

# Introduction of Japanese Technology in Airports

**Council for International  
Development of Aviation Infrastructure**



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# 1. Terminal

# 1-1. CFT(Concrete filled Steel Tube)



Category	Area	Terminal Construction and Installations
	Theme	Advanced and high quality of maintenance

## Product Summary

- A Concrete Filled Steel Tube (CFT) is a simple structural member that does not require assembling of reinforcements or a mold. This is because concrete is poured into a round-or square-shape steel pipe and a column is created. It is superior in view of strength, rigidity, and deformability.

## Features

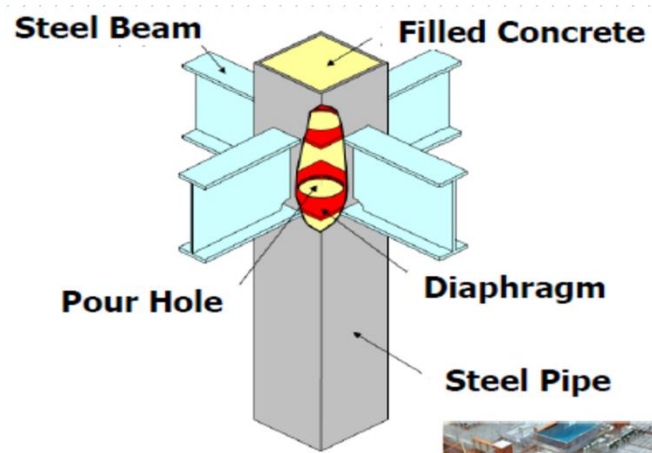
- This product is superior in fireproof and anti-earthquake performance.
- A smaller column cross section area allows more extensive utilization of space is otherwise possible.
- It is possible to shorten the construction period because a mold is not necessary.

## Applications

- Large-space buildings, such as spaces inside passenger terminal building

## Past Installations

- Japan : ○ Building, Hotel and Hospital(s)
- Overseas : ○ airport(s)



採用例：三田ベルジュビル CFT 柱

## Contact Information

Atsushi Sugawara  
Overseas Business Division,  
Energy Industries Engineering Sector,  
JFE Engineering Corporation  
TEL: +81-45-505-7385  
E-mail: [sugawara-atsushi@jfe-eng.co.jp](mailto:sugawara-atsushi@jfe-eng.co.jp)



# 1-2. Fuel Stock Management System



Category	Area	Terminal Construction and Installations
	Theme	Advanced and high quality of maintenance

## Product Summary

### Fuel stock management system for inventory, custom and operation in international airport

- Inventory management for unloading and loading by oil companies and airline companies
- Management of customs bonded fuel oil for foreign aircrafts and declaration documentation.
- Management of refueler/server truck operation and quality control sampling.

## Features

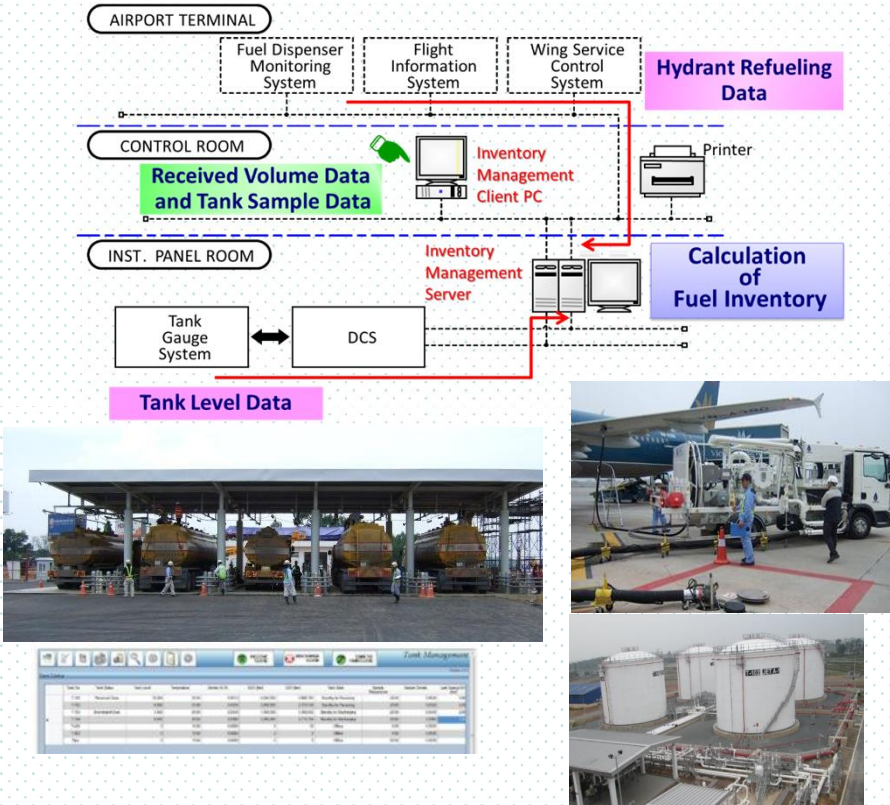
- Automatic and systematic management.
- Management software optimized to each airport

## Applications

- Fuel filling facilities

## Past Installations

- Japanese Airports: Narita, Kansai
- Overseas Airports:(Vietnam) Noi Bai



## Contact Information

Hattori Shinya  
 Overseas Business Division,  
 Energy Industries Engineering Sector,  
 JFE Engineering Corporation  
 TEL: +81-45-505-7545  
 E-mail: [hattori-shinya@jfe-eng.co.jp](mailto:hattori-shinya@jfe-eng.co.jp)



# 1-3. Fuel Leak Detection System



Category	Area	Terminal Construction and Installations
	Theme	Security and Safety

## Product Summary

- A Leak detection system for underground fuel pipelines
- 1) Direct detection system
  - Leak detection by cable impedance and conductor change
  - Leak detection by pressure change of protection pipe gas
- 2) Indirect detection system
  - Leak detection by pressure change of packed pipeline

## Features

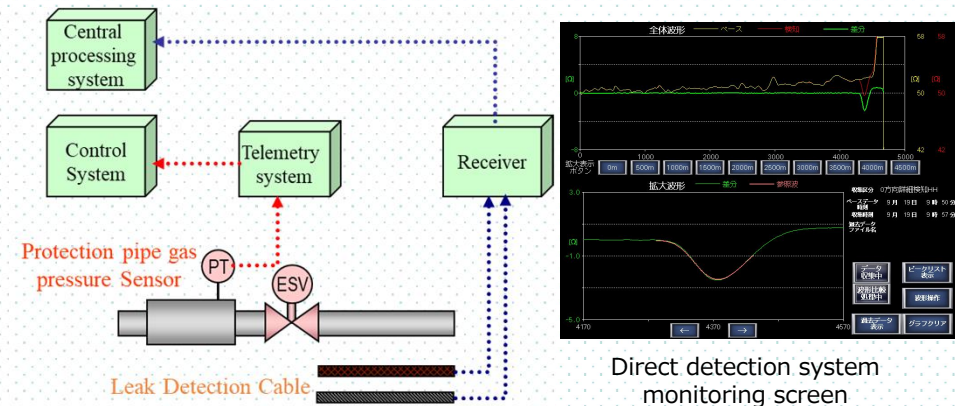
- Environmental conservation measures
- High reliability (direct detection system)
- Low cost (indirect detection system)

## Applications

- Apron (fuel oil supply pipelines)

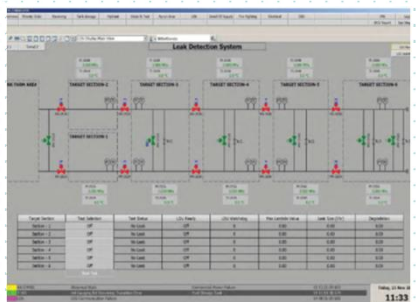
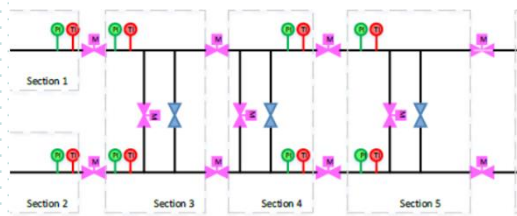
## Past Installations

- Japanese Airports: Narita, Kansai
- Overseas Airport: (Vietnam) Noi Bai



Direct detection system monitoring screen

### Indirect detection system



Indirect detection system monitoring screen

## Contact Information

Hattori Shinya  
Overseas Business Division,  
Energy Industries Engineering Sector,  
JFE Engineering Corporation  
TEL: +81-45-505-7545  
E-mail: [hattori-shinya@jfe-eng.co.jp](mailto:hattori-shinya@jfe-eng.co.jp)





# 1-4. clip EAR



Category	Area	Terminal Operations
	Theme	Improving passenger convenience

## Product Summary

- Used via Bluetooth connection with a smartphone
- Intercom tunes translation app for ease of use
- Earphones with high-capacity battery with 100-language translation and unlimited distance intercom

## Features

- Unlimited distance intercom, 100-language translation available
- Easy control of apps with a single button on the earphone
- Can be used for business purposes with one earphone
- Equipped with a high-capacity battery that can be used for long hours

## Applications

- Passenger Terminal Information Counters, etc.
- Recommended for use in a relatively quiet environment

## Past Installations

- Haneda Airport (Terminal 1 Information Counter)
- Haneda Airport (Terminal 3 International Information Counter)



## Contact Information

- donut robotics Customer Support  
TEL: +81-03-6804-6139  
E-mail: [cs@donutrobotics.com](mailto:cs@donutrobotics.com)  
URL: <https://en.donutrobotics.com/clip-ear>
- Japan Airport Terminal Co.,Ltd.  
Business Promotion Office (Sales Agent)  
TEL: +81-3-5757-8181  
E-mail: [eigyoku-suishin@jat-co.com](mailto:eigyoku-suishin@jat-co.com)



# 1-5. One-ID Facial Recognition Technology



Category	Area	Terminal Operations
	Theme	Improving passenger convenience

## Product Summary

- With the One-ID facial recognition technology, departing flight passengers who preliminarily register their faces in a predetermined way can go through procedures inside an airport (ticketing, baggage check-in, security check and boarding check) by just showing their faces without presenting their passports and tickets

## Features

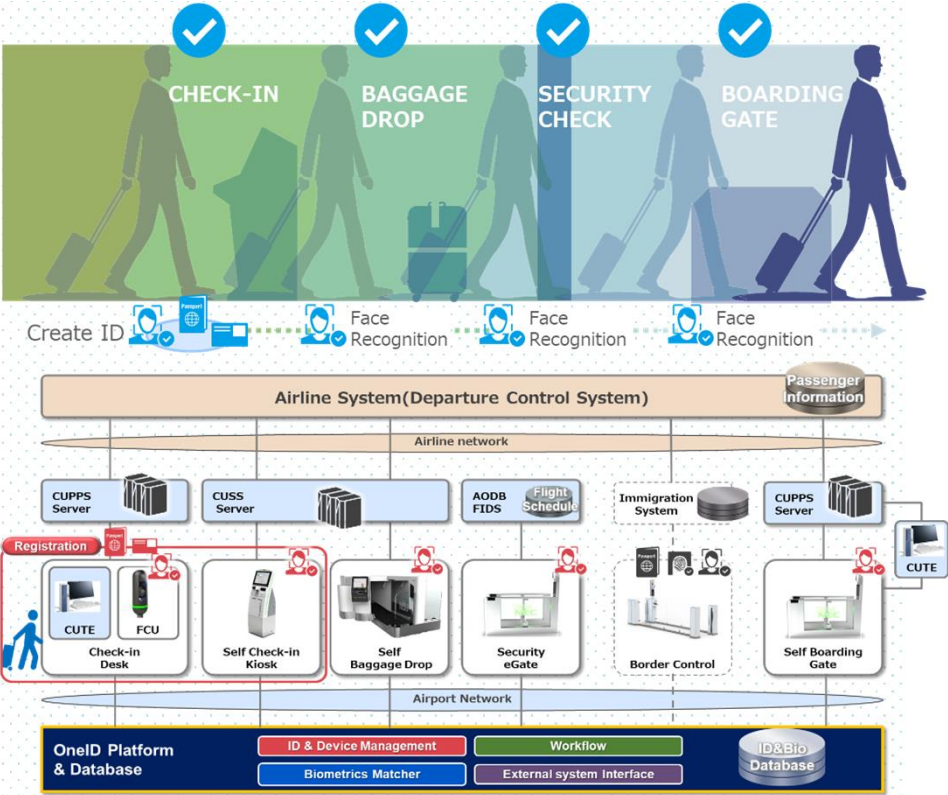
- A facial recognition engine having the world highest authentication accuracy has achieved flight passenger authentication with higher accuracy than visual confirmation of staff.
- Walk-through procedures (without asking passengers to stop) contribute to alleviating congestion and improving throughput of passengers per unit time (enabling boarding time to be reduced by 11 minutes or more)

## Applications

- Airports

## Past Installations

- Japan : Narita and Haneda airports
- Overseas : Atlanta, Frankfurt and Munich, etc.



## Contact Information

Ae Uchikura  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
URL: <https://www.nec.com>

# 1-6. cocobo



Category	Area	Terminal Operations
	Theme	Improving passenger convenience, Security and Safety

## Product Summary

- The security robot providing security services such as static guard/patrol and inspection of trash bin and suspicious things with utilizing cutting-edge technology such as AI and 5G.
- The image recorded by cameras installed on its body is analyzed by AI in real-time and sent to a disaster prevention center with encryption signal.

## Features

- Patrol with autonomous driving (Route configuration required)
- Provide information by its LED display
- Remote communication with a disaster prevention center
- Threatening function with sound and light

## Applications

- Inside Passenger Terminal Building

## Past Installations

- Japanese airport : Narita

## Specifications

### Main functions

**Autonomous driving and automatic charging**  
Autonomous driving on roads with obstacles and unevenness  
Collision avoidance by automatically detecting obstacles  
Automatically charged according to remaining battery

**Detection of loitering and fallen persons**  
Image AI and sensors can detect loitering and fallen persons and notify the monitoring center

**Abnormal sound detection**  
Detecting abnormal and loud sounds, then notifies the monitoring center



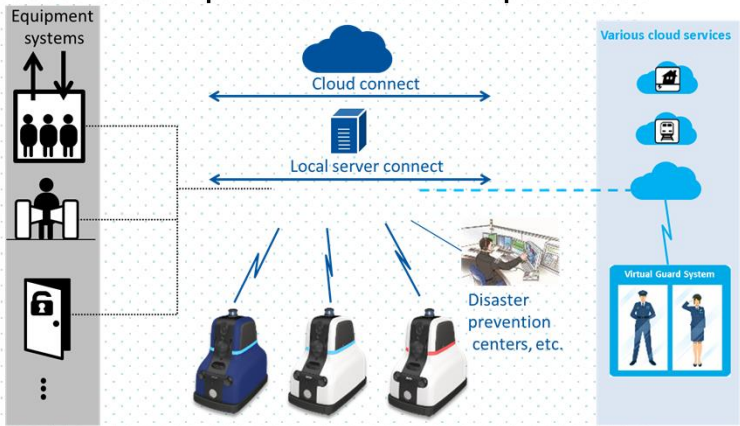
**Gas and fire detection**  
Gas leak detection by gas sensor  
Fire Monitoring with Thermal Image Sensor

**Detection of leftover objects**  
Image AI and sensor can detect unattended objects and notify the monitoring center

**Inspection by arm**  
Inspection using thermal image sensor and visual camera  
Detecting heat sources, then notifying the monitoring center

<Optional devices> Sensor arm, front lights (warning and camera lighting), smoke emitting device

## Operation Example



※ Connection with facility systems, cloud, etc. is an option.  
※ Details need to be discussed for integrations, and onsite surveys will be required.

## Contact Information

PIC: Keita FUKUSHIMA (Mr.)  
International Business Division  
SECOM CO., LTD.  
TEL: +81-80-9022-5782/+81-3-5775-8345  
E-mail: [kei-fukushima@secom.co.jp](mailto:kei-fukushima@secom.co.jp)  
[global@secom.co.jp](mailto:global@secom.co.jp)



# 1-7. Virtual Keibi\* System

\* Keibi=Security



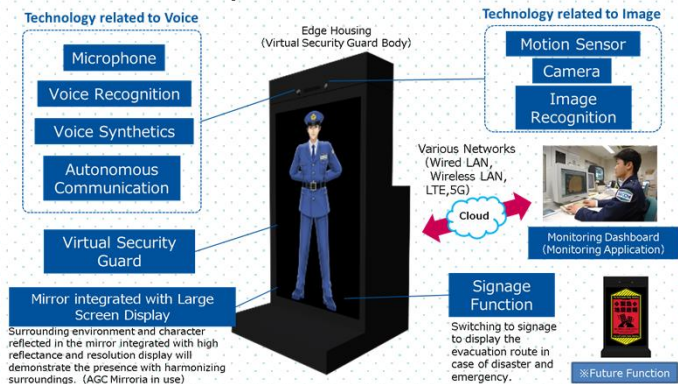
Category	Area	Terminal Operations
	Theme	Improving passenger convenience, Security and Safety

Product Summary
Features
Applications
Past Installations

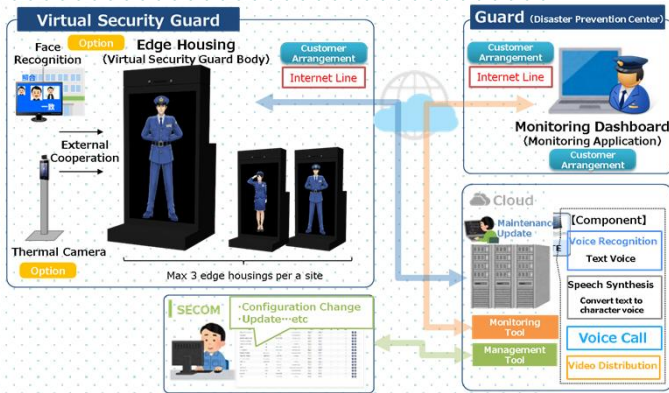
- Providing security guard service such as alert surveillance and reception with the display integrated mirror displaying 3D character.
- Efficient personnel allocation will be realized by utilizing a virtual security guard for alert surveillance and reception work, in combination with skillful security guards conducting advanced support.
- Advanced Alert Surveillance Utilizing AI:  
Promptly notify when emergency is detected.
- Reception Service:  
Able to conduct reception correspondence based on preconfigured scenario.
- Integrated with Security Guard Service:  
Efficiency and security reinforcement can be realized.
- Remote Support utilizing Cloud:  
Remotely update scenario and guide maps.
- Passenger Terminal Building, and other facilities in airport.

N/A

## Specifications



## Operation Example



## Contact Information

PIC: Keita FUKUSHIMA (Mr.)  
International Business Division  
SECOM CO., LTD.  
TEL: +81-80-9022-5782/+81-3-5775-8345  
E-mail: [kei-fukushima@secom.co.jp](mailto:kei-fukushima@secom.co.jp)  
[global@secom.co.jp](mailto:global@secom.co.jp)



# 1-8. Robot Floor Cleaner EGrobo



Category	Area	Terminal Operations
	Theme	Advanced and high quality of maintenance

## Product Summary

- The “EGrobo” robotic floor cleaner cleans floors automatically.
- “EGrobo” can be used to clean large areas unattended.
- Stable cleaning quality can also be maintained.

## Features

- The robot's travel routes and tasks can be easily learnt by the teaching system.
- Minimises the impact of manpower shortages (personnel availability) and improves the overall efficiency of the cleaning operation and maintains its aesthetics.
- Reduces accidents caused by operator’s error and workload of the operator.

## Applications

- Inside Passenger Terminal Building

## Past Installations

- Japan : Haneda (Terminal Building Domestic), Chubu(Terminal Building Domestic and Access Plaza,Sendai (Terminal building)



## Contact Information

- AMANO Corporation  
Clean Systems Robotics Solutions Business Division  
Noriaki Yui  
TEL: +81-45-439-2206
- Japan Airport Terminal Co., Ltd.  
Sales Promotion Office (Sales Agent)  
TEL: +81-3-5757-8181  
E-mail: [eigyuu-suishin@jat-co.com](mailto:eigyuu-suishin@jat-co.com)



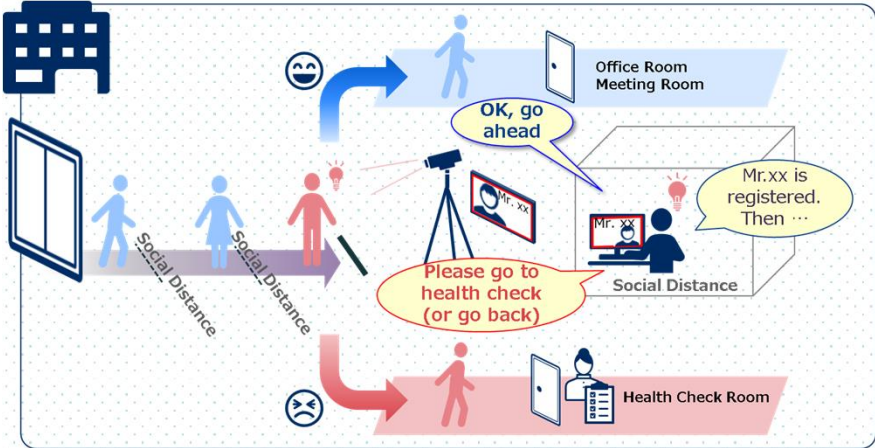
# 1-9. Infectious Disease Control Solution



Category	Area	Terminal Operations
	Theme	Security and Safety

Product Summary
Features
Applications
Past Installations

- Combination of facial recognition technology with the world’s leading accuracy and body surface temperature measurement allows quick identification of passengers who are suspected of suffering from infectious diseases, thereby contributing to reduction of infection risks.
- Contactless facial recognition and body surface temperature measurement are performed simultaneously. When a person whose body surface temperature has exceeded the set value has been recognized, it is possible to have a security guard to speak with such person and have the person take his/her body temperature.
- Locations in which many persons gather, such as airports
- Five airports in the State of Hawaii



## Contact Information

Ae Uchikura  
 Land, Infrastructure, Transport and Tourism  
 Solution Department, NEC Corporation  
 TEL: +81-3-3798-6683  
 E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
 URL: <https://www.nec.com>

# 1-10. Staff Operation System



Category	Area	Terminal Operations
	Theme	Security and Safety

## Product Summary

- Security guards are equipped with the wearable camera on their chest, and the live images through the wearable camera enables controllers to remotely give proper instruction to security guards.
- Beacons enable controllers to get the position of each security guard, therefore they can give an instruction to a security guard who is near the site where an incident occurs.

## Features

- Consideration for people nearby:  
A sign, "Recording" is indicated on the case of the wearable camera when it is in operation.
- Chat function with photos attached:  
Able to share incidents with other security guards on duty.

## Applications

- Inside Passenger Terminal Building

## Past Installations

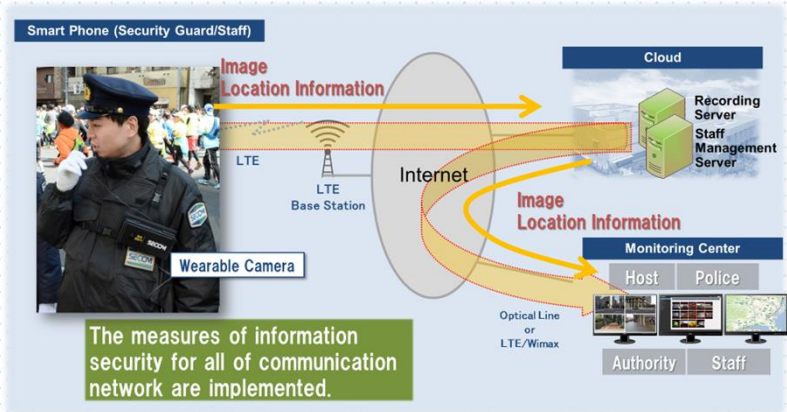
- Japanese airport: Haneda  
(Intl Terminal Building)

## Device used



Smart Phone+Special Case+Special Speaker Microphone/Earphone

## System Diagram



## Contact Information

PIC: Keita FUKUSHIMA (Mr.)  
International Business Division  
SECOM CO., LTD.  
TEL: +81-80-9022-5782/+81-3-5775-8345  
E-mail: [kei-fukushima@secom.co.jp](mailto:kei-fukushima@secom.co.jp)  
[global@secom.co.jp](mailto:global@secom.co.jp)



# 1-11. Automated Baggage Storage System Supported by AMR



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

## Product Summary

- Automatic baggage storage system using AMR
- Checked baggage are temporarily stored and are then transported to the handling area before departure time.
- The structure of this system can be configured according to the available space.

## Features

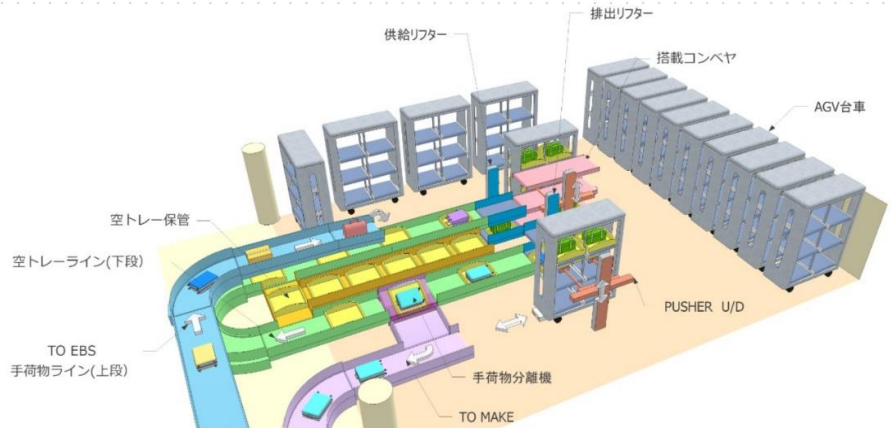
- Security is improved by eliminating human intervention.
- Mobil shelving that does not required stationary equipment.
- Highly flexible solutions that allows for increasing/decreasing of robots to match demand.
- A storage rack with shuttle system can be added to the mobile baggage transport robots for a complete storage solution.

## Applications

- Within the airport restricted area

## Past Installations

- World's first demo-prototype is being planned.



## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>



# 1-12. High Speed Belt Conveyor



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

## Product Summary

- World's fastest airport baggage handling systems feature our high speed belt conveyors.
- The system delivers high speed without special maintenance technology or extra cost.

## Features

- The system boasts a speed of 600 m/min, with a structure that has been certified by an international patent organization.
- Even at a speed of 600 m/min, the system consumes 70% of the power that is consumed by conventional systems (at 150 m/min) and has a noise level of 60% when compared to these systems. (Comparison done by TKK)
- Compared to the tray handling system, running costs may be lower.
- The belt conveyor type of system has higher performance and allows for continuous loading.

## Applications

- Within the airport restricted area

## Past Installations

- Japan: Inside Haneda Airport



## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>



# 1-13. High-speed Baggage Tray System for Conveying and Sorting



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

## Product Summary

- This high-speed Baggage Tray System used for transporting and sorting minimizes the damage to bags commonly seen in conventional systems.

## Features

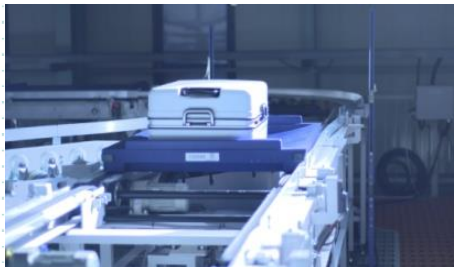
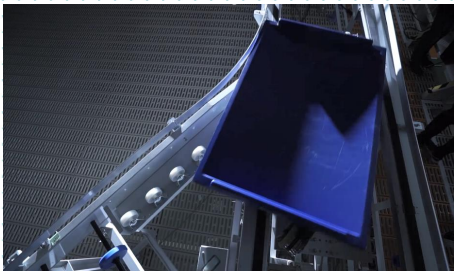
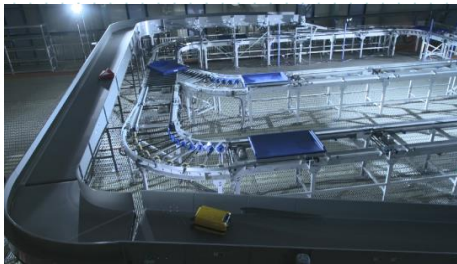
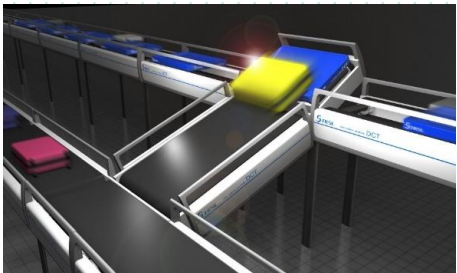
- System can reach speeds up to 600m/min, with an optimized, dedicated tray.
- Scanners built into the trays allow for reading of position data for accurate tracking of baggage throughout the system.
- Our independently developed dynamic sorting system sorts at high speed with little to no impact to baggage.

## Applications

- Within the airport restricted area

## Past Installations

- -



## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>





# 1-14. Belt Carry Sorter



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

## Product Summary

- We have the most cross-belt sorter installations in airports in the world.
- Highly controlled sorting action prevents baggage from getting damage.
- With systems still in operation 30 years after installation, our reliability speaks for itself.

## Features

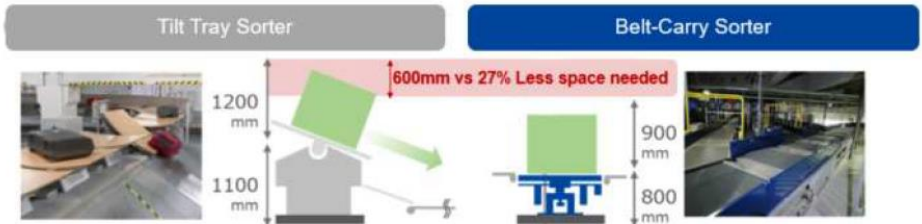
- Sorter with movable layers
- The belt conveyor allows for seamless diverting without damage for reliable data tracking.
- A solid track record and reputation of supporting 24/7 non-stop airport operation.
- Low noise and space saving (reduced height by about 30% compared to tilt-type systems)
- Energy saving support

## Applications

- Within the airport restricted area

## Past Installations

- Japan: Haneda Airport, Narita Airport, Chubu Airport
- Overseas: (Malaysia) Kuala Lumpur Airport



Kinetic energy supported belt drive system

## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>



# 1-15. Triplanar



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

## Product Summary

- Highly durable baggage transportation system with a track record of over 30 years of operation
- Designed to ensure the safety of passengers and workers
- There are two types, flat and inclined, which can be used for various purposes and bag types.

## Features

- The sheet shape and frame structure were designed with passengers' and workers' safety in mind.
- The world's first friction drive system allows for low noise levels to be achieved.
- The floor pit and easily adjustable structure of take-up make installation easy.

## Applications

- Inside the passenger terminal building, and inside the restricted airport area

## Past Installations

- Japan: Haneda Airport, Narita Airport, Chubu Airport
- Overseas: (Thailand) Krabi Airport, Phuket Airport, Don Muang Airport, (Malaysia) Kuala Lumpur Airport, other facilities



Made in TKK



Perfect Conditions

Made by a foreign Company



Visible Deterioration



Durability Test for Wheels

Made in TKK



Perfect Conditions

Made by a foreign Company



Cracks, Peeling are visible

Uses highly durable parts

## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>





# 1-16. Hinged Diverter



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

## Product Summary

- The hinged conveyor is a belt conveyor type that allows for vertical diverting without impacting baggage.

## Features

- Sorting capacity up to 2,400 bags / hour
- Can be reversed and used as a merging device

## Applications

- Within the airport restricted area

## Past Installations

- Japan: Haneda Airport, Narita Airport, Chubu Airport, New Chitose Airport, other facilities.
- Overseas: (Malaysia) Kuala Lumpur Airport



## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>



# 1-17. Horizontal Sliding Belt Diverter



Category	Area	Baggage Handling
	Theme	Improving passenger convenience

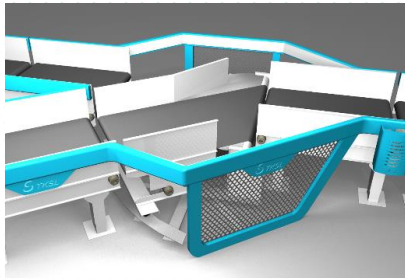
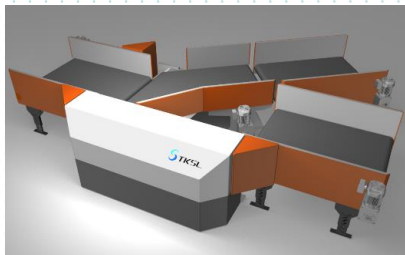
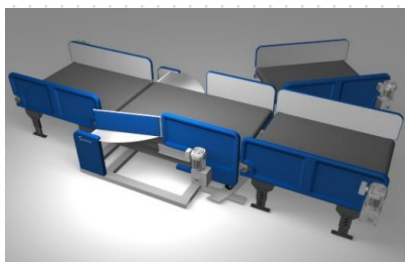
## Product Summary

## Features

## Applications

## Past Installations

- World's only provider of this solution with the most installations. (International patent).
- The belt diverter is a type of belt conveyor that allows for horizontal diverting without impacting baggage.
- Since no impact is imparted to baggage, the belt diverter is ideal as an inline screening diverter (airport explosive detection systems).
- Since the diverter is level with upstream conveyor and has no gaps, baggage loading is smooth and continuous for safe, high-performance sorting.
- Sorting capacity up to 2400-3600 bags/hour
- Can accommodate various shapes of baggage
- Our special belt guide to prevent slippage makes replacement easy.
- Within the airport restricted area
- Japan: Haneda Airport, Chubu Airport, Kansai Airport, New Chitose Airport, Fukuoka Airport, other facilities.
- Overseas: (Thailand) Trang Airport, (Malaysia) Kuala Lumpur Airport etc...



## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>



# 1-18. WHILL Autonomous service



Category	Area	Passenger Handling, Terminal Facilities
	Theme	Improving passenger convenience

## Product Summary

### A new transportation solution featuring autonomous driving technology

## Features

## Applications

## Past Installations

- Provides self-driving mobility and management systems for facility operators
- Through route customization tailored to the facility environment and customer needs, we enhance the smoothness of customer movement within the facility, achieving both service improvement and operational optimization simultaneously.
- Fully autonomous driving. No actions by the passenger are required while in motion.
- Detects when passengers get off the device and automatically returns to its original location.
- Easy and simple to use interface that can be operated by anyone
- Multilingual support
- Provides a remote fleet management system
- No additional infrastructure installation or communication devices are required within facilities.
- Elevator linkage possible
- transportation within and between airport terminals
- Optimization of PRM services
- Japan : Haneda, Narita, Kansai airports
- Overseas : Canada, Winnipeg airport



## Contact Information

- IMURA, Sharing Solution Dep.  
WHILL, Inc.  
TEL: +81-3-6718-4006  
E-mail: [jp.ss-sales@whill.inc](mailto:jp.ss-sales@whill.inc)  
URL: <https://whill.inc>
- Japan Airport Terminal Co.,Ltd  
Business Promotion Office (Sales Agent)  
TEL: +81-3-5757-8181  
E-mail: [eigyuu-suishin@jat-co.com](mailto:eigyuu-suishin@jat-co.com)





# 1-19. UVC sterilization Device



Category	Area	Terminal Facilities
	Theme	Others

## Product Summary

- The device for sterilizing baggage, luggage carts, and luggage trays through irradiation with ultraviolet rays of 3 millijoule.
- Irradiation with ultraviolet rays of 3 millijoule results in 99.9% sterilization.
- Through an evaluation test, a COVID-19 inactivating effect of 99.9% or more has been confirmed.
- 10 luggage carts can be sterilized in 30 seconds.



Carts, Wheelchairs, sterilizer



Luggage sterilizer inside the BHS

## Features

- Together with electric tags and QR codes, traceability management that allows users to grasp sterilization time and scheduled time for arrival of baggage is possible.
- Can be installed in various locations for multiple purposes, such as for luggage carts, BHS, security trays, etc.



Sterilizer of the trays for security check



Irradiation with ultraviolet rays

## Applications

- Inside passenger terminal buildings (e.g., concourses, security gates, and restricted areas)

## Past Installations

- Japanese Airports:
  - Chubu (1st Demo: OCT to NOV 2020)  
(2nd Demo: MAR to JUL 2021)
  - Kansai (AUG 2022)

## Contact Information

AGP CORPORATION  
TEL: +81 3 3747 1640;  
E-mail: [h.koyama@agpgroup.co.jp](mailto:h.koyama@agpgroup.co.jp)  
[y.tsuji@agpgroup.co.jp](mailto:y.tsuji@agpgroup.co.jp)  
URL: <https://www.agpgroup.co.jp>



## 2. Data

# 2-1. 3D BHS Monitoring System



Category	Area	Data Management Systems and Solutions
	Theme	Advanced and high quality of maintenance

## Product Summary

- Baggage can be monitored in real time, enabling the operator to respond quickly in the unlikely event of an incident.

## Features

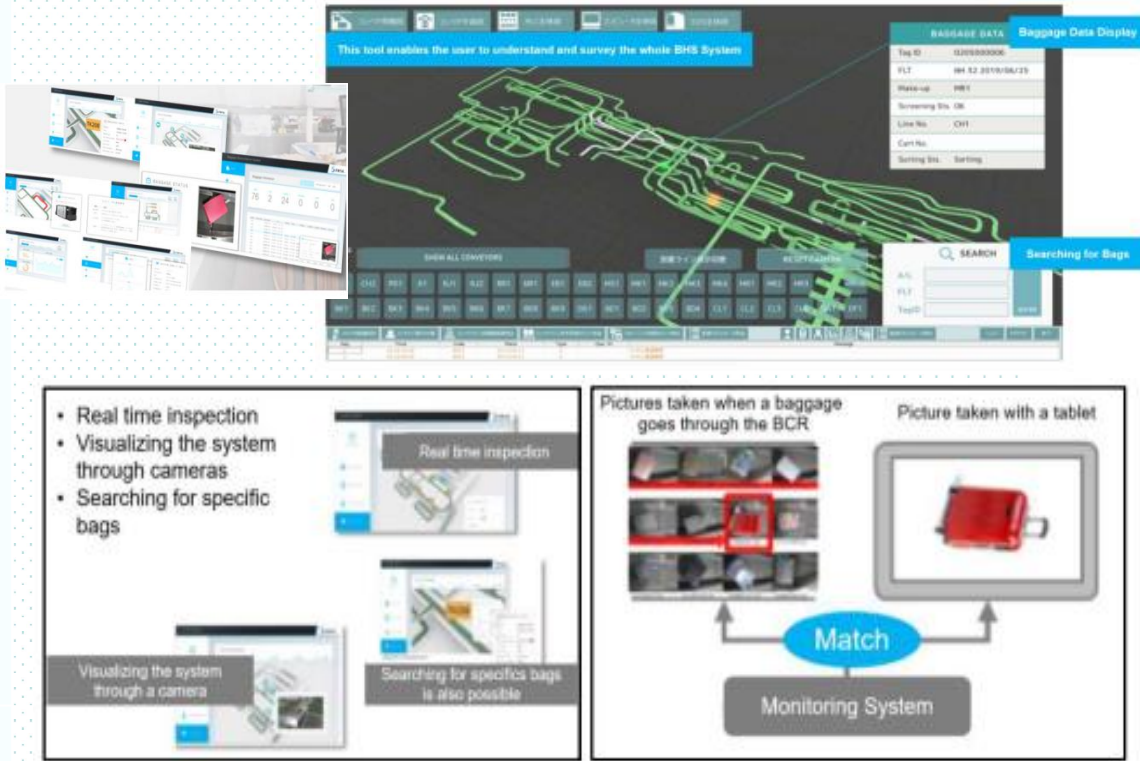
- Baggage being transported on the conveyor can be monitored in real time via a 3D image on the screen.
- Transport conditions based on BHS performance and flight status are centrally managed, ensuring better flight on-time performance.
- By utilizing AI technology, baggage that is inappropriate for the system can be identified for removal from the system, improving utilization rate.

## Applications

- Within the airport restricted area

## Past Installations

- Japan: Inside Haneda Airport, Inside Narita Airport



## Contact Information

Toyo Kanetsu K.K.  
Overseas Sales Group  
Logistics Solutions Sales Dept  
TEL: +81-3-5857-3132  
URL: <https://www.tksl.co.jp>



# 2-2. BHS Maintenance System



Category	Area	Infrastructure and Terminal Management
	Theme	Advanced and high quality of maintenance

Product Summary
Features
Applications
Past Installations

- By combining our in-house developed high-performance IoT sensors and AI, we have created a predictive maintenance system that identifies abnormalities in advance, improving reliability and reducing maintenance costs.
- By identifying trouble before it occurs, we support 24/7 non-stop airport operations
- The maintenance system can be remote with the use of a wearable camera to save cost and time.
- AI analyzes minute changes in vibration during operation to detect signs of failure and will also send out alerts.
- Parts can then be scheduled for replacement at the optimal time.
- Highly specialized technicians monitor data and images remotely and from multiple locations, delivering robust, high-quality maintenance support.
- Within the airport restricted area

Hinged Diverter

Vibration Sensor

**Data Analysis**

Data collection  
Machine learning  
Analysis results  
Decision Making

**Preventive Maintenance**

Maintenance Adjustments  
Parts Replacement

**Failure Prediction**

Using IoT, TKK's service center informs users of any potential failure, resulting in increased system reliability.

Butsuryu is an expert in predicting system failure.

**How it works**

Our AI analyses variable data and sends an alarm before a system failure takes place

Logistics Center

Meet our small-sized IoT center

Prediction and Security System

Security System Failure Alarm

Preventive Maintenance

Security System Failure Alarm

TKSL Service Center

Contact

User

BHS SCADA

PARTS MANAGEMENT

wireless

Diagnostic Device for Baggage Type

## Contact Information

Toyo Kanetsu K.K.  
 Overseas Sales Group  
 Logistics Solutions Sales Dept  
 TEL: +81-3-5857-3132  
 URL: <https://www.tksl.co.jp>





# 2-3. Aircraft Noise Monitoring



Category	Area	Data Management Systems and Solutions
	Theme	Countermeasures against Aircraft noise

## Product Summary

- Aircraft noise data obtained from noise measurement terminals and flight tracking information can be managed together.
- The evaluation of noise exposure situation around airports throughout the year will be beneficial for environmental assessment and countermeasures against aircraft noise.
- Flight tracking information can also be useful to consider flight times and flight routes.

## Features

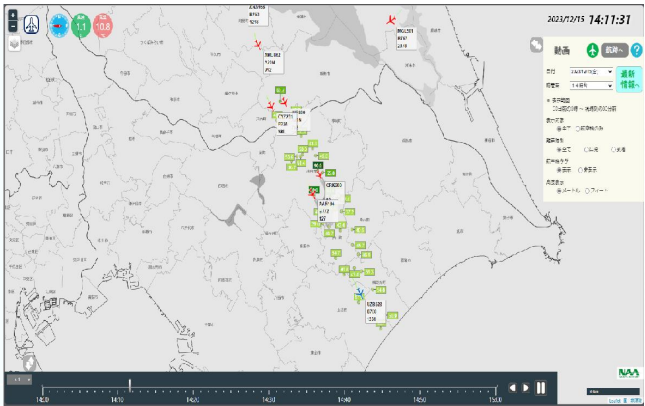
- Acquire aircraft noise report with accurate aircraft type.
- Acquire flight tracking of non-ADSB type with unique technology of sound arrival direction data.
- Special microphone with excellent weather resistance, allowing accurate measurements even in the rainy and humid Asian climate.

## Applications

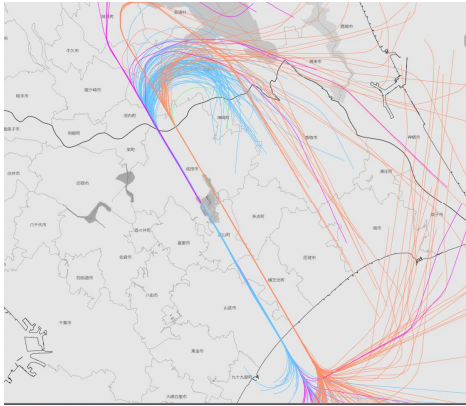
- Near airport runways
- Vicinity around the airport

## Past Installations

- Japan : Narita International Airport, National aviation facilities, etc.
- Overseas : Noi Bai International Airport, Dubai International Airport, etc.



Noise data



Flight tracking information



Measurement microphone



Technical training for local engineers

## Contact Information

Kazu Hagiwara, Int'l Sales Dept  
RION CO.,LTD.  
TEL: +81-42-359-7888  
E-mail: [hagiwara-y@rion.co.jp](mailto:hagiwara-y@rion.co.jp)  
URL: <https://rion-sv.com>





# 2-4. PANADES



Category	Area	Air Traffic Management
	Theme	Improving air traffic efficiency

## Product Summary

- PANADES is an integrated software package for Flight Procedure Design compliant to international standards (ICAO PANS OPS Criteria).
- It has a capability of automatically processing many of the complex calculations in flight procedure design work and features the ability to automatically create flight zones with as few parameter inputs as possible.
- This enables flight system designers to reduce their work time, ensure the quality and reliability of design results, and improve the safety of flight paths

## Features

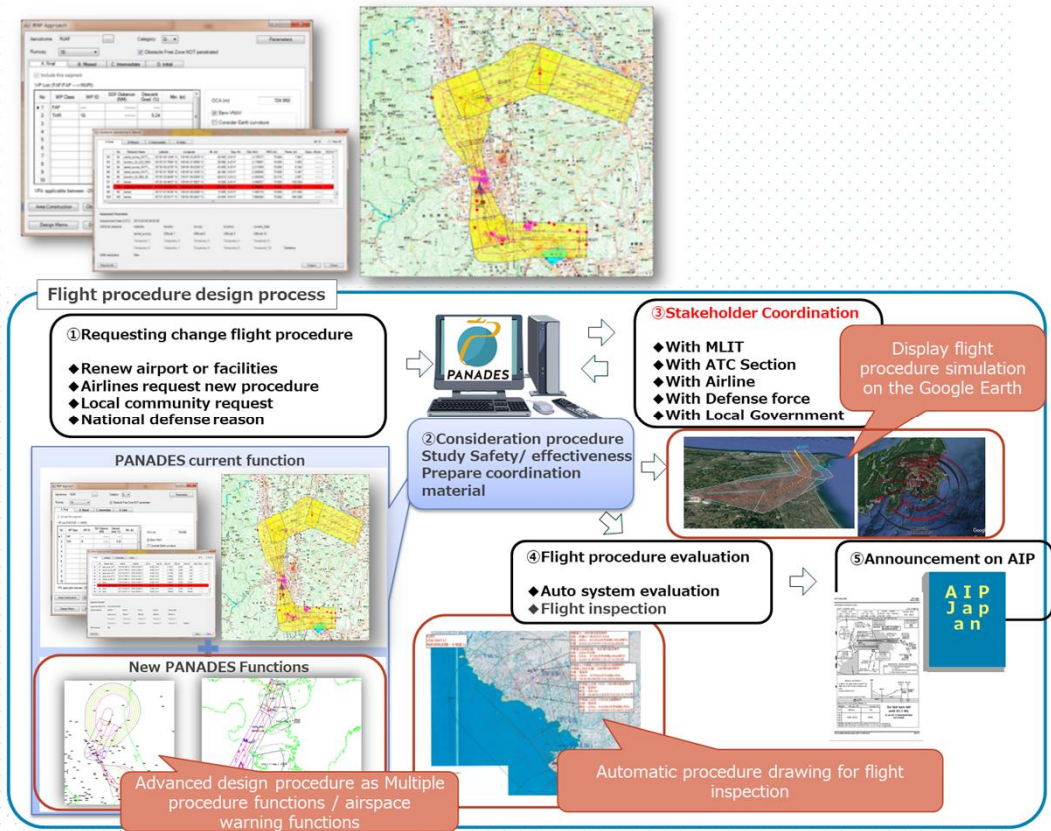
- **(1) Labor saving in operations**
- Realization of a high degree of automation in area drawing and obstacle safety verification
- Realization of quick and rational operation by allowing completion of designing work in a single screen
- Display of additional information used in the operation (intersection coordinates of the area, orientation, etc.)
- **(2) Ensuring the quality and reliability of design**
- Realization of a consistent quality flight rule regardless of designer while complying with ICAO standards
- **(3) Smooth integration with ATM systems**

## Applications

- Civil aviation authority and air traffic control providers
- Airport, etc.

## Past Installations

- Japan : MILT JCAB, MOD
- Overseas : (Thailand): Air traffic control provider AEROTHAI,  
(Indonesia): Directorate General of Civil Aviation,  
(Cambodia): Air traffic control provider CATS,  
(Nepal): Civil Aviation Authority of Nepal



## Contact Information

NTT DATA JAPAN Corporation  
First Public Sector, Mobility&Resilience Division  
TEL: +81 50 5546 2287  
E-mail: [info@airpalette.net](mailto:info@airpalette.net)  
URL: <https://www.airpalette.net/panades>



# 2-5. ACTS

(Aerodrome Control Training System)



Category	Area	Air Traffic Management
	Theme	Security and Safety

## Product Summary

- TAPS(※1), which is manufactured by Mitsubishi Electric Corporation, supports ATC services for aerodrome and terminal airspaces throughout Japan.
- ※1)TAPS : Trajectorized Airport traffic data Processing System
- ACTS is a simulator for training in aerodrome control using TAPS. This product offers not only the ATC equipment, but also virtual images of outside view and aircrafts seen from the control tower.

## Features

- The same equipment as actual TAPS are used. In addition, 340-degree screen displays clear and high presence out-the-window view.
- Customization of training scenario is available in various aspects such as aircrafts movement, weather, time of a day, etc.
- You can review the training with recorded operations and voice communication.

## Applications

- Airport offices

## Past Installations

- Japan : Tokyo international airport, Narita international airport, Naha airport



Training scene



Installation illustration

## Contact Information

Mitsubishi Electric Corporation  
 Government and public systems Dept. Sect.1  
 TEL: +81-3-3218-3204  
 E-Mail: [kankou2.global@nm.MitsubishiElectric.co.jp](mailto:kankou2.global@nm.MitsubishiElectric.co.jp)



## **3. Ramp**

# 3-1. Air to Ground Radio



Category	Area	Technical Installations
	Theme	Improving air traffic efficiency

## Product Summary

- It provides a system used for communication with aircraft by HF band radio communication. It can provide control information for aircraft flying over the ocean.

## Features

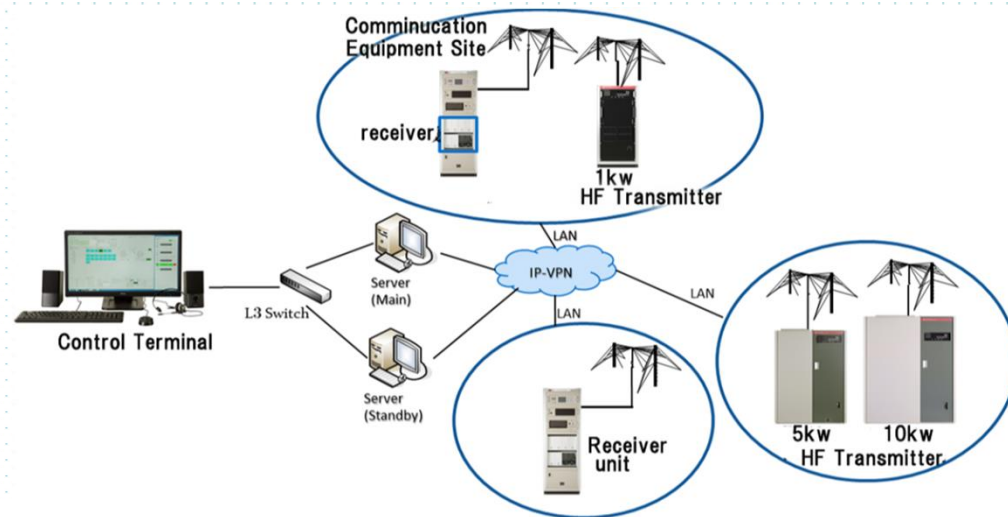
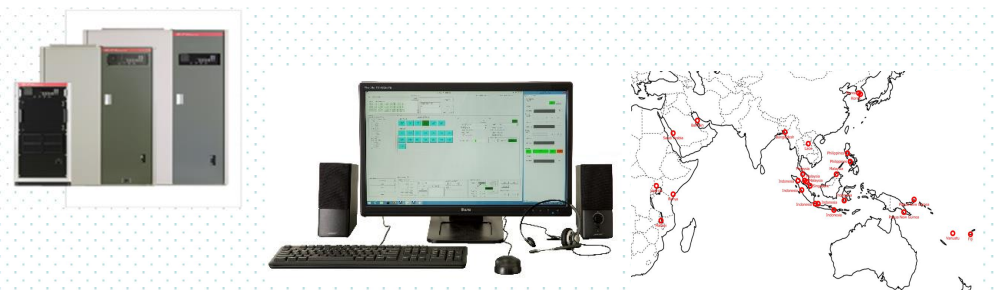
- The transmitter is fully solid-state type and can ensure long life cycle and low running cost.
- It can receive multiple signals of up to four channels.
- It has a module type of radio unit for easy maintenance.
- Compliant with ITU-R recommendations and ICAO standards

## Applications

- Control tower
- Remote type of air-ground communication equipment

## Past Installations

- Overseas Airport:(Singapore) Changi  
For the Civil Aviation Authority of Singapore
- Delivered to other airports around the world for more than 30 years



## Contact Information

Japan Radio Co., Ltd.  
TEL: +81 3 6832 0155  
URL: <http://www.jrc.co.jp>





# 3-2. Multilateration



Category	Area	Technical Installations
	Theme	Improving air traffic efficiency

## Product Summary

- A multilateration system (MLAT) is a secondary radar system that monitors the position of aircraft on an airport surface.
- JRC's MLAT achieves the world's highest level of positioning accuracy. In an evaluation at an actual airport, the system achieved a positioning accuracy error of 3 meters or less on the runway, compared to the standard of 12 meters or less (ED-117A).

## Features

- High positioning accuracy can be obtained with a minimized number of receiving stations.
- Since the system does not need power supply and LAN cable in outdoors, it can reduce damage from lightning, typhoons, and water damage.
- It can also monitor aircraft up to 30 NM around the airport.

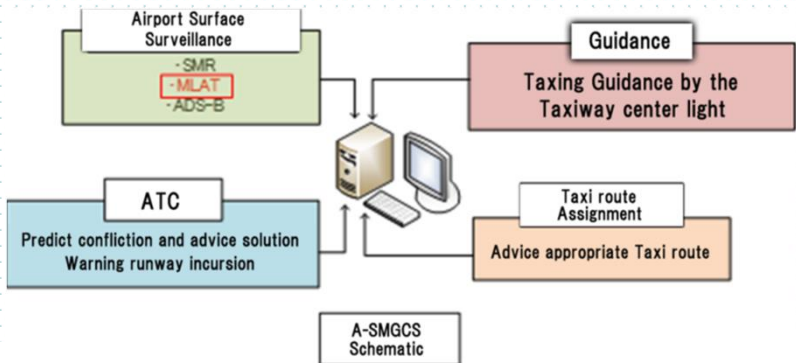
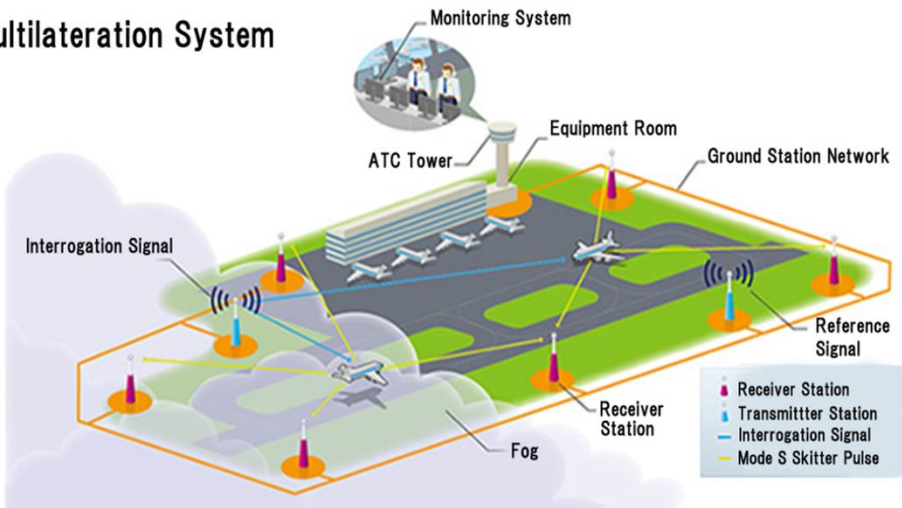
## Applications

- Runway in the airport restricted area

## Past Installations

- Japan : Fukuoka
- Overseas : (Vietnam) Phu Quoc

Multilateration System



## Contact Information

Japan Radio Co., Ltd.  
TEL: +81 3 6832 0155  
URL: <http://www.jrc.co.jp>



# 3-3. ASR/SSR Airport Traffic Control Radar



Category	Area	Technical Systems and Services(airside)
	Theme	Improving air traffic efficiency

## Product Summary

- An air traffic control radar system that uses the latest technology to provide stable and clear radar information to air traffic controllers in enroute and approach control airspace.

## Features

- Compliant with international standard ICAO Annex 10 SARPs
- Mode S ELS/EHS, Mix mode compatible
- High stability and reliability with all-solid-state transmitter and signal processing technology

## Applications

- Within airport restricted area
- Areas with good visibility such as mountain peaks (for enroute)

## Past Installations

- Japan : More than 30 airports
- Overseas : South Korea, Taiwan, Nepal, Bangladesh, Malawi, etc.



## Contact Information

Ae Uchikura  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
URL: <https://www.nec.com>

# 3-4. TRCS (Transportable Radar Control System)



Category	Area	Technical Systems and Services(airside)
	Theme	Disaster management, Improving air traffic efficiency

## Product Summary

- NEC's Transportable Radar Control System (TRCS) provides an essential radar air traffic control service at an airport where its ATC system is inoperative due to unexpected accidents and/or disasters or its equipment upgrade work.
- TRCS consists of PSR/SSR, ARTS, and VCCS.

## Features

- Compliant with international standard ICAO Annex 10 SARPs
- Maximum detection range of 60NM for PSR, 200NM for SSR
- Highly mobile system
  - Transportable by a medium size truck, aircraft or helicopter.
  - Can be set up within 90 minutes

## Applications

- Airport
- Temporary area of Landing/Take-off in case of Disaster

## Past Installations

- Japan : JCAB and MoD
- Overseas : None



Radar shelter



Control shelter



## Contact Information

Ae Uchikura  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
URL: <https://www.nec.com>



# 3-5. EVA

(Emergency VFR System for Air Traffic Control System)



Category	Area	Technical Systems and Services(airside)
	Theme	Disaster management

## Product Summary

- EVA serves as an alternative to air traffic control system in case a latter system fails because of contingencies
- EVA can be transported by air or land in case of emergency, the EVA consists of the commutation shelter, the control shelter, and the power supply shelter

## Features

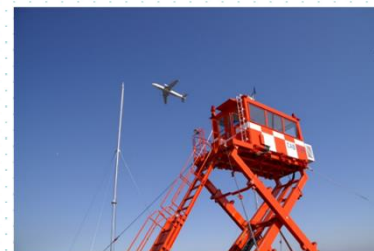
- The control shelter is equipped with the lifter that extends up to six meters, and the power shelter has a generator in case of emergency
- It has an earthquake-proof device
- Transport (by land, sea, or air) is possible

## Applications

- Various airports (international and regional)

## Past Installations

- Japanese Airports:
  - Sendai (at the time of the Great East Japan Earthquake in 2011)
  - Haneda, Osaka, Fukuoka(Stationed at Airport)



→Interior view



## Contact Information

MEISEI ELECTRIC CO., Ltd.  
 Meteorological & Disaster Prevention  
 Systems Div. Sales & Marketing Dept.  
 TEL: +81 3 6204 8254  
 E-mail: [websales@meisei.co.jp](mailto:websales@meisei.co.jp)





# 3-6. SAC-20(Transportable VCCS)



Category	Area	Technical Systems and Services(airside)
	Theme	Disaster management

## Product Summary

- This is the transportable voice communication control system console-for emergency use.
- The system consists of the air-to-ground radio communication console, the dedicated telephone console, the switch box for external interfaces (wireless lines, telephone lines), and the switch box (control unit, power supply unit) that controls the system.

## Features

- It can be carried in the dedicated storage case for easy deployment.
- The operation terminal device is a touch panel, which can be customized by user settings.
- A maximum of two air-to-ground communication consoles can be added.
- It can be battery powered in case of power failure.

## Applications

- Various airports and heliports

## Past Installations

- Japanese Airports:  
Haneda, Osaka (Stationed at Airport)



## Contact Information

MEISEI ELECTRIC CO., Ltd.  
Meteorological & Disaster Prevention  
Systems Div. Sales & Marketing Dept.  
TEL: +81 3 6204 8254  
E-mail: [websales@meisei.co.jp](mailto:websales@meisei.co.jp)



# 3-7. FOD Detection System



Category	Area	Technical Systems and Services(airside)
	Theme	Security and Safety

## Product Summary

- Millimeter wave radar and high-definition cameras constantly monitor runway safety
- Location information of foreign objects detected by radar is instantly transmitted to a high-definition camera, which can capture the object's image.
- The location information and camera images of the foreign object are notified to the airport operator, enabling rapid retrieval of the object if necessary.

## Features

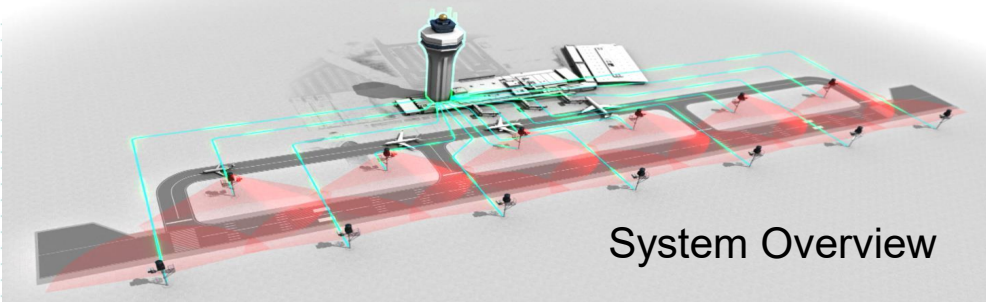
- Capable of detecting 1-inch diameter and 1-inch high metal cylinders (-20dBsm) at a 500m distance
- Confirmed to detect objects specified in EuroCAE MASPS (ED-235) with a detection rate of over 95% in clear weather
- One recommendation and one report have been approved and issued by ITU-R
- Minimizes risk of foreign object occurrence up to pilot report and equipment dropout report from hangar maintenance

## Applications

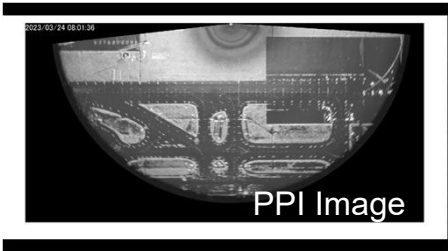
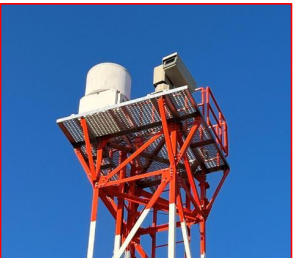
- Runway・Taxiway

## Past Installations

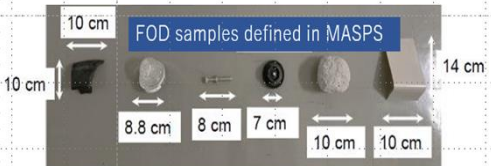
- Japan : Tokyo International Airport
- Overseas : Kuala Lumpur International Airport (KLIA)



System Overview



PPI Image



Hitachi Kokusai Electric

## Contact Information

Public Solution Sales Department,  
Hitachi Kokusai Electric Ltd.  
URL: <https://global.all.hitachi-kokusai.com>

# 3-8. CERA-DUCT GLOBAL



Category	Area	Airfield Lighting
	Theme	Advanced and high quality of maintenance, Decarbonation

## Product Summary

- Ceramic underground duct system
- Compactly accommodates multiple cables
- No change in shape and quality, can be used for long-term (has been used for over than 60 years continuously in Japan)
- The only product in Japan and in the world

## Features

- Improve of the cost performance and workability due to the compact cross section
- Reduce the labor and cost for the excavation and backfilling. No need for reinforcement so backfilling can be done right after the installation
- Contributing to sustainable society with outstanding life cycle cost. Made of ceramic, no deterioration. No need for duct renewal

## Applications

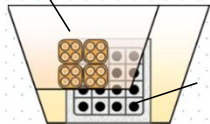
- Airport : runaway/apron/GSE passage way/green area & others
- Others : Container Yard/Power Plant & others

## Past Installations

- Japan : Narita & 29 other airports
- Overseas : Singapore, Bangladesh, Papua New Guinea, Taiwan



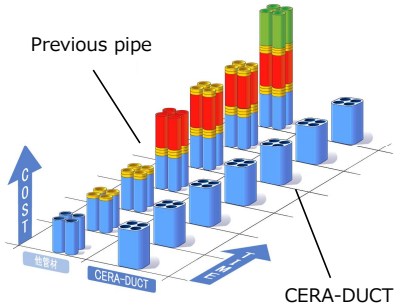
CERA-DUCT GLOBAL  
CERA-DUCT



uPVC pipe reinforced concrete



■ : Excavation ■ : Ground Leveling ■ : Duct Installation ■ : Backfilling



■ : Installation cost  
■ : Maintenance cost  
■ : Renewal cost

## Contact Information

Chatarina  
International Sales Div.  
Sugie Seito Co., Ltd.  
TEL: +81-569-35-2360  
E-mail: [ceraduct-a@sugie.co.jp](mailto:ceraduct-a@sugie.co.jp)  
URL: <https://www.sugie.co.jp>





### 3-9. Airport Pavement Inspection System



Category	Area	Pavement Servicing
	Theme	Advanced and high quality of maintenance

#### Product Summary

#### Features

#### Applicability

#### Past Installations

- This is the system that allows operators to make reports on inspection, repair, etc. uniformly via a smartphone app.
- This system contributes to considerable cost reduction for operation (e.g., communication and office work operations).
- Abnormalities, status photos, and location information in inspection sites can be reported with a smartphone app alone.
- Recorded data can be checked via personal computers in real time based on cloud management. Moreover, diagnoses and instructions for response actions can be conveyed remotely. Thus, this system reduce communication tasks.
- Accumulation of records of abnormalities allows analysis of data used for planning of preventive maintenance.
- Reports can be automatically output. Thus, this system contributes to reduce office works (e.g., creation of daily and monthly reports).
- Runway, taxiways, aprons, overrun areas, roads, parking spaces, etc.
- Japanese Airport: Nanki-Shirahama airport (Oriental Consultants Holdings, Company Limited)
- Others: Local governments

#### ■ Structural image



#### Contact Information

Research & Solution Co.,  
Ltd.Department, Corporation  
TOKYO sales Kakeru Aoki  
TEL: +81-3-6311-8356  
E-mail: [aoki-k@rands-co.com](mailto:aoki-k@rands-co.com)

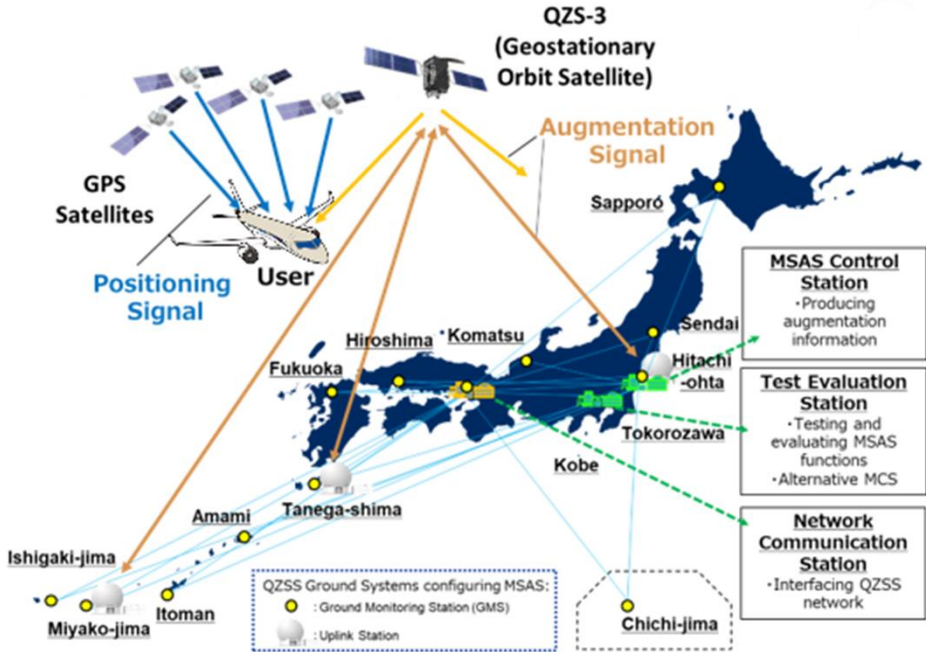


# 3-10. MSAS (Michibiki Satellite-based Augmentation Service)



Category	Area	Ground Support Equipment and Services
	Theme	Improving air traffic efficiency, Decarbonation

Product Summary	<ul style="list-style-type: none"> <li>■ A wide-area augmentation system that provides aircraft with advanced safety and highly accurate correction information for GPS</li> <li>■ It realizes secure and accurate GPS positioning.</li> </ul>
Features	<ul style="list-style-type: none"> <li>■ Compliant with international standard ICAO SARPs</li> <li>■ It uses the quasi-zenith satellite system Michibiki 3 (QZS-3 geostationary satellite).</li> <li>■ It can expand the coverage area by adding monitoring stations (optional function).</li> </ul>
Applications	<ul style="list-style-type: none"> <li>■ Master control station (MCS): Hitachiota, Ibaraki prefecture</li> <li>■ Ground monitor stations (GMS): throughout Japan (airports, etc.)</li> <li>■ Optical circuit</li> </ul>
Past Installations	<p>Japan : Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism</p>



## Contact Information

Erika Koshino  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [e-koshino@nec.com](mailto:e-koshino@nec.com)  
URL: <https://www.nec.com>

# 3-11. GBAS ( Ground-Based Augmentation System )



Category	Area	Ground Support Equipment and Services
	Theme	Improving air traffic efficiency, Decarbonation, Countermeasures against Aircraft noise

## Product Summary

- A landing guidance system to assist aircraft approach and landing using GPS technology

## Features

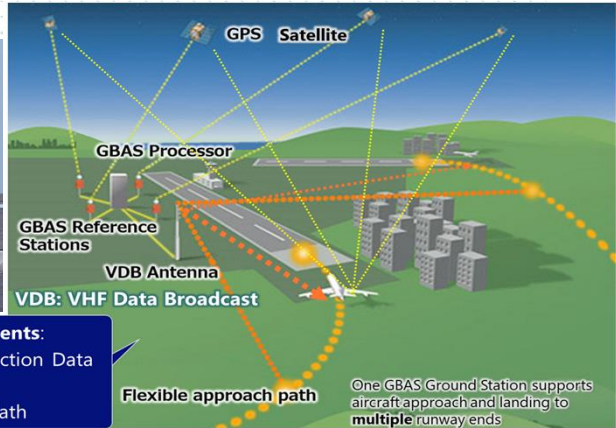
- Compliant with international standard ICAO SARPs
- Challenge of GBAS in low magnetic latitude environments with the introduction of IFM (Ionospheric Field Monitor)
- Benefits of GBAS
  - Lower installation and operation costs (Supporting aircrafts approach for multiple runways and bidirectional)
  - Flexible approach and landing methods can be selected

## Applications

- Installed in and near airports

## Past Installations

- Japan : Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism



- GBAS Message Contents:**
- ✓ Differential Correction Data
  - ✓ Integrity Data
  - ✓ Final Approach Path

## Contact Information

Erika Koshino  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [e-koshino@nec.com](mailto:e-koshino@nec.com)  
URL: <https://www.nec.com>



# 3-12. Ground movement type GPU/PCA



Category	Area	Ground Support Equipment and Services
	Theme	Improving air traffic efficiency, Decarbonation

## Product Summary

- GPU/PCA for supplying electricity and air-conditioning air to a parked aircraft.
- This method distributes the power cables/air conditioner hoses from GPU/PCA near aprons using arms with wheels.
- CO2 emissions are 1/10 of those of APU (Auxiliary Power Unit)

## Features

- Large-size construction work for aprons is unnecessary.
- Vehicles for supplying electricity/air conditioner air are unnecessary.
- Development and containment of cables/hoses are smooth.
- It is possible to flexibly respond to aircraft parking positions.

## Applications

- Aprons

## Past Installations

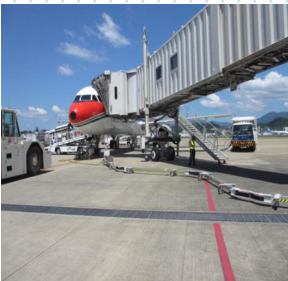
- Japanese Airports : Haneda, Narita, Kobe, Fukuoka



Electric cable container



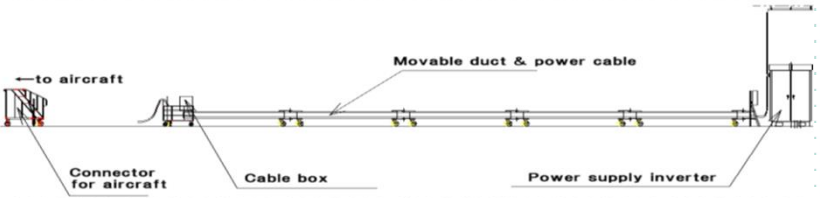
Electricity supply



Electricity supply



Electricity/air conditioner integrated type



## Contact Information

AGP CORPORATION  
TEL: +81 3 3747 1640;  
E-mail: [h.koyama@agpgroup.co.jp](mailto:h.koyama@agpgroup.co.jp)  
[y.tsuji@agpgroup.co.jp](mailto:y.tsuji@agpgroup.co.jp)  
URL: <https://www.agpgroup.co.jp>



# 3-13. Battery-powered GPU



Category	Area	Ground Support Equipment and Services
	Theme	Improving air traffic efficiency, Decarbonation

## Product Summary

- The GPU can help to the decarburization of airports.
- Static power converter inverter for aircraft.
- GPUs powered by lithium-ion batteries have significantly lower CO2 emissions and noise than GPUs powered by conventional diesel engines.
- Next-generation, environmentally friendly GPUs.
- First domestic production in Japan

## Features

- Based on AGP's accumulated aircraft power load data, a compact and lightweight lithium-ion battery with optimal capacity and excellent charge-discharge characteristics is used.
- The CHAdeMO fast charging standard for electric vehicles (BEVs) is used to control the charging of the lithium-ion batteries, allowing the use of fast chargers for BEVs and other benefits in terms of versatility and safety.
- Power assist for easy handling.

## Applications

- Aprons

## Past Installations

- Demonstration test underway from OCT 2022



Battery-powered GPU Dimensions L2,745 x W1,480 x H1,620mm Weight 2,200KG Less than



Front View



Back View



Side View

## Contact Information

AGP CORPORATION  
TEL: +81 3 3747 1640;  
E-mail: [h.koyama@agpgroup.co.jp](mailto:h.koyama@agpgroup.co.jp)  
[y.tsuji@agpgroup.co.jp](mailto:y.tsuji@agpgroup.co.jp)  
URL: <https://www.agpgroup.co.jp>



### 3-14. Fixed type GPU/PCA Underground System



Category	Area	Ground Support Equipment and Services
	Theme	Improving air traffic efficiency, Decarbonation

#### Product Summary

- GPU/PCA for supplying electricity and conditioned air to a parked aircraft
- In recent years, GPUs have been used in place of APUs to reduce CO2 emissions, and the Underground System is the most reasonable Japanese method.

#### Features

- CO2 emissions from GPUs are about 1/10 of those from APUs (ECOLOGICAL)
- No need for a supply vehicle, eliminating the risk of collision (SAFTY)
- Unlike mobile equipment, the time required for connection is short (WORKING EFFICIENCY)
- No loss of apron appearance due to underground burial (LANDSCAPING)
- Embedded pipes can be almost perpetually used (DURABILITY)
- Cooling effect is not easily affected by outside temperatures (THERMAL EFFICIENCY)

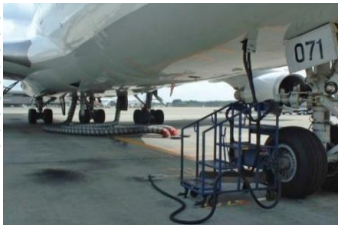
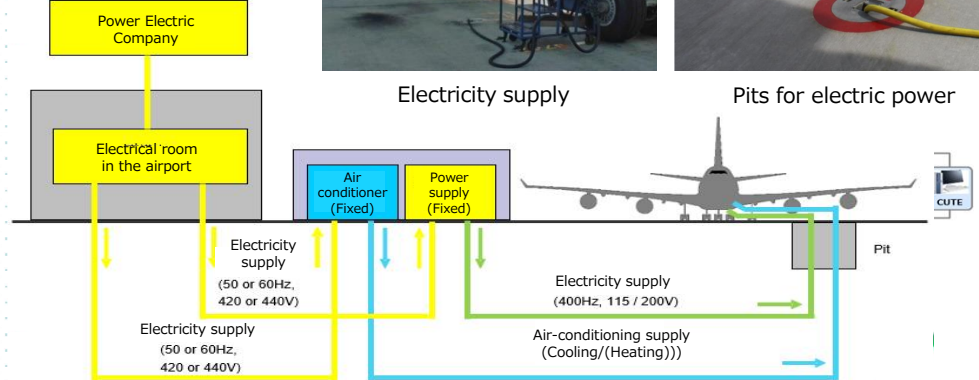
#### Applications

- Aprons

#### Past Installations

- Japanese Airports : New Chitose, Narita , Haneda, Chubu Centrair, Kansai etc. (600 units for nine airports)

Underground type GPU system  
Schematic diagram



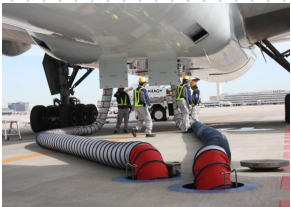
Electricity supply



Pits for electric power



Pits for air-conditioning air



Air-conditioning air supply

#### Contact Information

AGP CORPORATION  
TEL: +81 3 3747 1640;  
E-mail: [h.koyama@agpgroup.co.jp](mailto:h.koyama@agpgroup.co.jp)  
[y.tsuji@agpgroup.co.jp](mailto:y.tsuji@agpgroup.co.jp)  
URL: <https://www.agpgroup.co.jp>





# 3-15. Full Flat Floor Type PBB



Category	Area	Aircraft Docking and Passenger Boarding Bridges
	Theme	Improving Passenger Convenience

## Product Summary

- Full Flat Floor Type PBB (EASYWALK®) eliminates steps inside the PBB tunnel and allows passengers to pass through with ease.
- Full Flat Floor Type PBB is a product only one to Japan. Several Japanese PBB companies have commercialized this product, as the necessity to improve hospitality of airport buildings and airlines escalated, due to the increase in number of passengers falling in the aisles.

## Features

- Successfully achieved transforming steps in the passageways to a full-flat surface by using a unique floor mechanism. This has led to a reduction of falling accidents as well as reducing concerns of wheelchair users and easing workload of airport staff.
- Simple mechanical design achieved as the floor mechanism does not require any special control system to extend and retract the tunnel.

## Applications

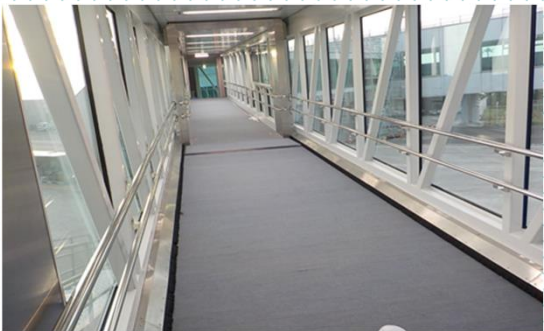
- Shipsides(Aprons)

## Past Installations

- Japan : 12 airports, Total 46units PBB  
(as of Dec.2023)  
Tokyo International airport(Haneda),  
Sendai airport and Other local airports



Full Flat Floor Type PBB Exterior View

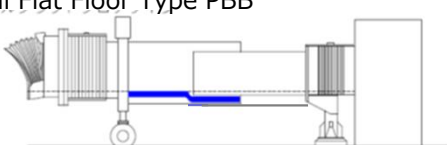


Full Flat Floor Type PBB Interior View

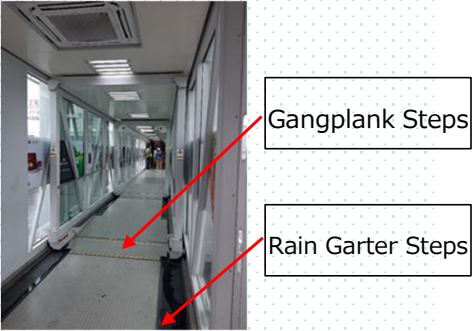
Standard Type PBB



Full Flat Floor Type PBB



Model Comparison



Steps Inside Standard PBB Tunnel

## Contact Information

ANA MOTOR SERVICE CO.,LTD.  
Airport Facilities & Equipment  
TEL: +81-3-5756-7607  
E-mail: [t.okada@anams.co.jp](mailto:t.okada@anams.co.jp)  
URL: <https://www.anams.co.jp/index.html>

# 3-16. PBR(Passenger Boarding Roof)



Category	Area	Aircraft Docking and Passenger Boarding Bridges
	Theme	Improving passenger convenience, Security and Safety

## Product Summary

- Passage with an extendable roof**
- Extendable part specification (one unit)
    - WGT: About 150 kg; H: 2,600 mm; W: 1,750 mm;
    - L: 1,250 mm -> 250 mm
    - Unit connection allows response to length in accordance with the operating environment.
  - Tip part specification
    - WGT: About 300 kg; H: 2,600 mm; W: 1,750 mm
    - It is possible to respond to changes in size, a boarding gate, or the like in accordance with the operating environment.

## Features

- Passenger routes can be established between the terminal and the aircraft even where there is no PBB.
- Can be extended, retracted, and moved by an electric towing vehicle or other means.
- The telescopic mechanism reduces the length to 1/5 of the maximum length when retracted.
- Several colors can be selected for the sealing and sides.

## Applications

- Aprons
- Ship CIQ facilities
- Event venues.

## Past Installations

- Japanese Airports:
  - Chubu (LCC terminal) OCT 2019, Matsumoto MAR 2024
- Japanese Ports:
  - Shizuoka Shimizu MAR 2021, Kyoto Maizuru JUL 2021
  - Ehime Matsuyama MAR 2024



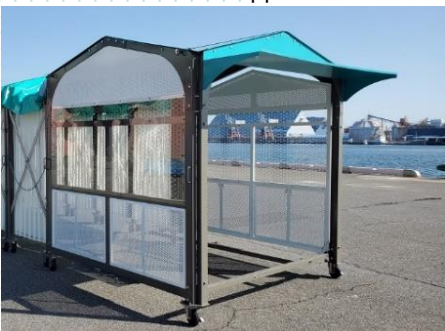
Inside PBR passage



PBR external appearance



Roof and side designs can be changed



Tip part

## Contact Information

AGP CORPORATION  
TEL: +81 3 3747 1640;  
E-mail: [h.koyama@agpgroup.co.jp](mailto:h.koyama@agpgroup.co.jp)  
[y.tsuji@agpgroup.co.jp](mailto:y.tsuji@agpgroup.co.jp)  
URL: <https://www.agpgroup.co.jp>



# 3-17. PBB(Passenger Boarding Bridge)



Category	Area	Aircraft Docking and Passenger Boarding Bridges
	Theme	Improving air traffic efficiency

## Product Summary

- Fully Automatic Docking System (Intelligent PAXWAY™)  
This system consists of 2 cameras, an image processor and a laser rangefinder, which incorporates artificial intelligence, detects aircraft doors regardless of aircraft parking errors and run automatically up to approx. 2cm ahead of the aircraft door with single push of a button.
- Remote Control  
Remote control is possible as an upgrade feature of the fully automatic docking system. This system allows the operator to drive 2nos PBBs simultaneously from an apron far from the CAB.

## Features

- Fully Automatic Docking System (Intelligent PAXWAY™)
  1. Prevents misoperation using AI and image recognition technology.
  2. Stable docking and undocking regardless of the skill level of the operator.
  3. Possible to reduce training time for PBB new operators.
- Remote Control  
This system enables remote operation of multiple PBBs from a control panel installed on the rotunda column of the PBB, reducing the workload of GSE works and saving manpower. In the future, this system can operate PBBs remotely at multiple Gates from the central monitoring room in the terminal building, reducing the number of operators assigned to each PBB.

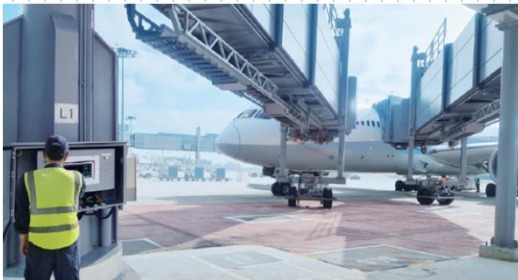
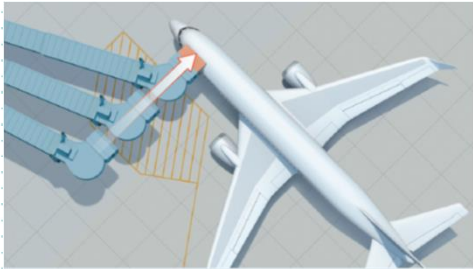
## Applications

- Apron

## Past Installations

- Fully Automatic Docking System (Intelligent PAXWAY™)  
Japan: Osaka (Itami) Airport  
Overseas: Changi Airport(Singapore)
- Remote Control  
Overseas: Changi Airport(Singapore)

- Fully Automatic Docking System (Intelligent PAXWAY™)  
Docking Procedure
  1. 1 Push “Auto Start”  
(No selection aircraft model required.)
  2. Detects the aircraft door and runs automatically, stopping 1m away.
  3. Again detects door image, automatically completed docking.  
(Gap is approx.2cm from fuselage, automatically lower canopy, enable the Auto-Level mode.



- Remote Control  
Achieving the world’s first “Autonomous fully remote control PBB” without the selection of aircraft model at Changi Airport and contributed to Smart Airport Operation.  
Executed actual aircraft docking test using door mock-up and retired B777 from Sep/2022 to Mar/2023.  
The live aircraft operation using remote control had started from Aug/2023.

## Contact Information

ShinMaywa Industries, Ltd.  
Parking Systems Div.  
TEL: +81-3-3843-3410  
E-mail: [hayashi.y1@shinmaywa.co.jp](mailto:hayashi.y1@shinmaywa.co.jp)  
URL: <https://www.shinmaywa.co.jp>





### 3-18. Monitoring Service by Synthetic Aperture Radar (SAR) Satellite

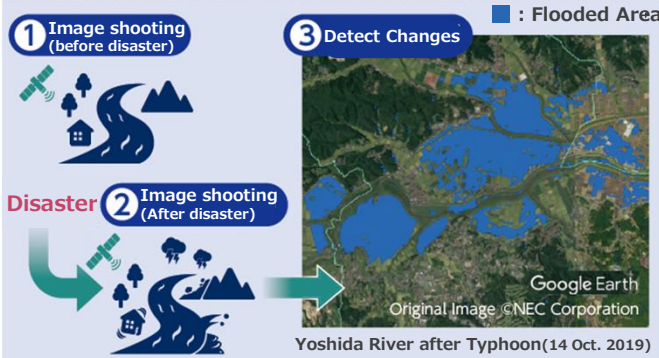


Category	Area	Airfield Service Equipment
	Theme	Advanced and high quality of maintenance

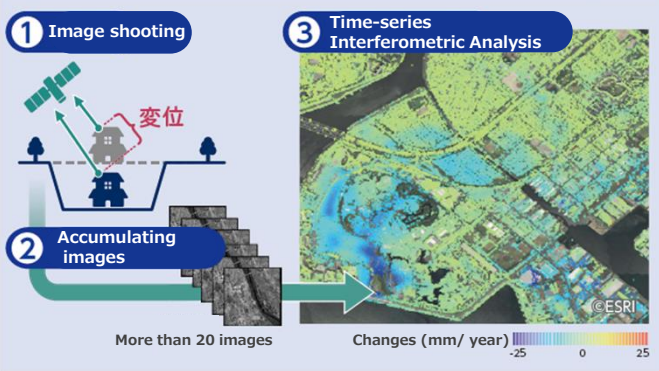
- Product Summary
- Features
- Applications
- Past Installations

- Change Detection Service
  - To detect changed areas by analyzing strength information of SAR images from two different periods.
- Time-series Interferometric Analysis Service
  - To detect very slight displacements of infrastructure or ground subsidence etc. by interferometric analysis of phase information of SAR images.
- Analysis unit is 4-8 km square
- Accuracy of displacement measurement is within 3-4mm /year
- Real time data analysis (image acquisition frequency: approx. 1-2 images/month)
- Resolution of satellite images is currently 1-3 m
- Airport / Runways
- Shield construction area
- Port facilities (Tanks, pipelines, etc.)
- Japan : Haneda Airport, Kansai Airport, Nanki-Shirahama Airport (PoC project) Shield construction area (In operation)
- Overseas : None

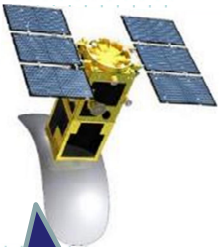
#### Change Detection Analysis Service



#### Time-series Interferometric Analysis Service



**ASNARO-2**  
(SAR satellite owned / operated by NEC)



NEC supports Satellite Operation, Sales and Analysis of images from ASNARO-2

#### Contact Information

Ae Uchikura  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
URL: <https://www.nec.com>

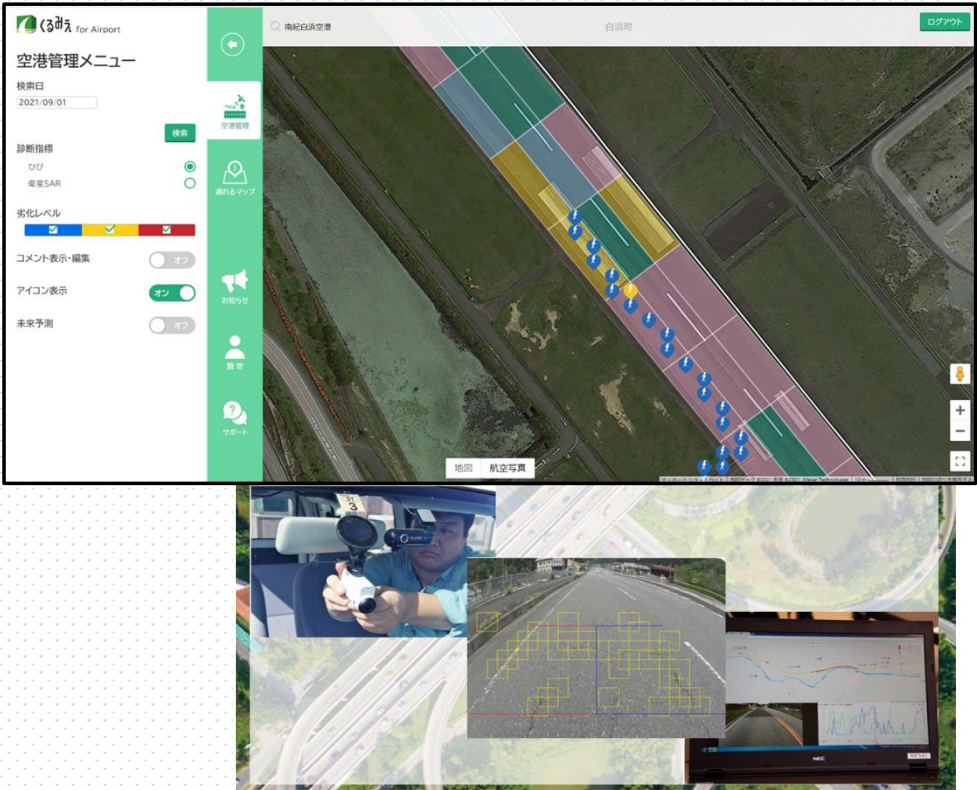
3-19. Road Pavement Damage Diagnosing System



Category	Area	Airfield Service Equipment
	Theme	Advanced and high quality of maintenance

Product Summary
Features
Applications
Past Installations

- By analyzing the video image of road surfaces taken from running cars, damage to roads, such as cracks and rutted roads, is checked.
- Inspection is possible at a low cost and over a short period of time.
- It is possible for the central government and local governments to make maintenance plans for higher-priority roads and efficiently conduct inspection activities.
- Roads
- Japan : Nanki-Shirahama Airport
- Overseas : None
- \*Individual consultations for overseas projects



Contact Information

Ae Uchikura  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
URL: <https://www.nec.com>

# 3-20. Optical Fiber Sensing



Category	Area	Security Services
	Theme	Security and Safety, Advanced and high quality of maintenance

## Product Summary

- Fiber sensing is a technology for detecting optical fiber vibrations in fences at important facilities, etc. and in ground and discovering behavior such as trespassing and lurking.

## Features

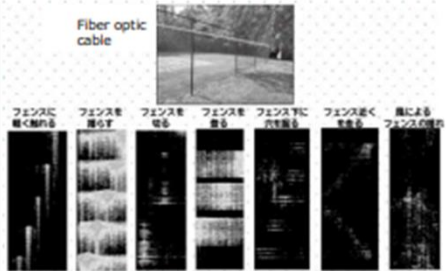
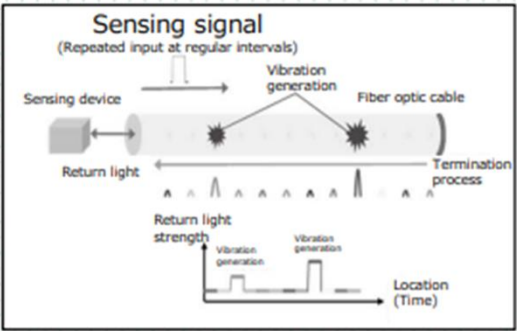
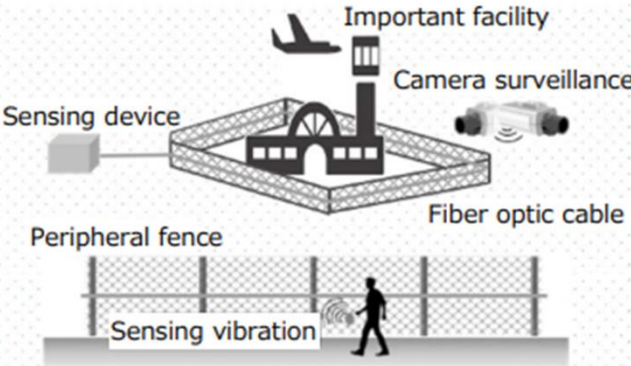
- A single optical fiber can cover a wide range of several kilometers to several tens of kilometers.
- Use of high spatial resolution and AI allows inhibition of erroneous warning and automatic event identification.
- High security linked with cameras can be Implemented

## Applications

- Perimeters for important facilities, such as airports and air traffic control facilities

## Past Installations

- Japan : Demonstration test in important facilities
- Overseas : Demonstration test in important facilities



## Contact Information

Ae Uchikura  
Land, Infrastructure, Transport and Tourism  
Solution Department, NEC Corporation  
TEL: +81-3-3798-6683  
E-mail: [uchikura\\_ae@nec.com](mailto:uchikura_ae@nec.com)  
URL: <https://www.nec.com>



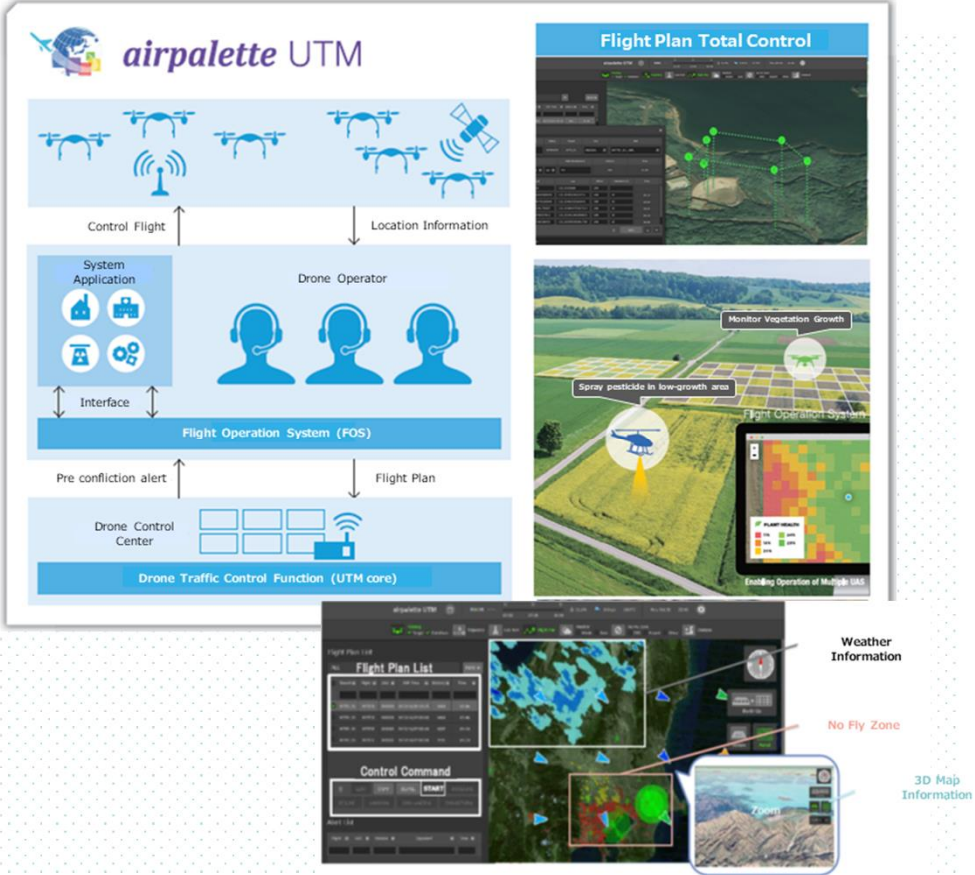
# 3-21. airpalette UTM



Category	Area	Unmanned Vehicles(UV)and Cargo Drones
	Theme	Advanced and high quality of maintenance

Product Summary
Features
Applications
Past Installations

- airpalette UTM has a flight management function that sets flight routes and conducts automatic remote control and a traffic management function that avoids collisions between aircrafts and monitors intrusion into prohibited airspace, thereby ensuring safe drone operations.
- Creation of simple flight plans: It creates a flight plan with various factors such as no-fly zone and weather conditions taken into consideration.
- Simultaneous flight of multiple drones: It improves work efficiency by setting a wide range of flight ranges for multiple drones.
- High security: Cloud/on-premise data storage management to match the demands of customers
- Disaster response (assessment of disaster situation)
- Infrastructure inspection (electricity, telecommunications, etc.)
- Japan: Local government, Electric utilities



## Contact Information

NTT DATA JAPAN Corporation  
First Public Sector, Mobility&Resilience Division  
TEL: +81 50 5546 2287  
E-mail: [info@airpalette.net](mailto:info@airpalette.net)  
URL: <https://www.airpalette.net/utm>



**Revised Edition, January 2024**