Japan Drone Operation Safety White Paper 2026

Designing Safe Operations Beyond Pilot Skill

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Chapter 1 Introduction

Why I Wrote This Paper

I have spent years delivering training and conducting on-site evaluations focused on drone operational safety management.

In addition to supporting the implementation of CRM (Crew Resource Management) and SMS (Safety Management System), I have been actively deploying D-LOSA (Drone Operational Line Safety Assessment) in the field across Japan's drone industry.

Throughout this work, one question has come up repeatedly.

> On what basis does a field team decide that an operation is safe?

The introduction of a national licensing system and the codification of flight rules represent meaningful progress. However, having a regulatory framework in place does not automatically mean that judgment standards at the operational level are in place.

What has consistently emerged through training and field evaluations is that most accidents and near-misses do not originate from failures of piloting skill. They originate from gaps in operational design: no documented abort criteria, role assignments shared only verbally, no post-flight review, no records retained. These gaps, accumulated over time, create instability in the field.

This white paper starts from that reality. Its purpose is to reexamine what a safe operational framework actually requires. It is not intended to promote any specific company, product, or service. It is intended to provide a structured basis for evaluating safety in drone operations and to offer practical direction for sustainable implementation.

This paper is designed to be revised annually, reflecting not only changes in regulation and market conditions but also shifts in what is actually happening on the ground.

Purpose of This Paper

This paper is not about piloting skill.

Its purpose is to give organizations operating in Japan's drone industry — corporations, public agencies, and operational service providers — a structured framework for determining what safe operations actually look like, and practical evaluation criteria they can apply in the field.

Is compliance with regulations sufficient for safety? Is having a licensed pilot enough?

The answer to both questions is: not by itself.

> Drone operational safety is not determined by individual skill alone. It is shaped by pre-flight design, decision-making criteria, information sharing, and systematic review.

This paper presents that perspective in language grounded in operational practice.

How to Use This Paper

This paper is organized in three layers.

Layer	Content
Current State	What is actually happening in drone operations today
Evaluation Framework	What criteria determine whether an operation is safe
Implementation Guidance	Where organizations should start and how to build a sustainable safety system

Each chapter can be read independently, but reading through in sequence reveals a single unifying thread: how to design operational safety. The self-check questionnaire and field tools are compiled in the appendices. They are designed for immediate use in internal sharing, training, and vendor evaluation.

Chapter 2 The Current State of Drone Operations in Japan

Rapid Expansion, Slow Safety Infrastructure

Commercial drone use in Japan has expanded rapidly over the past several years. Across construction, infrastructure inspection, surveying, agriculture, and logistics, drones have become an established part of day-to-day operations in many sectors.

Aircraft performance has improved. The barrier to basic flight has come down. Autonomous flight, obstacle avoidance, and return-to-home functions have made the hardware increasingly capable.

But a smarter aircraft does not automatically produce a safer operation.

Regulatory Framework in Place; Field Judgment Standards Are Not

In 2022, Japan's Civil Aeronautics Act was revised to establish a national drone licensing system. The introduction of Class 1 and Class 2 Unmanned Aircraft Pilot certifications, alongside codified flight rules, was a significant step forward for the industry.

However, having a licensing system and having a safe operational judgment framework are separate problems. A license confirms that a person holds a certain level of knowledge and piloting skill. It does not guarantee that the operation they are about to conduct has been safely designed.

Across many operations today, the following patterns remain common.

- Flight continuation criteria are left to individual experience and judgment
- Abort conditions are not defined in advance; decisions are made on the spot
- Assistants and ground observers are deployed without clear role definitions
- Post-flight review is not a standard part of operations
- Near-misses go unrecorded and are not passed on to the next operation

None of these are regulatory violations. But none of them constitute a safe operational posture.

The Contracting Side Also Lacks an Evaluation Framework

This is not only a problem for operators. Organizations that contract drone services — construction companies, public agencies, infrastructure managers — have not developed adequate frameworks for evaluating the safety management practices of the vendors they hire.

Currently, the standard checks on the contracting side are two: whether the operator holds a national license, and how many hours or jobs they have logged. Both are relevant. But neither is sufficient to assess whether an operator's safety framework is sound. An operator can be licensed and experienced while still running operations that are entirely dependent on one individual's judgment — meaning risk varies from site to site.

Regulatory Compliance and Safe Operations Are Not the Same Thing

> Regulatory compliance is the minimum condition for safe operations. It is a starting point, not an endpoint.

In manned aviation, systematic incident reporting and analysis have been used for decades to accumulate safety knowledge across the industry. This culture has not yet taken root in Japan's drone sector. Published accident data is limited. Near-miss sharing does not happen across organizational boundaries. The result is a structure in which the same mistakes are repeated at different sites.

What this paper addresses is the absence of a shared evaluation framework: a clear basis for determining what a safe operation looks like.

Global Trends in Drone Safety Management

Safety management challenges in drone operations are not unique to Japan. The gap between regulatory compliance and genuine operational safety — between having a licensed pilot and having a designed operation — is a challenge that operators, regulators, and contracting organizations face in every market. The following international developments reflect a shared direction of travel.

United States (FAA)

At major U.S. drone industry conferences in 2025, representatives from the FAA, Amazon Prime Air, and UPS Flight Forward engaged in formal discussion on SMS integration for drone operations. An FAA representative stated publicly that SMS is no longer the exclusive domain of manned aviation. CRM is referenced five times in the FAA's UAS rulemaking notice (14 CFR 107 NPRM), signaling a shift from treating it as optional to treating it as a standard component of operational design.

Europe (EASA)

EASA mandates SMS for manned aviation operators and maintenance organizations (Part-145). Drone-specific SMS mandates have not yet been introduced, but operations in the Specific category and above require individual risk assessment through SORA, creating a framework that incorporates safety management principles by design.

In EASA's ERP design guidance (AMC1 Article 11), applicable to Specific category and above operations, the provision of first aid by qualified personnel — until emergency services arrive — is explicitly named as an ERP design element.

Australia (CASA)

Private training providers in Australia have developed CRM and human factors curricula specifically for drone operators, applying knowledge from manned aviation to the drone operational context. This practitioner-level integration is more advanced than in most other

markets.

Thailand (CAAT)

Thai regulations require drone operators to prepare emergency plans that include the carriage of fire extinguishers or first aid kits. The explicit codification of equipment requirements at the regulatory level represents a more prescriptive approach than most other jurisdictions have taken.

Where Japan Stands

Against this backdrop, Japan has moved quickly on licensing and flight rules — at a pace comparable to or faster than Europe and North America. Where Japan lags is in the operational implementation of SMS and CRM: translating safety management concepts from the regulatory framework into day-to-day field practice. The frameworks exist. The field deployment is the gap.

For international organizations considering Japan market entry or operational partnership, this gap is relevant. The regulatory environment is mature. What varies across operators is whether safety is designed into the operation or delegated to individual judgment. This paper's evaluation framework provides a basis for making that distinction.

Chapter 3 How Drone Operations Fail: Five Recurring Patterns

A Scene from an Infrastructure Inspection

The following is a composite drawn from patterns observed across multiple field sites, not a description of any specific incident.

Element	Description
Situation	Drone deployed for bridge inspection. One pilot, one assistant. Pre-flight briefing lasted approximately five minutes. No abort criteria were discussed.
What Happened	About thirty minutes into the operation, wind picked up. The pilot noticed the aircraft becoming less stable but continued, reasoning that the job was nearly complete. The assistant recognized the situation but could not identify an appropriate moment to speak up.
Outcome	The operation completed. No post-flight review was conducted. The instability the pilot had felt was not recorded and was not passed on.
Where the Problem Was	Not piloting skill. Three things were missing: abort criteria had not been defined in advance; the assistant's role had not been clearly established; there was no post-flight review.

No accident occurred. But nothing in that operation prevents the same situation from being repeated.

Looking at How Operations Break Down, Not Just at Accidents

Safety failures in drone operations do not always announce themselves as crashes. In most cases, the operation finishes and everyone moves on. But beneath that surface, structural weaknesses accumulate — vulnerabilities that could surface at any time.

This chapter identifies five recurring patterns of failure. They are not the problems of any particular company or individual. They are structural problems that emerge wherever operational growth outpaces the development of safety frameworks.

The Five Failure Patterns

Pattern 1 Insufficient Pre-flight Design and Preconditions

The site has not been surveyed before the day of the operation. Weather criteria have not been established. A ConOps has not been prepared. Coordination with stakeholders was handled verbally.

When the unexpected occurs in this environment, there is no documented basis for decision-making. Response quality becomes a function of whoever is present that day.

Pattern 2 Ambiguous Role Assignment

The pilot is focused on flying. The assistant understands their job as "speak up if something happens" — but no one has defined what "something" means.

An assistant who is effectively just watching does not contribute to safety. Without pre-defined role clarity and authority to act, the presence of additional personnel does not reduce risk.

Pattern 3 Absence of GO / NO-GO and Continuation / Abort Criteria

Whether to continue or stop is decided in the moment, based on the atmosphere and individual judgment: "The wind has picked up a bit, but let's see how it goes." "The client needs this finished today."

Without documented GO / NO-GO thresholds, every decision is made from scratch. Outcomes vary by operator, by day, and by circumstance.

Pattern 4 Communication Breakdown in the Field

During flight, information is not flowing between pilot and assistant. The pilot is absorbed in aircraft

control and misses changes in the environment. The assistant notices something but cannot find the right moment to act on it.

This is not a skill problem. It is a failure in how the team's communication has been designed.

Pattern 5 No After-Action Review

When the flight ends, the day is done. What went well, what was uncertain, what was close — none of it is recorded. Near-misses remain in individual memory and are never fed back into the next operation.

Without structured review, the same judgment gaps recur at the same sites.

Chapter Summary

Returning to the opening scenario: three of the five patterns were present simultaneously. Insufficient pre-flight design. Ambiguous role assignment. No post-flight review. Any one of those being in place could have changed the outcome.

What these patterns share is not individual failure. They are failures of operational design. The next chapter identifies the evaluation criteria for addressing them.

Chapter 4 Five Evaluation Criteria for Safe Operations

How to Use This Chapter

This chapter is the core of this paper. The five failure patterns identified in Chapter 3 all lead to the same question: what was not designed? These five evaluation criteria answer that question.

Each criterion includes a five-level state description. The purpose is not to generate a score. It is to identify where your organization currently stands and to determine what should be addressed next.

Criterion 1 Pre-flight Design

This criterion examines whether the purpose of the operation, site conditions, weather thresholds, stakeholder coordination, and risk assumptions have been documented before flight.

The core question is: has the design of the operation been written down? What is being flown,

where, under what conditions, and what prerequisites must be met before entering the site?

Level	Description
5	ConOps and flight plan documents are standardized and prepared with full purpose, conditions, and risk assumptions for every operation
4	Templates exist, but completeness varies by operator
3	Operators prepare individually, but nothing is documented
2	Verbal confirmation only; no records retained
1	No established pre-flight procedure

Criterion 2 Role Assignment and Coordination

This criterion examines whether the pilot, assistant, and manager each understand their role and decision-making authority before the operation begins.

Ambiguous roles in normal conditions become paralysis in emergencies. There is a fundamental difference between "placed at the site" and "placed at the site with a defined role."

Level	Description
5	Roles, decision authority, and initial emergency response actions are documented and confirmed with all team members before every operation
4	Roles are assigned but initial emergency response is not pre-shared
3	Verbal confirmation between team members, but no documentation
2	Pilot-centric; assistant role is undefined
1	No concept of role assignment

Criterion 3 Standardization of Decision-Making Criteria

This criterion examines whether criteria for flight authorization, continuation and abort decisions, and initial response to abnormal situations are documented and shared — rather than left to individual judgment.

Where Criterion 1 addresses pre-flight preparation, this criterion addresses decision rules that govern whether to proceed, stop, or respond during and at the start of a flight. Even well-prepared operations can collapse at the decision point if these rules are absent.

Level	Description
5	GO / NO-GO criteria, continuation / abort conditions, and initial response to abnormal

	situations are documented and reviewed by all team members before every operation
4	Criteria exist but initial response to abnormal situations is not pre-shared
3	Individual operators have personal criteria, but these are not standardized across the organization
2	Every decision is made in the moment based on individual judgment
1	No decision criteria exist

Criterion 4 After-Action Review and Improvement

This criterion examines whether pre-briefing, debriefing, record-keeping, and corrective action have been built into operations as standard components.

What happens after a flight determines the quality of the next one. Operations without structured review repeat the same uncertainties and the same risks.

Level	Description
5	Pre-briefing and debriefing are conducted after every operation, with records and corrective actions maintained as an ongoing system
4	Both are conducted but records and corrective actions are not sustained
3	Verbal review occurs after flights but nothing is recorded
2	Discussion only when a problem has occurred
1	No review practice exists

Criterion 5 Organizational Safety Management

This criterion examines whether safety-related education, reporting mechanisms, and accountability structures are functioning as organizational systems — not left to individuals.

Individual care and organizational safety assurance are different things. The question is whether consistent safety standards can be maintained regardless of which operator is assigned or which site is used.

Level	Description
5	SMS is implemented; education, reporting, and improvement cycles function as organizational systems
4	Safety management structures exist but their operation depends on specific individuals
3	Rules exist but education and reporting mechanisms are not in place
2	Safety management is left to individual awareness and experience

1	No organizational concept of safety management

What the Five Criteria Reveal

These five criteria are not independent. They are interdependent. Solid pre-flight design will not save an operation where roles are ambiguous. Documented decision criteria will not improve if there is no after-action review. Strength in one criterion cannot compensate for absence in another.

The practical starting point is to identify which criterion is weakest and address that first.

Chapter 5 Safety Management Concepts for Drone Operations

Purpose of This Chapter

SMS (Safety Management System) and CRM (Crew Resource Management) are standard concepts in manned aviation. In Japan's drone industry, they are still often received as technical jargon — recognized but not operationalized.

This chapter focuses not on theoretical definitions but on what actually changes in the field when these concepts are applied.

What Is SMS (Safety Management System)?

In simple terms: a structured approach to maintaining safety through organizational systems rather than through individual effort or vigilance. 'Being careful' is not safety management. Having a system that maintains consistent safety standards regardless of who is assigned or where the operation takes place — that is what SMS provides.

SMS is built on four components.

Component	Description
Safety Policy	Declaring the organization's commitment to safety and establishing clear accountability
Risk Management	Identifying potential risks in advance and defining organizationally acceptable risk thresholds
Safety Assurance	Ongoing verification that actual operations align with policy and risk

	management standards
Safety Promotion	Sustaining and improving organizational safety awareness and capability through training and information sharing

Implementing SMS in drone operations means running these four components in a form suited to the scale and reality of the organization. It does not mean building an enterprise compliance system.

What Is CRM (Crew Resource Management)?

CRM originated in manned aviation as a response to accidents that could not be prevented by piloting skill alone. Its purpose is to improve decision-making quality by fully utilizing the information, judgment, and communication capacity available across the team.

Applied to drone operations: an operation in which the pilot holds all responsibility and makes all decisions carries elevated risk. An assistant who is just watching carries similar risk. In a field operation where CRM is functioning, the following is normal:

- The assistant can raise concerns to the pilot without hesitation
- The pilot, who may want to continue, is able to receive and act on an abort recommendation
- The full team operates with shared situational awareness and shared decision criteria

This is not a technical discussion. It is a discussion about how the team's decision-making has been designed.

What Is Debriefing?

A debriefing is a structured after-action review conducted after a flight. A common misconception is that debriefings are only necessary when something went wrong. In practice, a proper debriefing is conducted after every operation, including those that went well.

A debriefing does not establish blame. It addresses three questions: Where did the operation diverge from the plan? Were there moments of uncertainty — and if so, what caused them? What will change for the next operation? Even a short, consistent practice of asking these questions accumulates organizational knowledge over time. Records ensure that knowledge transfers when personnel change. That accumulation is what raises organizational safety standards.

How the Three Concepts Connect in Practice

SMS, CRM, and debriefing are not separate systems. They function as a single flow in the field.

> Prepare the operation in accordance with organizational risk management standards (SMS). Share information and make decisions as a team during the operation (CRM). Review after the operation and integrate lessons into the next one (Debriefing).

When this flow is established, safety is no longer dependent on the condition of whoever is assigned that day. It becomes an organizational capability.

Chapter Summary

What SMS, CRM, and debriefing share is a shift in perspective: from safety as an individual responsibility to safety as an organizational design challenge. From 'be careful' to 'build the system.' From 'one person carries it' to 'the team decides together.' From 'forget it when it's done' to 'record it and apply it next time.' That shift is the essential step forward in drone operational safety management.

Chapter 6 Implementation Models

Purpose of This Chapter

This chapter translates the concepts from Chapter 5 into practical implementation direction, organized by organization type. The starting point is not building a perfect system. It is identifying what can be started today, at the scale and capacity of the organization as it currently exists.

Model 1 Small Operators: Minimum Standardization to Reduce Individual Dependency

The objective of this model is to move away from operations that depend entirely on one person's experience and judgment, by establishing a minimum set of documented standards.

Target	**Operators with 1–3 pilots managing field operations. No dedicated safety manager. No capacity for complex management systems.**

Typical Current Challenges

- Safety management depends on the lead operator's personal experience
- Documentation is limited to a flight plan; no after-action records
- Role assignment is handled verbally

Three Starting Points

① Standardize a pre-flight checklist

The ideal is a full ConOps and flight plan for every operation. The practical first step is a single-sheet checklist covering four areas: weather confirmation, site confirmation, aircraft confirmation, and role confirmation. Having these four items in writing changes the quality of field judgment.

② Document GO / NO-GO criteria

Write down the conditions under which operations proceed and the conditions under which they do not. Wind speed, visibility, operator condition, site status. The goal is to shift the basis for this decision from feeling to a documented reference.

③ Record one line after every flight

A full formal debriefing may not be feasible. The habit of writing one sentence about what was noticed in today's operation — whatever caught attention, whatever created uncertainty — begins the accumulation of near-miss data and provides a basis for review.

Model 2 Mid-Size Operators: Embedding Role Clarity and Systematic Records

The objective of this model is to reduce variance in safety management across operators and sites by establishing shared information structures and sustainable operational practices.

Target	Operators managing multiple pilots and assistants across concurrent sites. Motivated to build internal safety systems but uncertain where to start.

Typical Current Challenges

- Operational quality varies significantly across operators
- Near-misses remain in individual memory; no organizational sharing
- Safety accountability is diffuse

Three Starting Points

① Designate a safety management responsible person

As organizations grow, accountability for safety tends to become unclear. The role does not need to be full-time. But naming a safety management responsible person, and establishing them as the single point of contact for safety-related reporting, is the structural foundation.

② Build a near-miss reporting mechanism

Create a simple channel for operators to report what they noticed. The form can be minimal. What matters is establishing organizational culture in which reporting does not lead to blame — and in which reports are used for improvement.

③ Introduce periodic debriefing

Debriefing after every flight is the goal. The starting point is a monthly review session. A regular forum for sharing field experience and documenting improvement points creates the organizational knowledge base that stabilizes safety across operators.

Model 3 Contracting Organizations and Public Agencies: Vendor Evaluation Criteria

For construction companies, infrastructure managers, public agencies, and others who contract drone operations externally — and need a framework for evaluating whether their vendors are managing safety adequately.

Evaluation Item	What to Look For
Flight plan / ConOps	Is one prepared for every operation? Is the format standardized?
Documented GO / NO-GO criteria	Is the basis for abort decisions in writing?
Defined role assignment	Are assistant roles and initial emergency response pre-shared?
Near-miss records	Is there a system for reporting, recording, and sharing incidents?
After-action review practice	Is debriefing a routine part of operations?

Asking these five questions distinguishes an operator that has a license and flight hours from an operator that has designed safety into the way they work. The evaluation standard on the contracting side directly shapes the incentive for operators to build these systems.

Chapter Summary

What the three models share is the principle that a perfect system is not the starting point. Small operators start with a checklist and a one-line record. Mid-size operators start with named accountability and a reporting channel. Contracting organizations start with a set of evaluation questions. In every case, there is one thing that can be changed today. That is where to start.

Chapter 7 Self-Assessment

How to Use This Chapter

This chapter provides a self-assessment tool for identifying where your organization currently stands against the five evaluation criteria. Answer the 20 questions with yes or no. The purpose is not to generate a high score. The areas where 'no' concentrates are the areas to address first.

> This assessment is most effective when completed by multiple people involved in operations management, not by one person alone. Individual responses tend toward 'probably yes.' Group responses tend to surface what has not actually been shared.

Self-Assessment Questions

A Pre-flight Design (Criterion 1)

No.	Check Item	Yes	No
1	Is a flight plan or ConOps prepared for every operation, including purpose, conditions, and risk assumptions?	□	□
2	Is site survey (terrain, obstacles, restricted airspace) completed before the day of the operation?	□	□
3	Are weather criteria (wind speed, visibility, etc.) established as shared numeric thresholds across all operators?	□	□
4	Is there a procedure to confirm that stakeholder coordination is complete before the operation begins?	□	□

B Role Assignment and Coordination (Criterion 2)

No.	Check Item	Yes	No
5	Are the roles and decision authority of pilot, assistant, and manager documented and shared before every operation?	□	□
6	Does the assistant have a pre-shared standard for what to observe and	□	□

No.	Check Item	Yes	No
	what to report?		
7	Is an initial emergency response procedure pre-shared with all team members on site?	□	□
8	Is there an environment in which team members other than the pilot can assess situations and speak up?	□	□

C Standardization of Decision-Making Criteria (Criterion 3)

No.	Check Item	Yes	No
9	Are GO / NO-GO criteria documented and accessible to all operators?	□	□
10	Are continuation and abort criteria pre-shared for in-flight decision-making?	□	□
11	Is there a defined response procedure for aircraft malfunction, communication failure, or injury?	□	□
12	Are decision criteria retained as organizational documents, not held only in individual memory?	□	□

D After-Action Review and Improvement (Criterion 4)

No.	Check Item	Yes	No
13	Is a pre-briefing (purpose, roles, key cautions) conducted before every operation?	□	□
14	Is a debriefing (after-action review) conducted and recorded after every operation?	□	□
15	Does the organization have a system for recording and sharing near-misses?	□	□
16	Is there a procedure for improvement actions identified in review to be applied to the next operation?	□	□

E Organizational Safety Management (Criterion 5)

No.	Check Item	Yes	No
17	Is a safety management responsible person formally designated within the organization?	□	□
18	Is safety-related education and training conducted on a regular schedule?	□	□
19	Is there an organizational culture in which reporting near-misses leads to improvement rather than blame?	□	□
20	Are safety management systems in place that function consistently	□	□

No.	Check Item	Yes	No
	regardless of which operator is assigned?		

Interpreting Your Results

Result	Interpretation
0–3 No answers	Core operational design is in place. The next step is to review and update systems on a regular basis.
4–9 No answers	Partial gaps exist in specific areas. Review which sections (A–E) show concentration and refer to the corresponding criterion in Chapter 4 and implementation model in Chapter 6.
10+ No answers	Fundamental redesign of the operational safety framework is needed. Use Chapter 6 to identify one starting point and begin there.

Chapter Summary

The self-assessment is not a judgment of current performance. A high number of 'no' answers is simply today's starting point. Use the results to determine where to direct attention first.

Chapter 8 Recommendations

What This Chapter Is

This chapter presents specific direction for action by stakeholder type, based on the challenges identified throughout this paper. These are not criticisms. They are practical proposals for improvement that can be sustained in the field.

For Operational Service Providers

> Move from operations that depend on individual pilot experience to operations that are deliberately designed.

Holding a license and complying with regulations is the starting point. What comes after is building an operational framework that maintains consistent safety standards regardless of who is assigned. Three specific starting points:

First: document GO / NO-GO criteria and abort conditions. Ending the practice of leaving these decisions to individual judgment is the first step in safety management.

Second: make debriefing a standard part of every operation. Consistent after-action review is how field knowledge accumulates in the organization.

Third: build a mechanism for recording and sharing near-misses. Organizations that do not leave small anomalies in individual memory are the ones that prevent larger failures.

For Contracting Organizations

> Expand vendor evaluation criteria from license and track record verification to operational framework verification.

A national license and flight hours are important pieces of information. But they do not tell you whether a vendor has designed safety into their operations. The five items in Chapter 6 (Model 3) are the basis for that evaluation: flight plan documentation, documented GO / NO-GO criteria, defined role assignment, near-miss records, and review practice.

When the evaluation standard on the contracting side changes, the incentive for operators to build safety systems changes with it. Contracting organizations have significant leverage over the safety culture of the industry as a whole.

For international organizations operating in or entering the Japan market, these same criteria apply. The regulatory environment in Japan is mature. What distinguishes vendors is whether their safety management is designed or delegated. The framework in this paper provides a practical basis for making that assessment.

For the Industry as a Whole

> Move the conversation about safety from individual care to judgment criteria and operational design.

Japan's drone industry has advanced significantly on the regulatory side. What needs to develop next is a field judgment culture. What manned aviation built over many decades is a cross-organizational system for reporting and analyzing incidents — a system in which reporting does not lead to blame and in which shared information raises industry-wide safety standards.

Building that culture in the drone industry takes time. But there are places to start. Individual operators recording their reviews. Contracting organizations verifying safety frameworks. Industry associations creating forums for information sharing. That accumulation is what raises the floor.

Closing

This paper has consistently argued for shifting the framing of drone operational safety from an individual problem to a design problem.

Safety is not willpower, credentials, or years of experience. It is what you decide in advance, how you make decisions in the field, and what you preserve afterward. It is the accumulation of those design choices.

If this paper changes the way even a few readers look at operations, that is enough.

2026 DAIYASERVICE Inc.
CEO Noriyuki Toide

Appendix A Quick Operational Safety Self-Check

How to Use

This is a quick-reference version designed for use in internal circulation, morning briefings, and training. Unlike the 20-question assessment in Chapter 7, this is designed for a manager or operator to complete in under five minutes. A single 'No' answer should trigger a pre-flight confirmation before the day's operations begin.

No.	Check Item	Yes	No
1	Has a flight plan or ConOps been prepared?	□	□
2	Have weather conditions (wind speed, visibility) been verified against numeric thresholds?	□	□
3	Have GO / NO-GO criteria been shared with all team members?	□	□
4	Are pilot and assistant roles clearly established in advance?	□	□
5	Has the initial emergency response procedure been shared with all team members?	□	□
6	Is there a plan to conduct an after-action review following today's operation?	□	□
7	Is there a system in place for recording near-misses?	□	□
8	Is the safety management responsible person clearly identified?	□	□

Record	
Date	
Flight Site	
Verified By	

Appendix B Pre-briefing Checklist

How to Use

Conduct with pilot, assistant, and site manager present, before the operation begins. Estimated time: 5–10 minutes. Read-aloud format is recommended.

① Today's Operation Overview

- Has the purpose and scope of today's work been shared with all team members?
- Has the flight area and route been confirmed?
- Has the planned flight duration and completion condition been confirmed?

② Weather and Environmental Conditions

- Has wind speed and direction been checked? (Threshold: __ m/s or below)
- Has visibility and cloud base altitude been checked?
- Have obstacles and restricted airspace at the site been confirmed?
- Has coordination with stakeholders and landowners been completed?

③ Aircraft and Equipment

- Has the pre-flight inspection been completed?
- Has battery charge and backup battery status been confirmed?
- Have communication and video systems been operationally verified?
- Has an emergency landing point been identified?

④ Role Confirmation

- Does every team member understand the role of pilot, assistant, and manager?
- Does the assistant know what to observe and what to report?
- Does every team member know who does what in an emergency?

⑤ GO / NO-GO Confirmation

- Are all GO conditions for today's operation in place?
- Has the abort criteria been reviewed with all team members?
- Has everyone confirmed: 'If something feels wrong, say it out loud'?

Notes and Concerns

(Free text)

Appendix C Debriefing Record Template

How to Use

Record as soon as possible after the flight ends. Estimated time: 5–15 minutes. This is not a session for assigning blame. It is time for improving the next operation. Records should be shared and retained by the team, not kept in individual notes.

Basic Information

Item	Entry
Date	
Flight Site	
Participants (Roles)	
Flight Duration	
Recorder	

① Deviations from Plan

Were there any points where today's operation differed from what was planned?

Example: Wind was stronger than forecast. We delayed the start by 15 minutes. Wind did not reach the documented abort threshold, but there was a moment of uncertainty about the decision.

② Decision Points of Uncertainty

Were there moments during the flight where the decision to continue, abort, or change course was uncertain? If so, what caused the uncertainty?

Example: Wind picked up about 30 minutes in and the decision to continue was unclear. The abort threshold was documented as a gust speed, but the relationship to average wind speed was ambiguous.

③ Near-Misses

Were there any moments that did not become a significant problem but felt off?

Example: The assistant noticed an obstacle but was uncertain when to speak up. The report to the pilot was delayed as a result.

④ What Worked

Which procedures, decisions, or coordination practices worked particularly well in today's operation?

Example: Because we confirmed the emergency landing point together during the pre-briefing, the team responded immediately and without hesitation when an aircraft anomaly occurred.

⑤ Improvement Actions for Next Operation

What should be changed, added, or corrected before the next operation? Include responsible person and target date.

Improvement Action	Responsible	Target Date

Japan Drone Operation Safety White Paper 2026

Designing Safe Operations Beyond Pilot Skill

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