ICAO

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NORTH ATLANTIC SYSTEMS
PLANNING GROUP
(NAT SPG)

NAT Annual Safety Report

2024 Edition

Foreword

The 2024 edition of the North Atlantic Annual Safety Report reflects the continued commitment of the NAT region to maintaining a high standard of aviation safety in the world's busiest oceanic airspace. While a number of Safety Key Performance Indicators (SKPIs) and Target Levels of Safety (TLS) were not fully met this year, the overall safety performance remains robust and well-managed.

The increase in traffic volume—reaching a record 2.25 million flight hours—has naturally introduced new challenges. Despite this, the region has demonstrated resilience through proactive safety oversight, effective mitigation strategies, and the successful prevention of many potential deviations. The majority of reported events were managed proactively , and no accidents occurred in the NAT High Level Airspace (HLA) in 2024.

The NAT Scrutiny and Oversight Groups have identified key areas for improvement, including the operational impacts of GNSS interference, procedural transitions such as the removal of Oceanic Clearances (OCR), and coordination complexities. These insights are being actively addressed through collaborative initiatives, updated guidance, and enhanced monitoring.

This report underscores the region's strong safety culture, its capability to adapt to evolving operational demands, and its unwavering focus on continuous improvement. The NAT SPG remains confident that the measures in place—and those being developed—will ensure the NAT HLA continues to operate at a level of safety that meets or exceeds global expectations.

Safety Policy

The North Atlantic Systems Planning Group (NAT SPG) aims to achieve the highest level of safety performance and meet regional safety objectives in line with national and international standards, the Global Aviation Safety Plan (GASP), and the Global Air Navigation Plan (GANP). This group is committed to developing, implementing, maintaining and constantly improving strategies and processes while ensuring that all aviation activities take place under a balanced allocation of organizational resources.

Objective

The objective of the NAT SPG member States is to maintain and, where possible, improve the agreed safety standards in all activities supporting the provision of air navigation services in the NAT Region:

- All involved States are accountable for the delivery of the agreed level of safety performance in the provision of air navigation services in the North Atlantic Region.
- All involved States are accountable for the delivery of the agreed level of safety performance in aircraft operations in the North Atlantic Region.
- Safety in the NAT Region is managed through the organization and activities of the relevant implementation and oversight groups established by the NAT SPG, in coordination with the non-member States and observers, to achieve its Safety Objective.

Guiding Principles

The NAT SPG will act to:

- **Clearly** define all accountabilities and responsibilities for the delivery of safety performance with respect to the provision of air navigation services and participation in the NAT SPG and its contributory bodies;
- **Support** the safety management activities that will result in an organizational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety within the NAT Region;
- **Share** safety related data, knowledge and expertise with concerned stakeholders;
- **Disseminate** safety information and NAT operating requirements to stakeholders;
- **Establish and implement** hazard identification and risk management processes in order to eliminate or mitigate the safety risks associated with air navigation services supporting aircraft operations in the North Atlantic Region;
- **Establish and measure** NAT Region safety performance against agreed safety standards; and
- **Continually improve** our safety performance through safety management processes.

All of the NAT member States contribute experts to the NAT SPG, or one or more of its various subgroups, and so support the overall management of safety in the Region. The NAT safety policy is enhanced by the agreement of member States to use the information shared at NAT Safety Oversight Group (NAT SOG) meetings for the purposes of education and for making safety improvements within the Region. This has paved the way for members to discuss and share information and act upon it within the framework of the NAT SPG.

Executive Summary

This edition of the North Atlantic Region's Annual Safety Report (ASR) is issued by ICAO's North Atlantic (NAT) Systems Planning Group (SPG) and covers performance for the 2024 calendar year. The NAT SPG structure was established to study, monitor, and evaluate the air navigation system in the NAT region taking into account changes to technology, changing traffic characteristics and traffic forecasts.

In 2024, the number of flight hours in the NAT HLA increased by approximately 6.7% compared to 2023, rising from 2,110,330 in 2023 to 2,251,273 in 2024 (See Figure 1 below). This marks a new record for the NAT Region, surpassing the previous peak recorded in 2023. The busiest recorded week in 2024 of 14,471 flights was 6% higher than the busiest recorded week in 2023 (13,659).

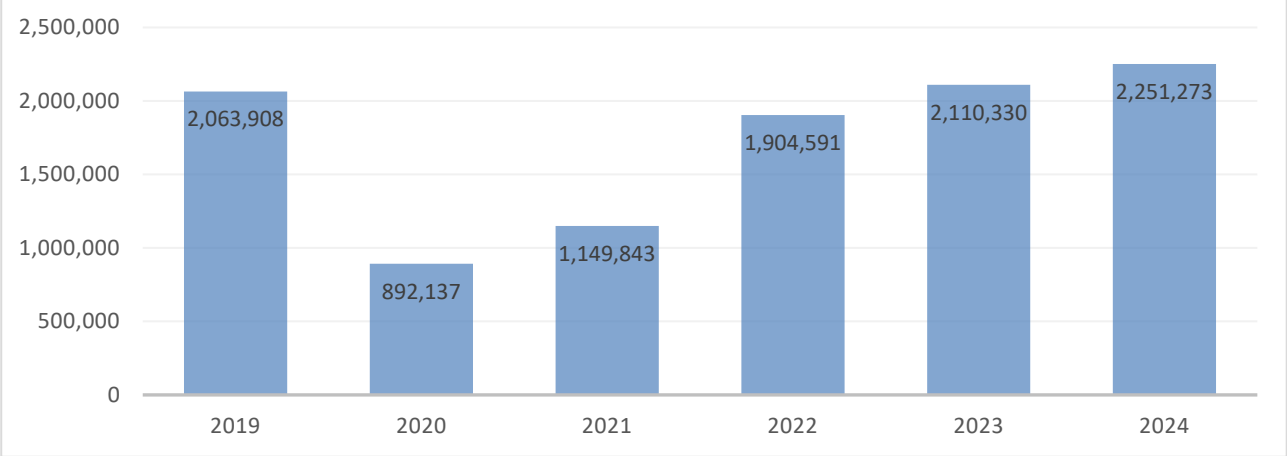


Figure 1 – Annual NAT HLA Flight Hours 2018-2024

This report includes information on flying hours from Gander, New York East, Reykjavik, Santa Maria and Shanwick. Occurrence reports from Bodø are included in the annual collision risk estimates, however were the flying hours from the Bodø OCA available, this would produce lower collision risk estimates.

In 2024, the number of events scrutinized increased by 30% in comparison to those scrutinized in 2023. The top four common causal factors remained consistent with those identified in 2022 and 2021. They were: "Flight Plan vs. Clearance", "Weather", "ATC coordination", and "Did not adhere to ATC clearances".

Safety Performance in the NAT HLA continues to be monitored by the measures and targets associated with Safety Key Performance Indicators (SKPIs), with targets based on three years of rolling data.

Based on 2024 data, only 4 of the 11 SKPIs met their associated targets, while 7 indicators fell short. The Vertical Collision Risk Estimate (CRE) for the NAT HLA increased to 33.1 x 10^{-9} fatal accidents per flight hour (fapfh) for all of the NAT HLA, which is higher in comparison to the 2023 estimate (20.3 × 10^{-9}). A possible explanation of the increased Vertical CRE can be found in CRE section below.

The 2024 lateral collision risk was estimated to be 8.1 x 10^{-9} fapfh, which represents a 36% decrease from 2023 (12.7 x 10^{-9}). The decrease in risk is in part due to fewer long duration events and a change to the estimate methodology, which accounts for the use of the strategic lateral offset procedure (SLOP).

The North Atlantic Scenario

The airspace of the North Atlantic HLA, which links Europe and North America, is the busiest oceanic airspace in the world. The NAT Region is a pioneer in the implementation of advanced procedures and technology supporting the progress of the global air navigation and aviation safety plans.

The traffic that is considered for the calculations in this report mainly flows in a broadly East-West orientation, in a twice-daily pattern where a daily-organized track system takes account of airspace users' needs and weather patterns. NAT traffic flow is almost exclusively jet transport aircraft that operate in the en-route phase of flight between 29,000 and 41,000 feet.

Since the Data Link Mandate in 2019, approximately 70% of the NAT traffic has been able to make use of the surveillance capability offered by space based Automatic Dependent Surveillance-Broadcast (ADS-B), augmenting the required use of Automatic Dependent Surveillance-Contract (ADS-C). The number of flights eligible for the separation standards enabled by ADS-B has increased steadily since the capability was introduced.

Communication is, to a large extent, based on satellite-based data link, also referred to as Controller-Pilot Data Link Communications (CPDLC) with High Frequency radio being utilized less often. This leads to air traffic management and operation that is fundamentally different to typical domestic operations, with a greater focus on strategic rather than tactical techniques although, as the NAT embraces new technologies this balance has begun to change.

In 2024, the number of flight hours in the NAT HLA increased by approximately 6.7% compared to 2023, rising from 2,110,330 in 2023 to 2,251,273 in 2024. This marks a new record for the NAT Region, surpassing the previous peak recorded in 2023. The NAT Economic, Financial and Forecast Group (NAT EFFG) estimated that during the peak week of 14 July 2024, approximately 14,471 flights crossed the North Atlantic, an increase of nearly 6% compared to the 13,659 flights recorded during the same week in 2023 (see Figure 2 below).

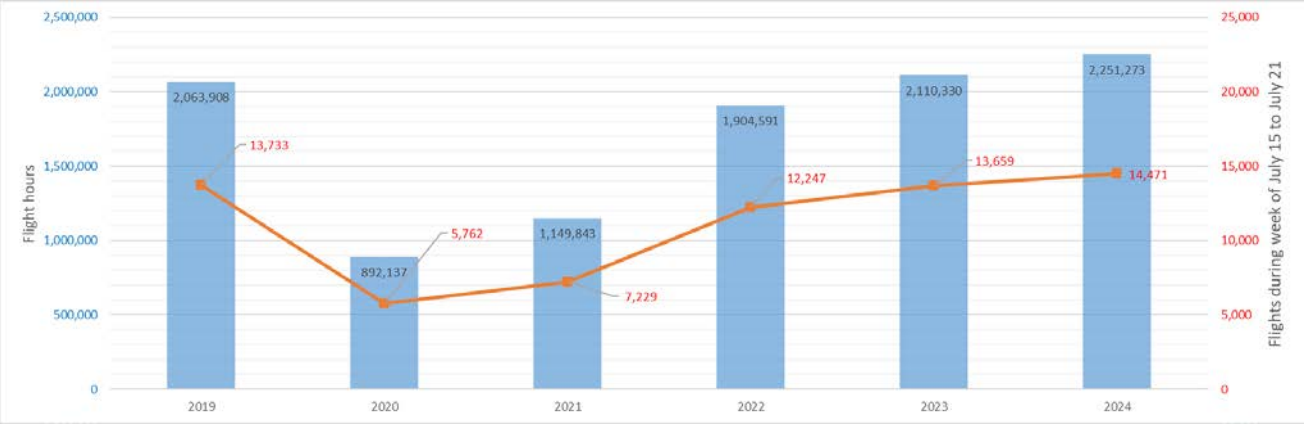


Figure 2 – Peak Traffic Flow 14 to 20 July 2024 against total NAT HLA Flight Hours 2019-2024

Safety Performance Monitoring and Measurement

Collision Risk Estimates

The estimated risk of a mid-air collision, referred to as Collision Risk Estimate (CRE), is reported in terms of fatal accidents per flight-hour (fapfh) and is calculated in the lateral and vertical planes. The model used for computation essentially assumes each aircraft is a box having a fixed x, y, and z orientation and approximates the risk of collision by integrating the crossing rate over the period when two boxes are close to each other in each dimension.

Estimates of Vertical and Lateral Collision Risk for 2024 in the NAT HLA are based on risk bearing events reported to the NAT Central Monitoring Agency (CMA) for the period January to December 2024. Flight activity data from five NAT Oceanic Control Areas (OCAs) was used in deriving an estimate of Vertical and Lateral Collision Risk. The risk estimates were calculated for the Middle zone (Gander and Shanwick OCAs), the North zone (the Reykjavik OCA), and the South zone (the New York East and Santa Maria OCAs) and then combined to derive a total risk estimate for NAT HLA. No data was available for Bodø OCA.

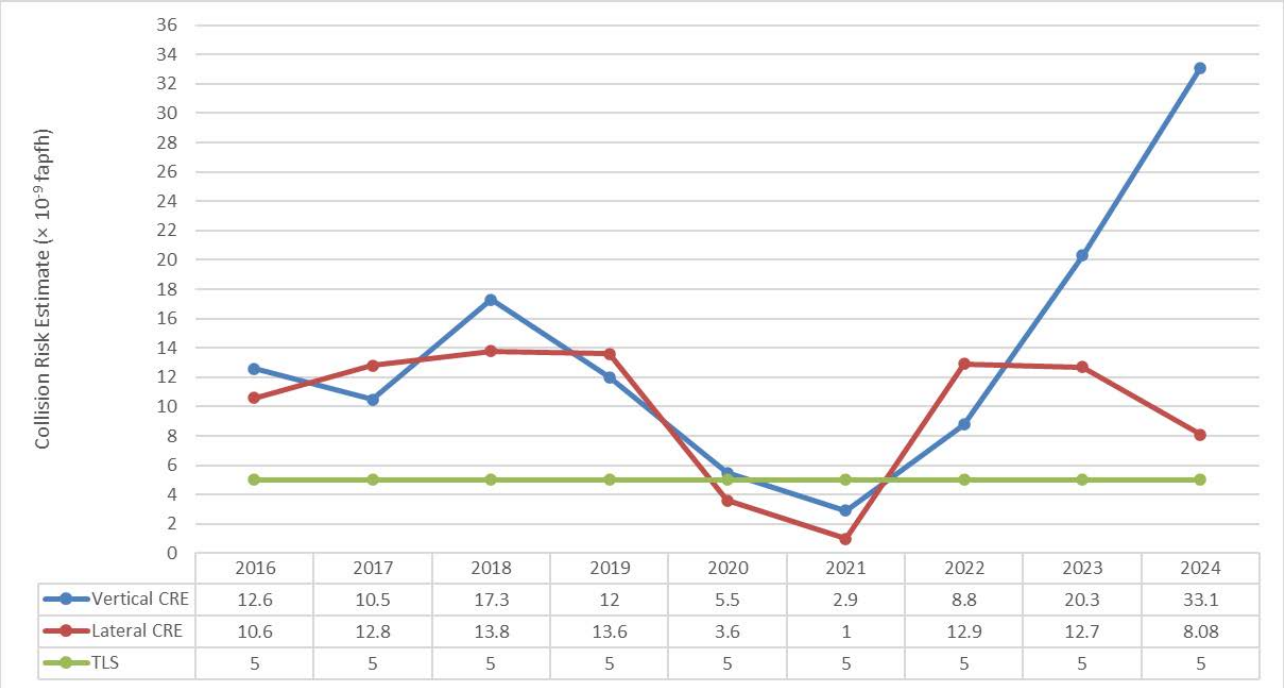
The Vertical Collision Risk Estimate for 2024 was estimated to be 33.1 x 10^{-9} fatal accidents per flight hour (fapfh) for all of the NAT HLA, which is higher in comparison to the 2023 estimate (20.3 × 10^{-9}) and almost seven times the Target Level of Safety (TLS). The reasons for the large increase in the Vertical CRE may be explained as follows:

- A major part of the overall vertical risk (90%) in 2024 was due to time spent at wrong flight levels, as it was in calendar year 2023. The contributions to the vertical CRE from the long duration reported LHDs are described below.
    - The north zone accounted for 51% of the vertical CRE due to time spent at wrong levels. There were three long duration reported LHDs (28, 24, and 22 minutes) in the North Zone. Removal of these three events would reduce the overall risk by 40% to 23.3 × 10^{-9} fapfh. One of these long duration LHDs occurred within the Bodø OCA, however the NAT MWG does not receive traffic data for the Bodø OCA. The vertical CRE for this LHD is calculated using the north zone parameters generated only from the Reykjavik OCA traffic data submission. The vertical CRE with the reported LHD from the Bodø OCA is 39.0 × 10^{-9} fapfh.
    - The longest duration LHD reported in calendar year 2024 occurred within the south zone. The duration for this occurrence was 71 minutes and accounts for 15% of the total risk estimate, the vertical risk estimate without the 71 minute duration LHD is 33.0 × 10^{-9} fapfh.
    - The vertical risk CRE without the four long duration LHDs would be 17.3 × 10^{-9} fapfh.
- Another contributing factor to the increase in vertical CRE are the annual updates for the observed cross-track error and subsequent lateral overlap probability, Py(0), which incorporates the use of SLOP. In the south zone the analysis showed more operators electing to offset from centerline compared to the middle zone. The Py(0) for the south zone reflected this result.

- There were 47 reported operational LHDs that contributed to the risk estimate in 2024. In calendar year 2023, the number was 44.

The 2024 NAT HLA Lateral Collision Risk Estimate was estimated to be 8.1 x 10^{-9} fapfh, which represents a decrease from 2023 (12.7 x 10^{-9}).

Figure 3 shows the relationship between the CREs and the TLS for the NAT HLA over the recent years. In 2024, both the vertical and lateral CREs exceeded the TLS of 5 × 10^{-9} fapfh for operational and technical errors.



	2016	2017	2018	2019	2020	2021	2022	2023	2024
Vertical CRE	12.6	10.5	17.3	12	5.5	2.9	8.8	20.3	33.1
Lateral CRE	10.6	12.8	13.8	13.6	3.6	1	12.9	12.7	8.08
TLS	5	5	5	5	5	5	5	5	5

Figure 3 – Collision Risk Estimates in the NAT HLA (2017-2024)

Safety benefit of the use of Strategical Lateral Offset Procedures (SLOP)

The NAT SOG recognizes the safety benefit of the use of Strategical Lateral Offset Procedures (SLOP) to distribute traffic between the centreline of a route and up to 2 NM right of centreline. An actual event that occurred in November 2024 was mitigated by SLOP when an aircraft mistakenly climbed without a clearance and resulted in a loss of separation with an aircraft on the same track. When that aircraft levelled off, it was side-by-side with an aircraft heading the same-direction, at the same altitude, which fortunately was flying SLOP, 2 NM right of centreline.

The application of the random selection of the offset greatly reduces collision risk in the airspace. Even utilization for each SLOP option available is the desired distribution for the region. Evidence suggests many operators apply different interpretations of SLOP. Table 1 below shows the SLOP distributions by the average of the five top and bottom conforming operators for 2024. Guidance on SLOP is available in the video found at this link: https://www.youtube.com/watch?v=-rigf7UngN0.

	Centerline	1-Mile Right Offset	2-Mile Right Offset
Top Five	35.5%	45.7%	18.8%
Bottom Four	70.0%	23.6%	6.4%

Table 1 – SLOP distributions for 2024

Note: These figures are compiled from the average of the five best conforming operators and the four least conforming operators to SLOP as provided by the NAT Mathematicians Working Group (NAT MWG).

Safety Key Performance Indicators (SKPIs)

The NAT SPG has established SKPIs and associated targets for the NAT HLA. The NAT HLA performance for the last 4 years is shown in the table below. The 2024 figures are shown in green when the performance meets the targets and in red otherwise.

Safety KPI		Target	Previous rolling three-year period of performance (2021-2022-2023)	2021 Performance	2022 Performance	2023 Performance	2024 Performance
NAT.SKPI.01	Number of accidents	0	n/a	0	0	0	**0**
NAT.SKPI.02a	Number of LHD events divided by number of flight hours flown in the NAT HLA	Reduction over previous rolling three-year period of performance	4.73×10^{-5}	4.61×10^{-5}	5.09×10^{-5}	4.50×10^{-5}	**7.06×10^{-5}**
NAT.SKPI.02b	Overall time of LHDs at unprotected flight level divided by total duration of flights in minutes	Reduction over previous rolling three-year period of performance	1.22×10^{-6}	6.23×10^{-7}	8.75×10^{-7}	2.16×10^{-6}	**1.91×10^{-6}**
NAT.SKPI.03a	Number of Lateral deviations divided by number of flight hours flown in the NAT HLA	Reduction over previous rolling three-year period of performance	6.26×10^{-5}	4.87×10^{-5}	5.25×10^{-5}	8.67×10^{-5}	**8.26×10^{-5}**
NAT.SKPI.03b	Overall time of lateral deviations on an unprotected profile divided by total duration of flights in minutes	Reduction over previous rolling three-year period of performance	1.22×10^{-6}	6.10×10^{-7}	7.18×10^{-7}	2.33×10^{-6}	**1.18×10^{-6}**
NAT.SKPI.04	Number of losses of separation events divided by number of flight hours flown in the NAT HLA	Reduction over previous rolling three-year period of performance	1.03×10^{-5}	5.22×10^{-6}	1.10×10^{-5}	1.47×10^{-5}	**1.55×10^{-5}**

Safety KPI		Target	Previous rolling three-year period of performance (2021-2022-2023)	2021 Performance	2022 Performance	2023 Performance	2024 Performance
NAT.SKPI.05a	Number of coordination errors divided by number of flight hours flown in the NAT HLA	Reduction over previous rolling three-year period of performance	1.48×10^{-5}	1.83×10^{-5}	9.98×10^{-6}	1.61×10^{-5}	**2.04×10^{-5}**
NAT.SKPI.05b	Overall time of coordination errors spent at unprotected profile divided by total duration of flights in minutes	Reduction over previous rolling three-year period of performance	1.04×10^{-6}	3.00×10^{-7}	2.63×10^{-8}	1.37×10^{-6}	**5.85×10^{-7}**
NAT.SKPI.06a	Collision Risk Estimate (CRE) in the vertical dimension	5×10^{-9} fapfh	n/a	2.90×10^{-9}	8.80×10^{-9}	20.3×10^{-9}	**33.1×10^{-9}**
NAT.SKPI.06b	Collision Risk Estimate (CRE) in the lateral dimension	5×10^{-9} fapfh	n/a	1.00×10^{-9}	12.9×10^{-9}	12.7×10^{-9}	**8.1×10^{-9}**
NAT.SKPI.07	Regional Effective Implementation (EI) score in ANS for NAT provider States	-Maintain 85% or above until 2026 -Reach 95% by 2030	n/a	89.21%	88.58%	85.15%	**85.7%**

Table 2 – Safety Key Performance Indicators (SKPIs) and associated targets (2021-2024)

As seen in Table 2 above, the Targets of some of the SKPIs were missed in 2024. This performance can be attributed to the following interrelated operational, procedural and systemic factors.

1. Increased Traffic Volume

- Flight hours rose from 2021 to 2024 by 95.7% (1149843 to 2251273)
- Average flight hours for the target period was 1721588 (2024 was an increase of 30.8% against this)

This surge in traffic naturally increases the exposure to potential deviations and coordination challenges, contributing to higher SKPI values.

2. Rise in Reported Events

- 478 events were scrutinized in 2024, up from 369 in 2023 (+30%).
- Notable increases:
    - LHDs: 159 (from 95)
    - Lateral deviations: 186 (from 183)

- Coordination events: 46 (from 34)
- Prevented events: 157 (from 94)

This rise reflects both increased operational complexity and possibly improved detection/reporting mechanisms.

3. Specific SKPIs that Increased and Why

SKPI	2024 Performance	Identified contributing factors
NAT.SKPI.02a (LHD rate – number)	7.06×10^{-5}	More LHDs reported (159 vs. 95); increased GNSS interference and OCR-related issues.
NAT.SKPI.02b (LHD rate – time)	1.22 × 10-6	Several LHDs in 2024 had extended durations which disproportionately increased the total unprotected time. OCR Implementation Issues. Weather related deviations
NAT.SKPI.03a (Lateral deviation rate)	8.26×10^{-5}	Rise in lateral deviations (186 vs. 183); weather and FMS handling issues.
NAT.SKPI.04 (Loss of separation rate)	1.55×10^{-5}	More events due to coordination errors and GNSS-related deviations.
NAT.SKPI.05a (Coordination error rate)	2.04×10^{-5}	Increase in coordination errors (46 vs. 34); issues with CDNs and manual coordination.
NAT.SKPI.06a (Vertical CRE)	33.1×10^{-9}	Driven by a few long-duration LHDs; GNSS interference and OCR misinterpretations.
NAT.SKPI.06b (Lateral CRE)		GNSS Interference, Crew Errors and FMS Handling, Weather Contingency Misapplication, Coordination Failures

4. Contributing Operational Factors

- **GNSS Interference**: contributing to both vertical and lateral deviations.
- **OCR Implementation**: The removal of Oceanic Clearances in some OCAs led to confusion, especially where crews followed RCL/FPL levels without ATC clearance.
- **Crew Misinterpretation**: Misreading CPDLC messages (e.g., UM79), truncated displays, and poor FMS handling were significant contributors.
- **Weather**: Incorrect application of weather contingency procedures was a major factor in both LHDs and lateral deviations.
- **Coordination Errors**: Often due to lack of proper handover or incorrect assumptions between sectors.

Scrutiny of events

Note1: Numbers in brackets are the 2023 figures.

The NAT Scrutiny Group (NAT SG) carried out the scrutiny of 478 (369) events which were reported to the NAT CMA as occurring in the NAT High Level Airspace (HLA) of the Oceanic Control Area (OCA) of Shanwick, Santa Maria, Reykjavik, New York East, Gander and Bodo during the year 2024. These events were categorized as follows:

- 159 (95) Large Height Deviations (LHDs)
- 186 (183) actual lateral deviations, including:
    - 55 (44) GNEs and
    - 86 (77) ATC Interventions, when the Air Traffic Controller (ATCO) caught and corrected a lateral deviation before it developed into a GNE.
- 46 (34) Coordination events, where coordination between two Units had not been correctly carried out, leading to a vertical, lateral or time event.
- 8 (6) Longitudinal Loss of Separation events.
- 157 (94) Prevented events, where the ATCO prevented a deviation or an uncoordinated flight profile from entering the airspace of another ANSP.

Note 2: It is important to note that the sum of the values will not equal to the total number of events as one event can be counted in one or more dimensions.

It is worth noting that ATC interventions and preventions are positive indicators that the ATC system has recognized an error. This is often through data link equipage capabilities where a warning to the controllers is received in sufficient time to take pre-emptive action. Underlying causes of all lateral deviations (incipient or actual) are often identical – the magnitude depends upon the timeliness of identification and corrective action.

The review of these 478 events from 2024 showed (Figure 4) that the top 10 contributing issues allocated to all events were (Arrows indicate relative position from 2023 report):

1. *Flight Plan vs. Clearance* – Aircraft were flying, or intending to fly the planned route instead of the cleared route contributed in 119 (25%) events. In most cases (82 out of the 119), deviations did not actually occur as they were pre[illegible]ed by an ATCO.
2. *Weather* - Weather conditions experienced during the flight contributed in 77 (16%) even[illegible].
3. *ATC coordination* - An error occurring during the coordination between two ATC sectors or ANSPs contributed in 61 (13%) [illegible]vents.
4. *Did not adhere to ATC clearances* - A crew, for no identifiable reason, operated a flight profile different to the ATC clearance (e.g. changed vertical profile or routed to a different waypoint which was not contained in the clearance or the filed flight plan or due to contingency) contributed in [illegible]3 (11%) events.

5. *Crew-Other* - Crew action not matching other causal factors contributed to 52 (11%) events.
6. *Incorrect Weather Contingency action* - Crew deviated from their assigned clearance to avoid adverse meteorological conditions, but did not follow the correct procedures for in-flight contingencies in Oceanic Airspace contributed in 46 (10%) events.
7. *ATC Pertinent message not actioned* - ATC did not respond to pertinent message which could have mitigated an event contributed in 38 (8%) events.
8. *Dispatch* - Flight plan issues contributed to 34 (7%) events. This includes incorrectly filed flight plans and multiple flight plans for a single flight.
9. *Crew CPDLC message* - Crew misunderstanding or misreading a CPDLC message or actioning it incorrectly, contributed in 32(7%) events.
10. *Truncated display/ARINC 424* – Flight Management Systems not displaying 13 digit coordinate waypoints and crew failure to verify waypoints contributed to 29 events (6%).

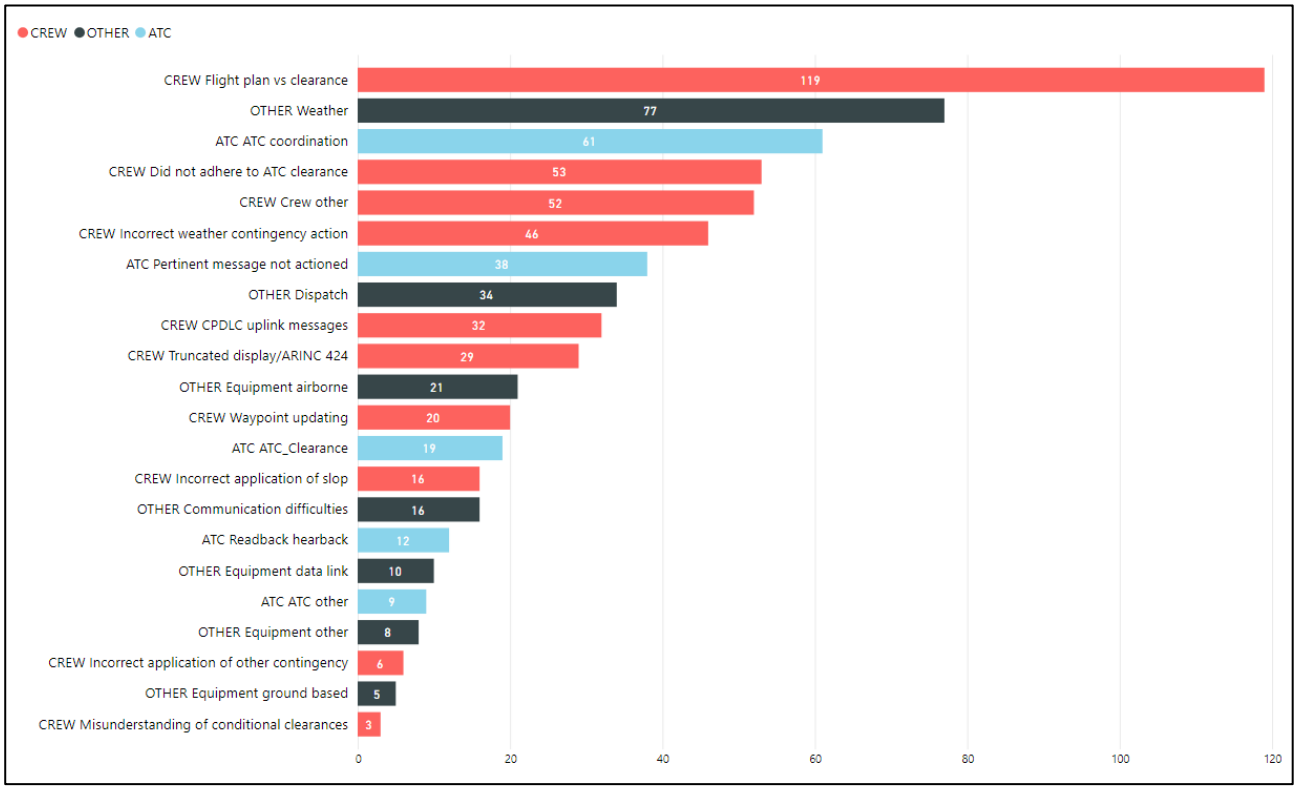


Figure 4 – Contributing issues to events in the NAT HLA in 2024

Prevented deviations for all event types were classified according to the implemented mitigations used to avert a deviation. The results of this classification are presented in Figure 5, demonstrating that the practice of requiring position reporting of “NEXT and NEXT +1” and the “CONFIRM ASSIGNED ROUTE” CPDLC message sets (UM137/DM40) are proving to be of benefit.

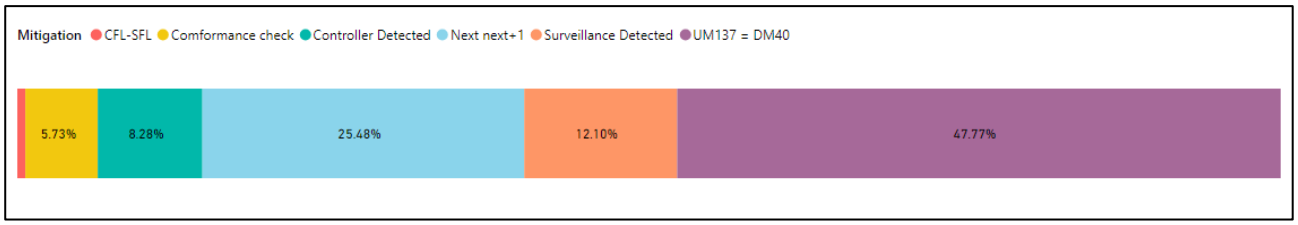


Figure 5 – Mitigations used for prevented deviation events in 2024

Further information can be found in the OESB (**https://www.icao.int/EURNAT/Pages/EUR-and-NAT-Document**) and on the NAT CMA (link) website (**https://natcma.com**).

NAT regional priorities

The NAT region, under the framework of the NAT SPG, continues to collaborate closely with States and partners to shape the future of aviation in the North Atlantic, with enhanced resilience and sustainability of civil aviation remaining the top priorities. Through innovation and the adoption of new technologies, the region is strengthening its capacity to respond to emerging challenges while enhancing the adaptability and performance of air traffic management services.

In 2024, the removal of Oceanic Clearances (OCR) commenced in the NAT Region, aligning regional procedures with global standards to support the objective of seamless airspace. OCR was implemented on the AIRAC dates of 21 March 2024 for Reykjavik and Santa Maria OCAs, and 4 December 2024 for Bodø and Gander OCAs. While the Shanwick OCA has not yet implemented OCR, the delay highlights the complexity and challenges of significant procedural changes across multiple systems, OCAs and stakeholders. The implementation process is being closely monitored, and early experiences and challenges are being shared through regional coordination to identify lessons for future progress. To support the transition to OCR, a North Atlantic Operations Bulletin was published, providing essential background information and guidance to airspace users and other stakeholders (**www.icao.int/EURNAT/NATOPSBulletin2023_001**).

Efforts to modernize route structures have also progressed, including the removal of Blue Spruce Routes and a broader rationalization of degraded navigation options. These changes support a performance-based navigation environment and reflect continued adaptation of contingency planning to evolving user and system needs.

The NAT region's dependence on satellite-based communication services, particularly those provided by Communication Service Providers (CSPs) and Satellite Service Providers (SSPs), has grown significantly over the past decade. These services are central to enabling reduced separation minima and supporting the safe and efficient delivery of air traffic services. However, the region has experienced an increase in unplanned outages and service degradations, leading to operational impacts such as delayed communications and increased controller workload. A dedicated project is currently underway to evaluate whether existing oversight mechanisms for CSPs and SSPs are adequate to meet current and future operational requirements.

To support continued safety improvements and resilient operations, the region issued specific guidance addressing the operational effects of GNSS interference. This includes the publication of a dedicated North Atlantic Operations Bulletin providing mitigation strategies and raising awareness among airspace users (**https://www.icao.int/EURNAT/NATOPSBulletin2025_001**).

As part of strengthening the region's risk management and change management processes, a review of the NAT Safety Case Framework is under way. This includes an assessment of the current NAT safety case procedure and fast-track guidance outlined in the NAT Handbook (Document 001), along with the development of enhanced supporting material to assist in the preparation and coordination of safety cases related to operational changes in the NAT.

The NAT Central Monitoring Agency (CMA), with support from the FAA and NATS Analytics teams, conducted an analysis of height-monitoring performance data for operations above FL410, including altitudes up to FL470. Completed in Summer 2024, the analysis concluded that aircraft performance up to FL450 is largely comparable to that observed at or below FL410, but insufficient data to analyse

between FL450 to 470, supporting ongoing efforts to evaluate vertical separation criteria in upper airspace being undertaken by the ICAO Separation Airspace Safety Panel (SASP).

In response to the growing presence of new entrants and commercial space operations (CSO) in the NAT region, a number of initiatives have been undertaken. NAT Doc 013 was published in 2024 to provide guidance on the integration of new entrants and CSO into North Atlantic operations. Also in 2024, the NAT region held a workshop on the integration of commercial space operations (CSO), with the aim of facilitating engagement between North Atlantic States and industry stakeholders regarding anticipated operations in the region. The workshop provided a platform to exchange information and identify the need for potential changes to procedures and systems, in order to safely integrate and harmonize CSO operations. A second workshop focused specifically on High Altitude Operations (HAO) is planned in the future.

In 2024 and 2025, the NAT DISTREX Project Team conducted a series of exercises to evaluate the operational use of Autonomous Distress Tracking (ADT) and the Location of an Aircraft in Distress Repository (LADR) in coordination with ANSPs, RCCs, and operators. The exercises helped identify procedural gaps, tested notification processes, and informed recommendations for the harmonized implementation of ADT and LADR across the NAT region.

The region is also progressing work under the NAT Space Weather Project Team to examine whether existing State contingency processes and guidance are adequate. The project team has designed a regional space weather table top exercise being planned for Q3/Q4 2025.

As the NAT region looks ahead, it remains committed to addressing emerging challenges through collaboration, innovation, and proactive planning, in line with its vision of an optimized and seamless airspace environment.

Appendix A

ADS-B	Automatic Dependent Surveillance - Broadcast
ADS-C	Automatic Dependent Surveillance – Contract
ADT	Autonomous Distress Tracking
ANS	Air Navigation Service
ATC	Air Traffic Control
ATS	Air Traffic Service
CPDLC	Controller-pilot data link communications (data link)
CSO	Commercial Space Operations
CSPs	Communication Service Providers
EFFG	Economic, Financial and Forecast Group
fapfh	Fatal Accidents per Flight Hour
GANP	Global Air Navigation Plan
GASP	Global Aviation Safety Plan
GNE	Gross Navigation Error
GNSS	Global Navigation Satellite System
HLA	High Level Airspace
ICAO	International Civil Aviation Organization
KPI	Key Performance Indicator
LD LHD	Long Duration LHD
LHD	Large Height Deviation
NAT	North Atlantic
NAT CMA	North Atlantic Central Monitoring Agency
NAT EFFG	North Atlantic Economic, Financial and Forecast Group
NAT MWG	North Atlantic Mathematicians Working Group
NAT SG	North Atlantic Scrutiny Group
NAT SOG	North Atlantic Safety Oversight Group
NAT SPG	North Atlantic Systems Planning Group
OCA	Oceanic Control Area
RFI	Radio Frequency Interference
SASP	Separation Airspace Safety Panel
SKPI	Safety Key Performance Indicator
SLOP	Strategic Lateral Offset Procedure
SSPs	Satellite Service Providers

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