News Release
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New Energy and Industrial Technology Development Organization (NEDO)
JAPAN RADIO CO., LTD.
NIPPON AVIONICS CO., LTD.
ACSL LTD.
MITSUBISHI RESEARCH INSTITUTE, INC.

International Standard ISO15964 Released
— NEDO Research and Development Results Contributed to System Standardization —

Translation of Japanese NEDO news release posted on May 8, 2025

Based on the results of NEDO's commissioned project "Robot and Drone Utilization for Creating an Energy-Efficient Society Project" (hereinafter referred to as the "NEDO DRESS Project"), Japan Radio Co., Ltd., Nippon Avionics Co., Ltd., ACSL Ltd., and Mitsubishi Research Institute, Inc. have been contributing to the standardization of detection and avoidance systems for uncrewed aircraft.

On April 25, 2025, the International Organization for Standardization (ISO) officially released the international standard for uncrewed aircraft detection and avoidance systems as "ISO15964 Detection and avoidance systems for uncrewed aircraft systems" (hereinafter referred to as "this standard"). This standard specifies the requirements for sensors and other components used in detection and avoidance systems that implement "ISO21384-3 Unmanned aircraft systems—Part 3: Operational procedures." Japan contributed use cases for detection and avoidance with manned helicopters, which were based on the technical report "ISO/TR 23267: Experiment results on test methods for detection and avoidance (DAA) systems for unmanned aircraft systems." This report compiled various demonstration experiment results from the NEDO DRESS Project.

Going forward, drone stakeholders who have independently developed detection and avoidance technologies, conducted operational demonstrations, and explored business opportunities can now align their efforts with this standard. This will accelerate global information sharing, technology development, and social implementation. The international standardization of detection and avoidance systems between uncrewed aircraft and other aircraft, or between uncrewed aircraft themselves, will harmonize technological development and accelerate implementation efforts across countries, leading to the realization of a wide range of services.

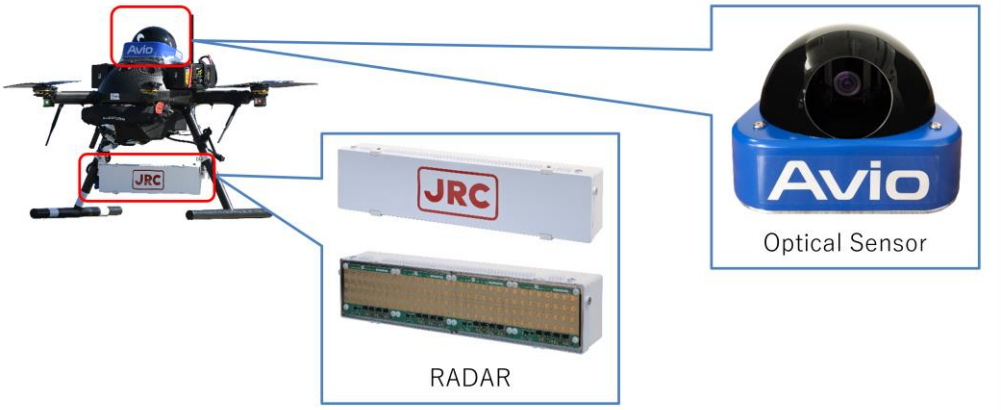

Figure 1: Examples of sensors developed in the NEDO DRESS Project

1. Background

Small to medium-sized uncrewed aircraft, commonly known as drones, are already widely used in the agricultural sector and are expected to play a significant role in transporting supplies during disasters, searching for missing persons, and logistics infrastructure. However, in Japan, there have been reports of near-misses[*1] between uncrewed aircraft and manned aircraft such as medical helicopters making detection and avoidance an urgent safety issue for uncrewed aircraft.

The NEDO DRESS Project[*2] began developing detection and avoidance technology for uncrewed aircraft in fiscal 2017 and carried out demonstration trials through fiscal 2021, resulting in multiple research and development outcomes related to detection and avoidance technology.

In October 2023, a detection and avoidance CONOPS (Concept of Operations) was added as a new chapter to "ISO 21384-3:2023 Unmanned aircraft systems Part 3: Operational procedures[*3]," based on these results and proposals from Japan. This new chapter outlines a basic six-step procedure for detection and avoidance. Furthermore, the technical report ISO/TR 23267[*4] was published on April 15, 2024.

2. Results of the NEDO DRESS Project

This standard, ISO 15964[*5], specifies the basic architecture of detection and avoidance systems that implement the basic six-step procedure defined in ISO 21384-3:2023. These steps are "Object detection," "Target recognition," "Avoidance maneuver," "Confirmation of avoidance results," "Return to original route," and "Flight on original route."

Furthermore, this standard is designed to support a range of applications, including short-range and medium- to long-range detection and avoidance systems. Japan incorporated responses to medium to long-range use cases assuming detection and avoidance with manned aircraft. Specifically, the standard defines the roles of various sensors and the detection/recognition distances for each of the six steps in the detection and avoidance CONOPS. These specifications apply to systems equipped with RADAR and optical sensors mounted on uncrewed aircraft.

Table 1: Hardware and software used in the six-step detection and avoidance process

Operational Procedures for Detection and Avoidance (ISO 21384-3:2023)		Detection and Avoidance Systems (ISO 15964)
Step	Operation	Hardware, Software
1	Object Detection	Target Detection RADAR
2	Target Identification	Drone Obstacle Recognition Optical System
3	Evasive Maneuver	Drone Detection and Avoidance Processing System
4	Verification of Evasive Action	Optical Sensor (Camera) for Avoidance Verification
5	Route Recovery	Drone Route Reacquisition Optical Sensor
6	Flight on Original Route	Recovery Processing Unit

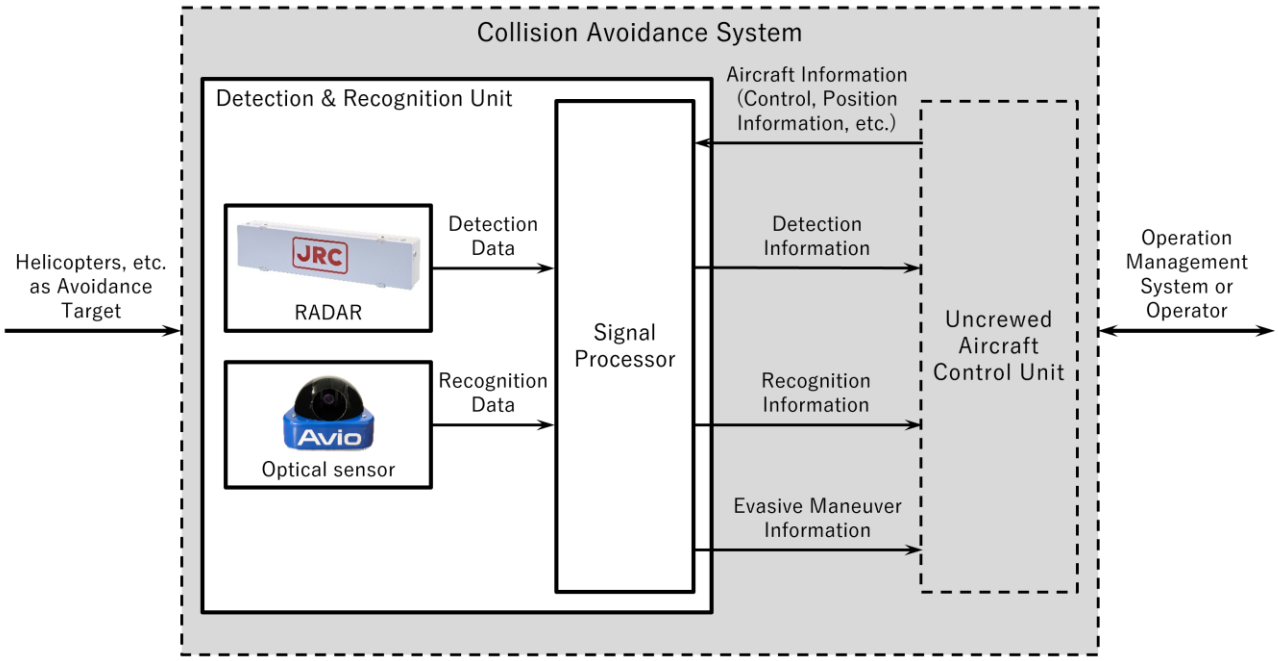

Figure 2: Basic architecture of medium to long-range detection and avoidance systems

The requirements for sensor roles and their detection and recognition distances are based on ISO/TR 23267. This technical report was proposed by Japan and compiled by Japan Radio Co., Ltd. and Mitsubishi Research Institute, Inc., from various demonstration trials, research and development outcomes from the NEDO DRESS Project.

Additionally, the standard specifies an architecture that relies solely on optical sensors for use cases

involving small, uncrewed aircraft that cannot carry RADAR. It defines the roles and detection/recognition distances of various sensor equipment in the six steps of detection and avoidance CONOPS based on the evidence in ISO/TR 23267.

Table 2: Reflection of NEDO DRESS Project results in ISO standards

Collision Avoidance Technology	**Unmanned aircraft systems Part 3: Operational procedures (ISO 21384-3：2023)**	● Document the fundamental process of detection and avoidance and the task performance in each process. ● The October 2023 revision incorporates insights from detection and avoidance technology developed in the NEDO DRESS project
	Experiment results on test methods for detection and avoidance (DAA) systems for unmanned aircraft systems (ISO/TR 23267:2024)	● A compilation of significant outcomes from detection and avoidance demonstration experiments. ● Provides rationale for specific requirements related to relevant international standards (ISO 15964).
	Detection and avoidance systems for uncrewed aircraft systems (ISO 15964)	● Specifies requirements for RADAR and cameras used in detection and avoidance. ● Developed in alignment with the detection and avoidance processes described in ISO 21384-3:2023.

**Created by Japan Radio Co., Ltd. based on the FY2023 Results Report: Information Collection Costs/Survey of Cases Contributing to Strategic Use of Standards at NEDO. Materials can be obtained from the following URL: (https://www.nedo.go.jp/seika_hyoka/database_index.html)*

Table 3: Role distribution among companies

Japan Radio Co., Ltd.	Coordination of Drone Detection and Avoidance Processing System. Development of Target Detection RADAR. Drafting of the Proposal for ISO 15964 Standard.
Nippon Avionics Co., Ltd.	Development of Drone Obstacle Recognition Optical System.
ACSL Ltd.	Development of Drone Detection and Avoidance Processing System.
Mitsubishi Research Institute, Inc.	Support for International Standardization Activities of ISO 15964.

3. Social Impact of the Results

With the standardization of detection and avoidance procedures and the systems that implement them based on supporting documents, regulatory authorities are expected to accelerate legislation efforts. This will further enhance airspace safety and contribute to the realization of an energy-efficient society in which drones play an active role across a wide range of applications.

[Notes]

*1 Examples of near-misses with manned aircraft

Refer to p.16 of " detection and avoidance Measures for Aircraft and Uncrewed Aircraft, and Between Uncrewed Aircraft (Ministry of Land, Infrastructure, Transport and Tourism, Civil Aviation Bureau, November 8, 2016)."
https://www.mlit.go.jp/common/001153086.pdf

*2 NEDO DRESS Project

A project promoted by NEDO from 2017 to fiscal 2022, consisting of four items: [1] Development of performance evaluation standards for robot and drone aircraft, [2] Development of uncrewed aircraft operation management systems and detection and avoidance technology, [3] Promotion of international standardization related to robots and drones, and [4] Leading research on flying cars, aiming to realize an energy-efficient society.
Project overview: https://www.nedo.go.jp/activities/ZZJP2_100080.html

*3 ISO 21384-3:2023 Unmanned aircraft systems Part 3: Operational procedures

Overview: https://www.iso.org/standard/80124.html
(Reference) NEDO release "Japan's proposal on uncrewed aircraft detection and avoidance adopted and published in revised
international standard" (October 6, 2023)
https://www.nedo.go.jp/news/press/AA5_101696.html

*4 ISO/TR 23267

Overview: https://www.iso.org/standard/87386.html
(Reference) NEDO release "Technical report on uncrewed aircraft detection and avoidance from Japan published by ISO" (April 22, 2024)
https://www.nedo.go.jp/news/press/AA5_101740.html

*5 ISO 15964

Overview: https://www.iso.org/standard/84450.html

4. Contact Information

(For inquiries regarding the content of this news release)

NEDO Aerospace Department E-mail: aero_admi[*]ml.nedo.go.jp

Japan Radio Co., Ltd., Business Promotion Department, Marketing & Public Relations Group, E-mail: pr[*]jrc.co.jp

Nippon Avionics Co., Ltd., Corporate Planning Division, Planning Department
https://www.avio.co.jp/contact/

ACSL Ltd., Public Relations TEL: 03-6456-0931

Mitsubishi Research Institute, Inc., Mobility and Communications Division TEL: 03-6858-3729

** To send an inquiry by email, please replace [*] with @ in the above email address.*

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