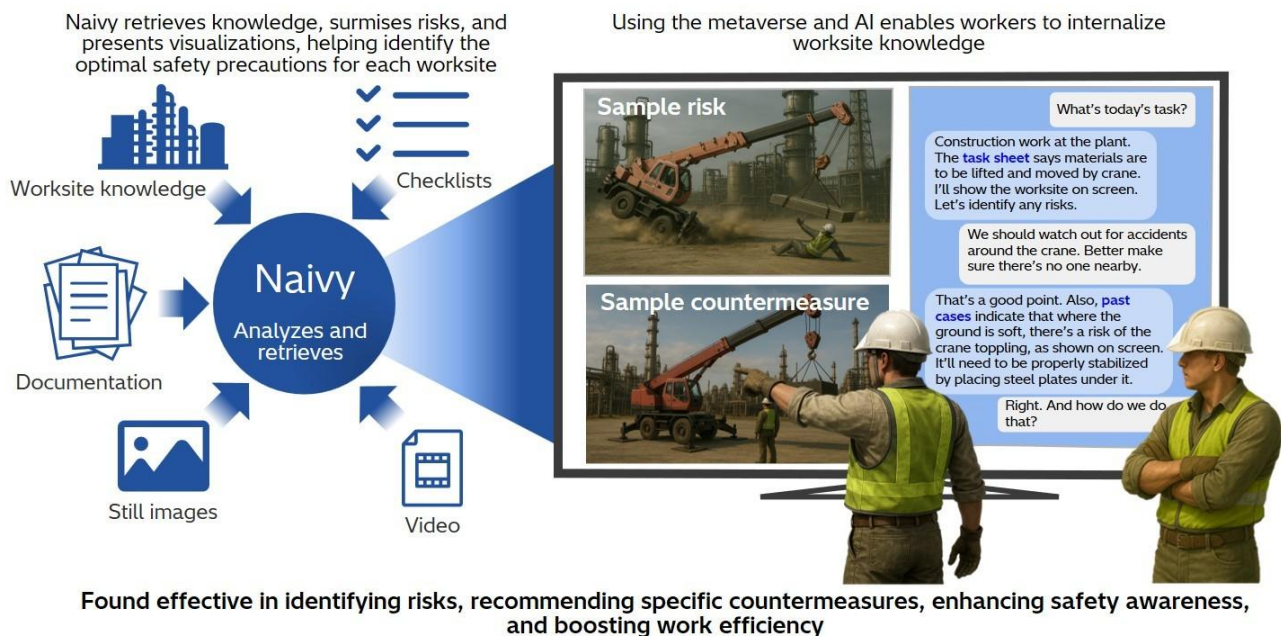

Figure 1. How the risk and hazard prediction support system enhances worksite safety by helping forecast hazards

Tokyo, October 7, 2025 Hitachi, Ltd. (TSE:6501, "Hitachi") and Hitachi Plant Construction, Ltd. ("Hitachi Plant Construction") have developed a new risk and hazard prediction[*1] support system designed to enhance worksite safety using the next-generation AI agent "Frontline Coordinator – Naivy" ("Naivy")[*2] to help forecast hazards. The system, a specific use case of Hitachi's Advanced On-Site Safety Solution,[*3] increases the comprehensiveness and immediacy of information, the lack of which has been an issue with traditional hazard prediction training using paper or whiteboards. The system realistically recreates the worksite in the metaverse, and Naivy, the core component, instantly analyzes and retrieves similar past cases. In addition to verifying safety procedures and rendering hazardous locations visually, the system also presents visualizations of potential risks and optimal safety precautions for each site in a way that is intuitive for workers. It thus creates an environment where workers can proactively identify risks specific to their worksite and formulate effective countermeasures. Hitachi Plant Construction has conducted multiple pilot tests on this system at a client's substation. These tests found that the system enhanced workers' safety awareness while reducing the time required for hazard prediction training by approximately 20 percent, thus ensuring safety without sacrificing efficiency.

Going forward, Hitachi and Hitachi Plant Construction will further evolve Naivy by drawing on our knowledge and expertise in improving workplace safety as well as the new domain knowledge gained through collaboration between workers and Naivy. While promoting the use of on-site domain knowledge, we will deploy Naivy across industrial sectors such as construction, electric power, railways, manufacturing, and maintenance as part of the suite of applications that embody Lumada 3.0. This will contribute to enhancing frontline workers' efficiency and well-being and creating a safe workplace for everyone.

Some of the project outcomes will be on display at CEATEC 2025 at Makuhari Messe in Chiba, Chiba Prefecture, from October 14 to 17, 2025.

*1 risk and hazard prediction: It refers to reducing the risk of occupational hazards and preventing accidents by identifying in advance unsafe conditions, behaviors, and mental states lurking in the workplace. It also embraces wider evaluation of risks, incorporating elements of risk assessment.
*2 Hitachi develops "Frontline Coordinator – Naivy" as a next-generation AI agent that helps alleviate the psychological burden on frontline workers and enhance work efficiency : July 3, 2025
*3 Hitachi's AI agent and NVIDIA's technology advanced on-site safety by verifying safety procedures and visually rendering hazardous locations with the goal of eliminating occupational hazards : July 8, 2025 [in Japanese]

Background and issues

The workload on industrial worksites is increasing as the workforce shrinks and the number of skilled workers declines. Therefore, establishing a good working environment, achieving work efficiency, and ensuring safety by preventing accidents and injuries have become major social concerns in terms of enhancing business continuity. By developing Naivy and applying it to facility management sites, Hitachi has been helping to alleviate the psychological burden on frontline workers and enhance work efficiency. Meanwhile, upgrading hazard prediction training is essential to fostering a culture of safety on-site and preventing worksite accidents. Traditional hazard prediction training, however, relies primarily on paper or whiteboards, making only limited use of past accidents and risk information. This makes it difficult to share potential risks and optimal safety precautions tailored to conditions on each site, posing ongoing risks of work accidents that result from oversight or false assumptions. Addressing this issue in a way that improves worksite safety and enhances business continuity requires an environment that gives everyone access to accurate information about risks on site and empowers workers to think proactively about work safety themselves.

Features of the technology developed to address the issue

Hitachi and Hitachi Plant Construction have therefore developed a risk and hazard prediction support system designed to enhance worksite safety by helping forecast hazards. The system utilizes Naivy while integrating Worksite-Augmenting Metaverse[4] with know-how on hazard prediction training. The result is a "One Hitachi" solution that brings together the wide-ranging domain knowledge and AI technology that Hitachi has developed globally with Hitachi Plant Construction's cumulative expertise in the construction and maintenance of power plants and substations. The system visualizes potential risks and optimal safety precautions in accordance with site-specific conditions. Its main features are as follows.

1. Helping internalize risk controls by creating a sense of "being there" and rendering know-how visually

The system recreates the worksite in the metaverse using Worksite-Augmenting Metaverse. Naivy then sets to work in the metaverse on integrating, searching, and visualizing knowledge from multiple information sources previously managed separately, including past accidents, knowledge bases, and the latest work photos. By visually recreating the worksite and presenting relevant information in one place, the system enables workers to intuitively understand potential risks in their workplace and think proactively about what risks exist and the factors behind them. It creates an environment conducive to formulating effective risk controls and strengthens safety awareness by getting workers to internalize safety.

2. Helping optimize safety precautions for each site by intelligently reinforcing risk identification and controls

By analyzing data and know-how gathered on site, Naivy promptly identifies potential risks and recommends optimal countermeasures in accordance with the nature of the work being performed and on-site conditions. Say, for example, a crane is being used at a construction site, and there is a risk of the crane toppling. During an hazard prediction training session, a worker might suggest countering the risk by placing steel plates under the crane to keep it level. Naivy will then point out the possibility that the ground is soft and make a specific recommendation that reinforces the original suggestion, such as placing larger steel plates. With Naivy proposing specific countermeasures, the system supports the implementation of safety precautions tailored to each worksite's risk profile and the nature of the work performed there. This helps foster a culture of safety on site.

*4 Hitachi develops Worksite-Augmenting Metaverse, a fusion of worksite data-collection technology and generative AI : December 18, 2023

Demonstrated benefits

Hitachi Plant Construction has conducted pilot tests on this system at a client's substation. These tests found that the system improved safety awareness by making workers more cognizant of potential risks and more prepared to suggest specific countermeasures. Their ability to identify potential risks and ways to counter them was particularly enhanced by how Naivy instantly analyzed and retrieved information such as past accidents, knowledge bases, and work photos. Moreover, the system was also found to be effective in boosting work efficiency: By expediting access to the necessary information, it reduced the time required for hazard prediction training by approximately 20 percent and streamlined decision-making. A questionnaire elicited comments from workers, including: "The past accidents and knowledge bases are easy to understand." "It's easy to identify unsafe behaviors using work photos." "In the metaverse, you can intuitively understand which areas are safe and which are dangerous." This demonstrates that the system is helping to ensure worksite safety without sacrificing efficiency.

Figure 2. A hazard prediction training session using the system

Looking ahead

By expanding Naivy-driven applications, Hitachi and Hitachi Plant Construction will further evolve Naivy as a core technology underpinning Lumada 3.0 and the HMAX suite of solutions embodying it. We will continue working to help solve major social challenges like alleviating the psychological burden on workers and enhancing worksite safety across a wide range of sectors, including construction, electric power, railways, and manufacturing. Further, we will accumulate the new domain knowledge obtained through collaboration between workers and Naivy and expand our fields of support. In addition, we will strengthen coordination with the Worksite Safety Enhancement Solution incorporating the NVIDIA Omniverse technology and accelerate real-world deployment via co-creation with a wide range of clients and partner companies. Through these initiatives, we will help create a safe workplace for everyone and contribute to the realization of a Harmonized Society—one in which the environment, well-being, and economic growth are in balance.

Where to find the Hitachi booth

General Exhibits Area, International Exhibition Hall 5, Makuhari Messe (Booth No. 5H220)

About CEATEC 2025

Dates: Tuesday, October 14–Friday, October 17, 2025
Venue: International Exhibition Halls 1–6, Makuhari Messe, 2-1 Nakase, Mihama-ku, Chiba City,
        Chiba Prefecture
CEATEC 2025 Innovation for All official website

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.

About Hitachi Plant Construction,Ltd.

Hitachi Plant Construction builds and connects the social and industrial infrastructure essential to people's lifestyles by delivering clean power plants without CO_2 emissions, substations broadly providing power from those plants, railroad equipment supporting society using that energy, and other equipment through engineering, construction, and services.

For more information on Hitachi Plant Construction, please visit the company's website at https://www.hitachi-plant-construction.com/.

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