

Appendix D: Safety

Our safety objectives stem from the UK State Safety Programme which provides the criteria for an acceptable level of safety performance as required by the International Civil Aviation Authority (ICAO).

To remain in line with the UK State Safety Programme acceptable level of safety performance, and to continue to provide a safe service, our overarching objective is to maintain or improve safety levels by ensuring that the number of serious or risk bearing incidents per flight does not increase, and if possible decreases.

We will continue to measure safety performance against a range of metrics to ensure that we maintain or improve performance.

Even with our excellent historical performance this objective will be challenging to achieve, especially as traffic recovers and is expected to grow beyond 2019 levels. Our primary focus is to drive the right behaviours and outcomes across the organisation, and ensure appropriate effort is spent on improving safety.

Our achievement against this objective will continue to be monitored and reported, and will be subjected to ongoing tests and challenges by our own internal review processes, along with CAA Safety & Airspace Regulation Group regulatory oversight.

The expected increase in beyond visual line-of-sight drones and the emergence of other new airspace users, such as commercial space launches and vertical take-off vehicles, during NR23 will provide new challenges to UK airspace and to our operation. There are many uncertainties about how this new market will evolve, but it has the potential to compound current risks, such as infringements to controlled airspace, and to introduce new ones. To mitigate this, our plan contains the funding required to ensure the continued safety of commercial aviation.

The safety management system

Our safety management system sets out the processes that we follow to review, monitor and manage safety effectively and allows us to identify issues so that those who need to act upon them can do so in a timely manner. It is benchmarked using the EASA safety management survey with key performance indicators that specify the minimum level of effectiveness to be achieved. We are currently meeting, and aim to continue to meet, these requirements.

The measurement of safety, and the use of performance indicators, is an important part of our approach to determining the safety of our operations and the management of risks. Since 2015, the European Risk Assessment Tool (RAT) has been used to assess any event in which required separation is lost, and other events are also within the scope of the RAT scheme. We intend to continue to use RAT and its associated scheme, complemented by other measures as described below, during NR23.

The RAT assesses the severity of the event, the degree to which separation was lost, and the extent to which the incident was under control, by looking at how well the controller handled the event from detection, plan, execution and recovery. This closely aligns with a barrier model of air traffic management, where events that were adequately resolved by the controller in a timely manner are

considered to be less severe compared to events where control was lost, and the resolution of the event relied upon pilot action or providence.

Safety performance & metrics

We will use a range of metrics to monitor safety performance and to measure progress against our objective to maintain or improve safety levels in NR23. This includes:

- > Rate or number of serious incidents (including airprox events and RAT events)
- > Effectiveness of safety management
- > Other metrics to measure major sources of risk and safety events

Only metrics related to the rate or number of serious or risk bearing incidents will be targeted. All other metrics will be for monitoring purposes only. This wider monitoring allows us to assure appropriate resources are being utilised to mitigate current risk as well as identifying emerging risk and operating with reactive agility.

Rate or number of serious incidents (including airprox events and RAT events)

The RAT and airprox risk categories enable us to target a set of measures to monitor and compare our performance using an internationally recognised methodology. We will target four metrics in NR23 using airprox classifications and the RAT score.

Number of category A and B airprox attributable to NERL

An airprox is a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. It is an independently assessed risk measure that is widely understood across the aviation industry, and is a universally accepted measure of accident risk. The airprox risk classification is assigned on the basis only of the actual risk, not potential risk.

ICAO PANS 4444 defines airprox categories as :

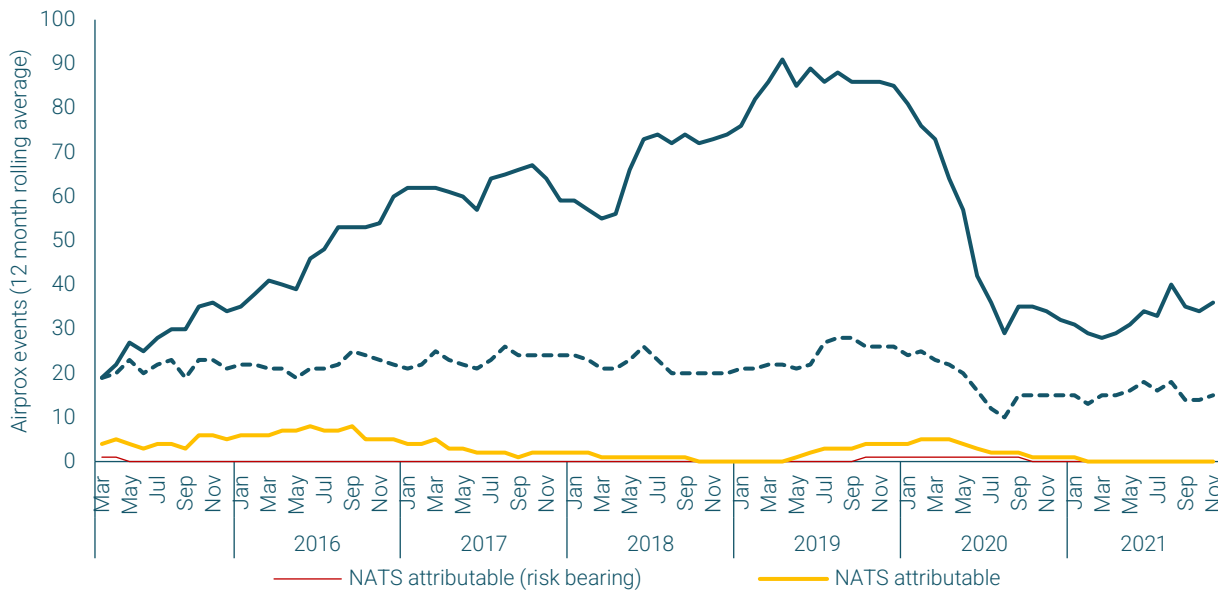
- > **A - Risk of collision:** The risk classification of an aircraft proximity in which serious risk of collision has existed. An A airprox may or may not be deemed to be a Serious Incident as defined by ICAO Annex 13
- > **B - Safety not assured:** The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised
- > **C - No risk of collision:** The risk classification of an aircraft proximity in which no risk of collision has existed
- > **D - Risk not determined:** The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination

As shown in the table and chart below, the number of airprox excluding drone incidents in airspace where we provided an air traffic control (ATC) service has steadily reduced over time. Events which were attributable to NERL have reduced from around 40 per year during the period 1998 – 2004 to four in 2019 (pre pandemic traffic levels). The number of airprox, since 2016, directly relates to the number of aircraft movements, with a large reduction seen in 2020/21.

| Airprox in UK en route airspace | Total (any culpability, any grade) | NERL attributable (any | NERL attributable |
|---------------------------------|------------------------------------|------------------------|-------------------|
|---------------------------------|------------------------------------|------------------------|-------------------|

| | | grade) | (categories A and B) |
|------|----|--------|----------------------|
| 2016 | 60 | 5 | 0 |
| 2017 | 59 | 2 | 0 |
| 2018 | 74 | 0 | 0 |
| 2019 | 85 | 4 | 1 |
| 2020 | 32 | 1 | 0 |
| 2021 | 38 | 0 | 0 |

Airprox events since 2016



En route airprox events

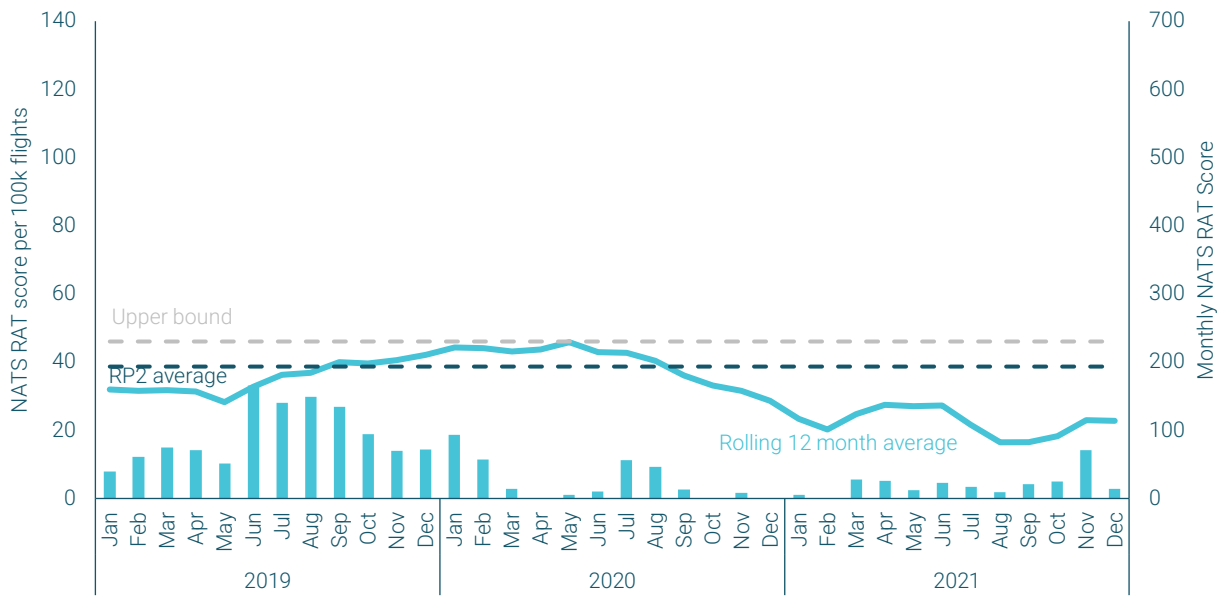
In NR23 we target zero risk-bearing (ICAO PANS 4444 defined Category A and B) airprox events.

Number of category A and B RAT events attributable to NERL

In NR23, we aim to maintain or reduce the number of Category A and B RAT events, in relation to previous reporting periods, aiming for a level of two or less.

NERL attributable RAT score per 100k movements:

This target is assessed with reference to both the controllability element of the RAT (measuring how well the safety event was managed, including the detection, plan, execution and recovering actions taken) and severity element (measuring how serious the event was based on the rate of closure and minimum achieved separation) of the RAT scheme, and relates only the score attributable to NERL. The blue line in the graph belows indicates the 12 month rolling average, and clearly shows the relationship of the RAT score with traffic. It will be challenging to maintain or improve safety levels as traffic recovers from the current low levels.



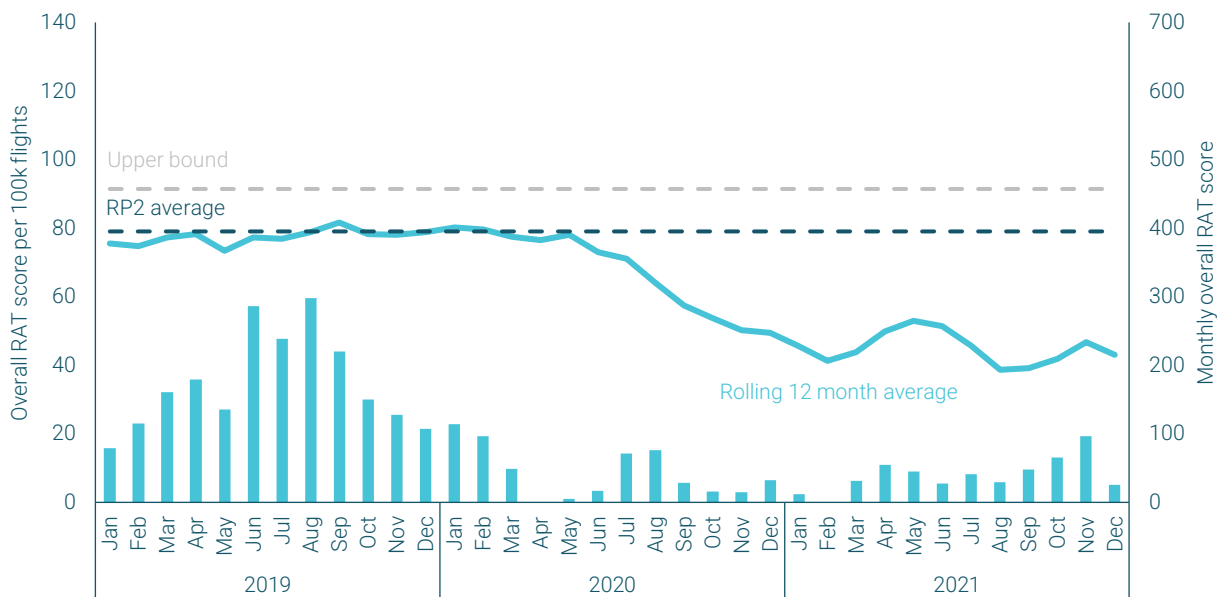
En route NERL attributable RAT score per 100k movements

Given the strong relationship between the number of safety events and traffic volumes, it is difficult to set an appropriate baseline to measure performance against at the current low traffic levels. In NR23 we will aim to maintain or reduce the number of category A and B RAT events attributable to NERL relative to an appropriate baseline that takes account of the level of traffic.

Overall RAT score per 100k movements

This follows a similar methodology as above, but also provides a measure of events where NERL made no contribution but other actors, such as the pilot were causal or contributory to the outcome. It represents the overall risk of the event to the travelling public.

As noted above, in NR23, we aim to maintain or reduce the number of overall RAT points relative to an appropriate baseline that takes account of the growing traffic levels in NR23.



En route overall RAT score per 100k movements

Summary of targets

Given the strong relationship between safety performance and traffic, the current low level of aircraft movements due to Covid-19 mean it is difficult to identify the appropriate baseline for monitoring safety performance in NR23; traffic is due to grow from 6% below 2019 levels at the start to 2% above 2019 levels by 2027. Work is currently underway to determine a suitable baseline to measure NR23 performance against, taking into account the expected traffic growth.

| Metric | Target |
|--|---|
| Number of category A and B airprox attributable to NERL | Zero |
| Number of category A and B RAT events attributable to NERL | Maintain or reduce the number of our RAT A or B events (two or less)* |
| NERL attributable RAT score per 100k movements | Maintain or reduce NERL attributable RAT points per 100K movements* |
| Overall RAT score per 100k movements | Maintain or reduce the Overall RAT points per 100K movements* |

* in line with NR23 baseline to be defined

Summary of NR23 safety targets

Effectiveness of safety management

The effectiveness of our safety management system will be targeted across the following objectives:

- > Safety policy and objectives
- > Safety risk management
- > Safety assurance
- > Safety promotion
- > Safety culture

The effectiveness in each of these areas is determined using a moderated self-assessment process. The targets set in RP3 required the achievement of Level C (“implementing: defined and standard processes are used for managing safety”) in all areas except ‘safety risk management’ where the higher level of D (“managing and measuring: objectives are used to manage processes and performance is measured”) was required. We were assessed in March 2020 and found to meet these maturity levels.

While the metric stems from the European performance framework, we intend to continue to use it in NR23 to ensure our safety management system contributes to our overall objective to maintain or improve safety levels.

Other metrics to measure major sources of risk and safety events

In addition to the targeted measures described above, we will continue to monitor and address many other performance indicators throughout NR23. The monitoring of these event types, which are major sources of risk, will inform proactive safety management activities to maintain or improve the numbers and rates of these events in line with the overall safety objective for NR23.

These measures include:

- > **Losses of separation:** A defined loss of separation between airborne aircraft when specified separation minima are breached

- > **Runway incursions:** Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing or take off of an aircraft
- > **Danger area infringements:** The unauthorised entry of an aircraft into an active Danger Area
- > **Infringements of controlled airspace:** The unauthorised entry of an aircraft into controlled or temporarily restricted airspace
- > **Level busts:** A level bust is defined as a deviation of 300ft or more from an assigned level. In certain circumstances this is reduced to 200ft
- > **Overloads:** An ATC situation during which a controller experienced excessive workload to the point where the safety of aircraft was, or could have been, compromised
- > **Uncrewed Air Vehicle (UAV) reports:** Events recording the sighting of UAVs

We will also measure performance against a specific set of safety metrics for the oceanic service. Detail is provided in [Chapter 8](#).