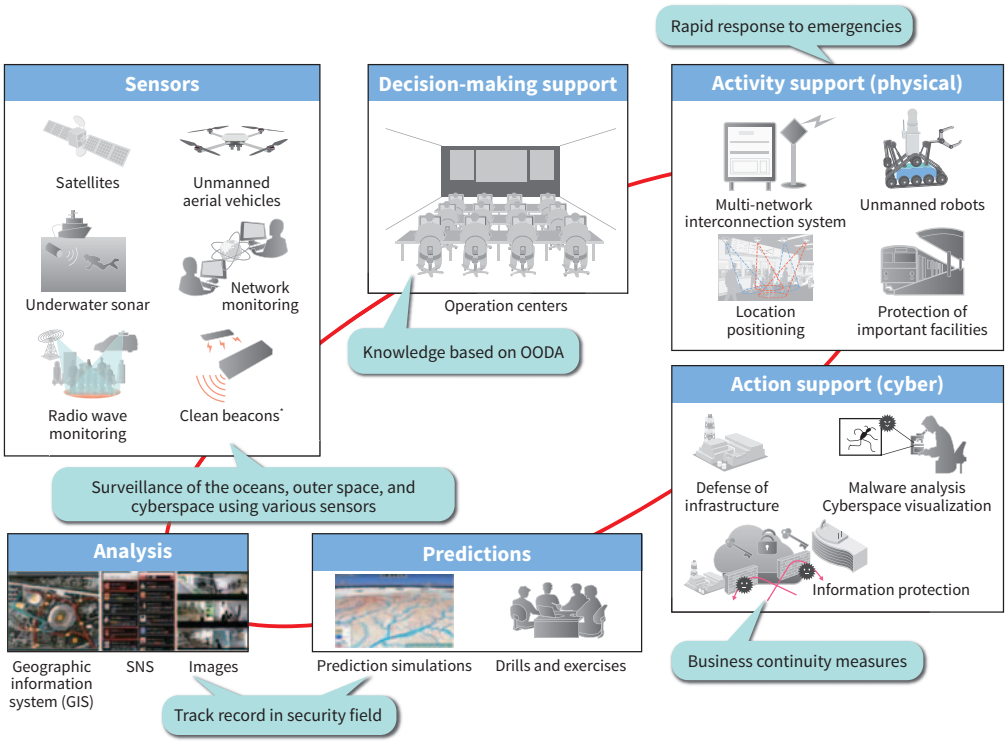
Security Technologies for Social Infrastructure

1 Wide-area Surveillance and Security Solutions

Hitachi uses the system security concept, which focuses on measures that are adaptive, responsive, and cooperative, to deal with security requirements for protecting social infrastructure, such as urban areas, public transport, and major critical infrastructure, from threats such as natural disasters, cyber-attacks, and terrorism, and supplies wide-area surveillance and security solutions that provide appropriate ongoing measures compliant with the International Organization for Standardization (ISO) 22320 standard for emergency management.

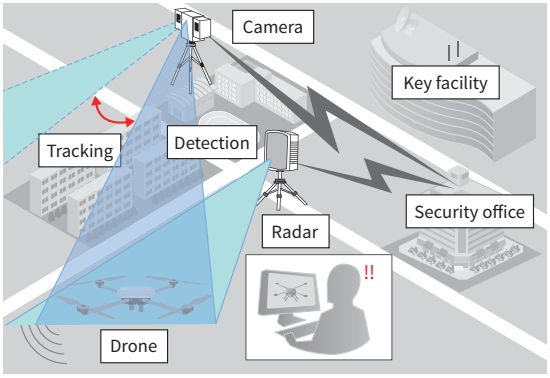
Specifically, these solutions perform multi-faceted monitoring of social infrastructure using satellites, unmanned aerial vehicles, and sensors for radio wave monitoring, network monitoring to assess the ever-changing situation for both physical and cyber threats, and uses real-time processing to automatically detect signs of anomalies. This process includes analyzing and predicting information using geographic information systems (GIS), image analysis, and simulation techniques, and providing accurate decision-making support that includes providing knowledge based on the observe, orient, decide, and act (OODA) process. Furthermore, location positioning, information sharing, and other solutions are used to support rapid responses. Drills and exercises simulating actual crises are also conducted to provide support for minimizing potential damage. The system can be installed quickly thanks to a flexible choice of system configurations based on the operation and existing equipment.



SNS: social networking services OODA: observe, orient, decide, and act

* A beacon equipped with photovoltaic panels and capable of 24-hour operation even under indoor lighting and other low-light environments

1 Security solutions covering the entire social infrastructure



2 Drone detection system in operation

2 Drone Detection System for Rapidly Discovering Rogue Drones

Today, drones are used for a wide range of applications, including surveying, delivery, and assessing disaster sites. However, crimes using drones, such as unauthorized access to key facilities, have also occurred, and this has resulted in a growing need for effective security measures against rogue drones. This led Hitachi to develop a drone detection system that discovers drones using radars and cameras.

This system uses radars to detect rogue drones and controls cameras to track those drones based on the detection information to enable monitoring of a wider area than visual monitoring. In addition, the radars and cameras are linked to map software for displaying the intrusion path, detected position, video, and other details of the rogue drones on the map software to enable rapid response by security staff.

Hitachi anticipates this system will be widely adopted in the security market, and will continue contributing to enhanced safety and security in society by adding new and improved functions to the system in response to customer requests.

3 3D Underwater Acoustic Video Camera

Technologies that enable highly efficient, low-cost investigation of ocean mineral resources, such as seafloor hydrothermal deposits, cobalt-rich ferromanganese crusts, and deep-sea sediment with a high concentration of rare-earth elements (rare earth-rich mud), are being developed under a government-led initiative called the Cross-ministerial Strategic Innovation Promotion Program (SIP) Next-generation Technology for Ocean Resources Exploration (Zipangu in the Ocean program).

Exploration of resources on the deep seafloor uses remote-controlled vehicles referred to as remotely operated vehicles (ROVs). ROVs use a robot arm to collect samples of seafloor mineral resources and install underwater equipment, and their operational status is monitored by optical cameras. However, ocean currents and the water flow from the thrusters of the ROV itself can stir up mud on the seafloor and cause the ocean water to become cloudy, which can impair monitoring of the operational status by optical cameras.

For this reason, in tandem with the Port and Airport Research Institute (PARI), which is a National Research and Development Agency and part of the National Institute of Maritime, Port and Aviation Technology, Hitachi is leveraging its underwater acoustic technology to conduct development on 3D underwater acoustic video cameras using sound waves to enable monitoring of the operational status of ROVs even in cloudy ocean waters.

3 3D underwater acoustic video cameras [for deep ocean (left), and for shallow ocean (center)], and a video sample (right)