NAT OPS BULLETIN

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The purpose of North Atlantic Operations Bulletin 2024-xxx is to provide background information and guidance to aircraft operators in the North Atlantic (NAT) on the requirement to notify ATC of GNSS interference, and the Air Navigation Service Provider (ANSP) procedures that will be applied to aircraft that have been exposed to Global Navigation Satellite Systems (GNSS) interference (GNSS jamming and/or spoofing) during their flight.

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1. DEFINITIONS

The following are definitions as used in this bulletin:

a) **GNSS Jamming -** An intentional Radio Frequency Interference (RFI) with GNSS signals. The interference prevents receivers from locking on to satellite signals and has the main effect of rendering the GNSS system ineffective or degraded for users in the jammed area.

b) **GNSS Spoofing -** Involves broadcasting counterfeit satellite signals to deceive GNSS receivers, causing them to compute incorrect position, navigation, and timing (PNT) data.

2. Purpose of Bulletin.

The purpose of this North Atlantic Operations (NAT OPS) Bulletin is to provide background information and guidance to aircraft operators in the North Atlantic (NAT) on the requirement to notify ATC of Global Navigation Satellite Systems (GNSS) interference (GNSS jamming and/or spoofing), and the Air Navigation Service Provider (ANSP) procedures that will be applied to aircraft that have been exposed to GNSS interference during their flight.

3. Background.

Aligned with reports in other Regions, since February 2022, the NAT has seen an increase in the frequency and severity of the impact caused by GNSS jamming and/or spoofing as well as an overall growth of intensity and sophistication of the events.

NAT ANSPs have been monitoring the effects of GNSS interference and have been working together to promote alignment and consistency in the procedures that are applied to aircraft entering the NAT Region that have been exposed to GNSS interference during their flight.

A non-exhaustive list of possible effects and impacts of GNSS jamming and/or spoofing are documented in various sources such as ***EASA Safety Bulletin SIB No: 2022-02R3*** **(** https://ad.easa.europa.eu/ad/2022-02R3 *).* The following is a list of issues that are directly impacting NAT operations:

- Failure or degradation of aircraft systems which use GNSS as a time reference or source of position information, leading to;
    - loss of, or unreliable ADS-B data,
    - loss of, or unreliable ADS-C data, (for example time errors)
    - loss of Controller Pilot Data Link Communication (CPDLC).
- Inability to conduct or maintain GNSS based Area Navigation (RNAV) or Required Navigation Performance (RNP) operations.

Note 1: Navigation specifications (RNP 4/10) are required for the application of performance-based separations.
Note 2: RNAV 10 (RNP 10) is required to operate within the NAT HLA (between FL290 – FL410).

Though the majority of GNSS jamming and/or spoofing activities take place outside the NAT Region, the inability of the aircraft to recover in-flight, leads to increased workload for both flight crews and air traffic controllers in the NAT.

The primary impact to the NAT is the ability to apply performance-based separations that rely on RNP 4/10, a working CPDLC connection, receipt of valid ADS-C data and reliable ADS-B surveillance data.

4. Operator & Flight Crew Procedures

Early Notification of GNSS interference:
Early notification of any failure or malfunction of GNSS, loss of RNP 4/10 capability, loss of CPDLC, loss of ADS-C, or loss of ADS-B enables improved ATC coordination and strategic planning of flights into the NAT utilizing non-performance-based separation minima, which could result in either no or minimal impact to the cleared profile, subject to the traffic scenario.

Late Notification of GNSS interference:
A late notification by flight crews, for example as the flight approaches the Oceanic Entry Point (OEP), or through automated ATC system alerts triggered by lack of usable ADS-B or ADS-C data, or failure to establish CPDLC connections, causes significant controller workload.

The result may be large profile changes being issued to the affected flight and in some cases to other flights to ensure the correct application of separation minima, to meet NAT requirements (e.g. HLA) or to meet coordination requirements by adjacent ANSPs.

Flight crews that experience or suspect GNSS interference enroute to the NAT Region shall notify the initial NAT ANSP in the RCL. Flights not submitting an RCL message (via New York East) shall notify New York via voice.

Notification should be included in the RCL message via ACARS or voice, confirming navigation status and detail of ongoing loss/impacts to the aircraft systems and capabilities, for example ‘ATC REMARKS/ GNSS INTERFERENCE RNP10 ONLY’, or ‘ATC REMARKS/ GNSS INTERFERENCE NO CPDLC‘

In addition, operators can also make the ANSP aware when one of their flights has been impacted by GNSS interference through direct contact.

5. NAT ANSP Procedures

Upon notification or detection of a flight that has been impacted by GNSS interference, NAT ANSPs will update flight details within their Flight Data Processors (FDP) and coordinate the flight profile with adjacent ANSPs to confirm NAT HLA status, and eligibility for application of performance-based separation minima.

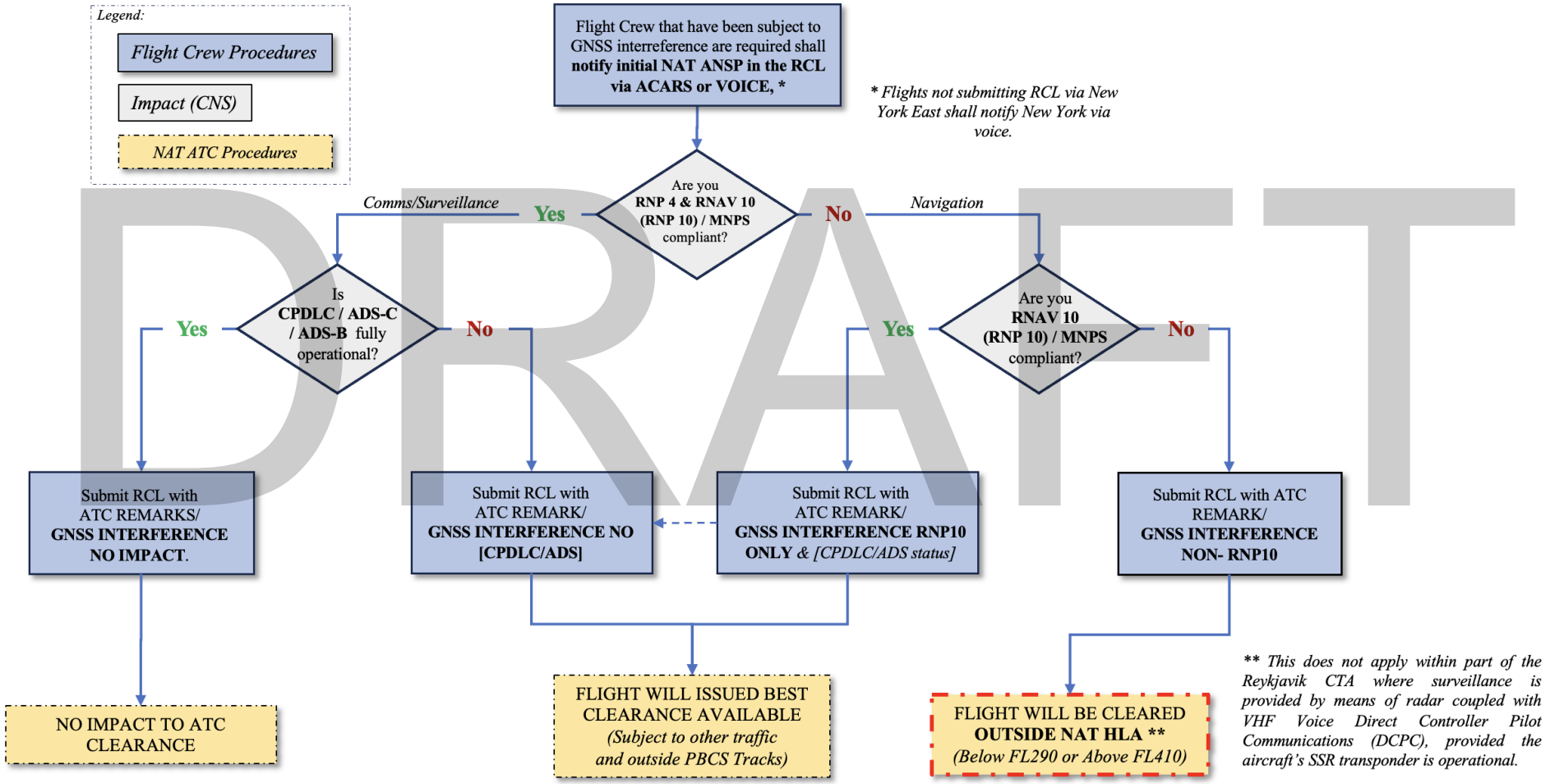
The ANSP procedures are:

- Flights that do not meet at least RNAV 10 (RNP 10) navigation capability will be cleared outside the NAT HLA (below FL290 or above FL410). This does not apply within part of the Reykjavik CTA or Santa Maria OCA where surveillance is provided by means of radar and/or Wide Area Multilateration (WAM) coupled with VHF Voice Direct Controller Pilot Communications (DCPC), provided the aircraft’s SSR transponder is operational.
- Aircraft losing RNP 4 enroute but retaining RNAV 10 (RNP 10) capability will be cleared on the most suitable profile within the NAT HLA subject to impact on other traffic and outside of PBCS tracks.
- Aircraft experiencing a CPDLC and/or ADS-C failure enroute will be cleared on the most suitable profile within the NAT Data Link Mandate airspace (FL290 – FL410) subject to impact on other traffic.
- Aircraft experiencing an ADS-B failure enroute will be cleared on the most suitable profile within the NAT HLA subject to impact on other traffic.

6. WEBSITES

The ICAO EUR/NAT Office Website is at: **www.icao.int/eurnat**. Click on **EUR & NAT Documents** >> **NAT Documents** to obtain NAT Operations and NAT Region Update Bulletins and related project planning documents.

NAT GNSS Interference Procedures



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