

ANNEX II

[Flight Standards]
[Air Operations & Aerodromes]

Runway Overrun Awareness and Alerting System

Mitigating Measures For Temporary Exemptions

Table of Contents

1	Introduction.....	3
2	General Principles.....	3
3	Mitigating Measures.....	3
3.1	Additional Flight Crew Training.....	4
3.1.1	Requirement.....	4
3.1.2	Context.....	4
3.1.3	Purpose.....	4
3.1.4	Demonstration.....	4
3.2	Flight Data Monitoring (FDM).....	5
3.2.1	Requirement.....	5
3.2.2	Context.....	5
3.2.3	Purpose.....	5
3.2.4	Demonstration.....	5

1 Introduction

A runway excursion is an event in which an aeroplane veers off or overruns the runway surface during either takeoff or landing. A runway overrun awareness and alerting system (ROAAS) acts as an active safety enhancement tool to flight crews during the approach and landing phases of flight operations, in order to reduce the risk of longitudinal runway excursion (overrun). It uses real-time data to provide flight crews with timely alerts when the aeroplane is at risk of not being able to stop within the available distance to the end of the runway.

The installation of a ROAAS is mandated for European operators on newly produced large aeroplanes operated in commercial air transport as of 1 July 2026 (refer to Part-26). An equivalent mandate also exists in ICAO Annex 6, which requires compliance as of 1 January 2026, and which is applicable to third country operators flying into the EU Territories (refer to Part-TCO). In order to ensure an equal treatment between European and third country operators and in line with the principle of non-discrimination in international air transport, EASA has decided to enforce ROAAS compliance for third country operators only as of 1 July 2026, similar to European operators.

Certain large aeroplane manufacturers are not able to meet the above deadlines, resulting in a situation where some operators flying within Europe are not able to comply with the requirement to install a ROAAS on their (newly-built) aeroplanes. Based on a survey and the corresponding data obtained from the aeroplane manufacturers, time-limited exemptions may be issued for European and third country operators until and including 31 March 2027.

Given the safety impact of a ROAAS, it is deemed necessary to impose risk mitigating measures as a necessary condition to issue time-limited exemptions. This report presents these mitigating measures, together with their rationale and expected impact.

2 General Principles

As a general rule, the mitigating measures have been developed with the following principles in mind:

- The goal of mitigating measures should be to reduce the risk of longitudinal runway excursions of those aeroplanes that are not equipped with a ROAAS (while they should according to the mandate). If the overall fleet-wide level of safety can be improved, this is considered an additional benefit, but not a must.
- Mitigating measures should never contradict the primary safety objective that a ROAAS should provide and only impact the operators in correspondence with the potential lack of the additional safety barrier that ROAAS would bring.
- A mitigation measure must not be counterproductive to safety or be confusing to the flight crew.
- Any mitigation measure should have its effect the latest at the time of dispatch, causing no additional burden on the operating crew during flight operations.

3 Mitigating Measures

In total, two mitigating measures are introduced to compensate for the lack of ROAAS during the exemption period, being: additional flight crew training and flight data monitoring (FDM). Each measure is explained in more detail below, together with some additional considerations and the expected implementation.

3.1 Additional Flight Crew Training

3.1.1 Requirement

Large aeroplane operators must include additional runway excursion prevention in their flight crew training programs. This training should be done using realistic scenarios, assuming ROAAS is not installed.

3.1.2 Context

Flight crew training should contain training on the risks and prevention of runway excursions. This training should be provided in classroom/Computer Based Training (CBT) or in the simulator (or a combination thereof). Data for the training should be identified through the safety data collection process of the aeroplane operator's SMS. The following list gives some examples of data sources:

- Runway excursion toolkits from the industry, e.g. ICAO/IATA/Flight Safety Foundation
- Own reporting programme
- FDM Data
- Company procedure
- Safety Information Exchange Programme with other aeroplane operators
- In-house incident and accident reports
- External incident and accident reports
- Safety conferences and meetings
- International safety programmes
- Lessons learned from past incidents or accidents

3.1.3 Purpose

Training on runway-excursion risks and prevention is highly valuable, as it strengthens the crew's ability to recognize and manage threats using procedural, operational, and human-performance defences. In addition, specific training on this topic will also assist to:

- Recognize common threats (contaminated runway, tailwinds, unstable approach, high/fast approach)
- Practice decision-making under time pressure (e.g. go-around)
- Interpret correctly landing-distance assessments
- Improve awareness of factors that reduce braking effectiveness (wet/icy runways, crosswinds)
- Use of any method for which the operator is approved, to evaluate the landing distance as acceptable
- Emphasize stabilized approach criteria
- Understand landing performance margins
- Use reverse thrust, autobrakes and manual braking techniques properly
- Improve callout discipline
- Address techniques for recognizing and breaking error chains
- Ensure reduced variability in how crews handle marginal conditions
- Lower the probability of dangerous runway excursions
- Demonstrate proactive safety oversight
- Improve early detection of developing risks where automation offers no support
- Enhance operational resilience in increasingly degraded or unreliable navigation environments (GNSS)

3.1.4 Demonstration

The operator should be able to provide evidence that flight crews operating a fleet type in which ROAAS-exempted aeroplanes are present have received a refresher training on the risks and prevention of runway excursions. Such demonstration should be in accordance with the size and complexity of the operator's organisation and might consist of any of the following types: classroom, computer-based or simulator training (or a combination thereof).

If an operator considers that such refresher training is practically unfeasible to fully implement before 1 July 2026, it is expected that a new mandatory item for the approach briefing is introduced in the absence of ROAAS, for as long as an effective training cannot be completed.

3.2 Flight Data Monitoring (FDM)

3.2.1 Requirement

The aeroplane operator must include and monitor aeroplane parameters related to potential runway excursions in their Flight Data Monitoring (FDM) Programme for those aeroplanes for which a temporary ROAAS exemption is requested. When there is no regulatory requirement to establish such FDM Programme, there is no expectation to initiate this for the purpose of the mitigation measure.

3.2.2 Context

Existing regulations require aeroplane operators to establish a flight data monitoring programme (FDM) for aeroplanes in excess of 27.000kg. This programme should include parameters closely related to the risk of runway excursion. Examples of such parameters might include:

- Deep landing – a certain distance behind the glide slope touchdown point
- Short landing – touching down before the glide slope touchdown point
- Long flare – a landing flare which takes more than a certain number of seconds from e.g. 15 ft above the runway to touchdown
- Monitor spoiler deployment during landing
- Late flaps settings – can be associated with rushed approaches
- Tail and crosswind
- Stabilised approach criteria
- Threshold crossing height
- Excess speed over the threshold
- Use of reverse thrust
- Use of brakes
- High speed exits from runways

Each operator should determine which (additional) parameters should be included, based on the size and complexity of the operator's FDM Programme. In the context of ROAAS, recognizing it is a system utilising satellite-based data, FDM programmes should be adapted to ensure data validity and interpretability in environments where navigation integrity may be compromised. This includes appropriate flagging of affected data and correlation with known interference-prone regions.

3.2.3 Purpose

Flight Data Monitoring assists as a predictive tool to identify safety hazards in flight operations. In addition and in the context of a Safety Management System (SMS), the data from FDM should be used to set safety performance targets. Furthermore, it can also act as a valuable tool to debrief flight crews. Data can be extracted from the FDM database and can be used in a de-identified manner in flight crew safety courses as case studies.

3.2.4 Demonstration

When requested, operators can demonstrate compliance with this mitigating measure by providing consolidated results from their FDM Programme over the last months of operation.