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SAFETY BULLETIN

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NAT Oceanic Errors Safety Bulletin (OESB)

INTRODUCTION

The attached ICAO NAT OPS Bulletin supersedes previous editions and is intended to help air operators transiting North Atlantic Oceanic Airspace avoid making commonly observed operational errors.

INCLUDED

ICAO NAT OPS Bulletin Pages 1-9 Serial Number: 2017-002_Revision 03 Subject: OESB – Oceanic Errors Originator: NAT SOG Issued: 20 January 2021 Effective: 29 January 2021

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Serial Number: 2017-002_Revision 03 Issued: 29 January 2021

Subject: OESB – Oceanic Errors Effective: 29 January 2021 Originator: NAT SOG

The purpose of North Atlantic Operations Bulletin 2017-002_Revision 03 is to promulgate the Oceanic Errors Safety Bulletin (OESB).

Any queries about the content of the attached document should be addressed to:

ICAO EUR/NAT Office: icaoeurnat@paris.icao.int

This NAT OPS Bulletin supersedes Serial Number: 2017-002 Revision 02.

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This OESB is intended for distribution to industry and training centers. The OESB will also be posted on various websites to enable broad distribution and rapid updates. In addition, the OESB should be used in conjunction with the guidance detailed in the current edition of North Atlantic Operations and Airspace Manual (NAT Doc 007). This manual can be found at http://www.icao.int/EURNAT/Pages/welcome.aspx under: “EUR/NAT Documents >NAT Documents >NAT Documents > NAT Doc 007.” Operators should consult http://www.icao.int/EURNAT/Pages/welcome.aspx for the most current version of the OESB under “EUR/NAT Documents > NAT Documents > NAT OPS Bulletins.” A sample oceanic checklist has been developed using many of the recommendations found in this OESB and can be downloaded via the same links. The OESB is promulgated by the NAT Safety Oversight Group (NAT SOG). Questions or comments regarding this Bulletin may be directed to The European and North Atlantic Office of ICAO: icaoeurnat@paris.icao.int.

The NAT OPS Bulletin Checklist is available at www.icao.int/EURNAT/EUR & NAT Documents, NAT Documents, then NAT Ops Bulletins.

There is no objection to the reproduction of extracts of information contained in this Bulletin if the source is acknowledged.

Safety Snapshot The OESB is intended to help air operators transiting North Atlantic oceanic airspace avoid making commonly observed operational errors. These include Gross Navigation Errors (lateral deviations of 10 NM or more in the North Atlantic, previously 25 NM or more), Large Height Deviations (300 feet or more) and Erosion of Longitudinal Separation. Repeated errors present a recurring hazard and pose a threat not only to overall flight safety but also planned reductions in separation. The following recommendations, resources, and tips may be useful in preventing these errors and should be addressed in initial and recurrent ground training. Additional recommendations address General considerations when operating in the North Atlantic, Flight Planning, and SLOP.

Vertical Lateral Longitudinal

Focus Areas Conditional Clearances Route Amendments CPDLC Sample Oceanic NAT Doc 007, GOLD, Quick Links Checklist, OESB LHD para. 1 OESB CPDLC OESB GNE para. 3

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Top Tips for Operators

Crews should be familiar with CPDLC messages, to include how to “LOAD,” “ACCEPT/WILCO” and “EXECUTE/INSERT” route clearance uplinks, and how to respond to “CONFIRM ASSIGNED ROUTE” messages. nsure all flight crew members are briefed on details of route amendments. Crews should flight plan to avoid turbulence and convective activity. Coordinate with ATC early for weather deviations to reduce the need to execute published weather deviation procedure. Carefully manage the Master Document, especially when there is a route amendment. Many errors involve flying the operator-filed route, rather than the ATC-cleared route. eview climb and descent clearances carefully: some conditional clearances start with “MAINTAIN FL XXX,” and then describe the condition. Also, be sure to understand the meaning of “AT” and “BY”.

LARGE HEIGHT DEVIATIONS

- Conditional clearances, especially climb clearances with delayed execution, are associated with a disproportionately high error rate. A conditional clearance is an ATC clearance given to an aircraft with certain conditions or restrictions such as changing a flight level based on a UTC time or a specific geographic position. The following is an example of a conditional clearance given to a crew: Maintain FL330. After passing 20W climb to FL350. Cross 25W level. Report leaving. Report reaching. NOTE – in this example, FL330 is the present FL. The “conditional” parts of this clearance are that after 20W, the aircraft should start the climb to FL350, and prior to 25W should reach that level.
- In oceanic, non-surveillance airspace, crews must report to ATC when vacating any previously assigned altitude or flight level and when reaching the newly assigned altitude or a flight level (for ADS-C/ CPDLC aircraft, these reports are only required when ATC specifically requests them).
- Each flight level change must be specifically approved by ATC. A filed flight plan with a requested change in flight level (step climb) is not a clearance to initiate the change in altitude.
- The phrases “expect FLxx” or “are you able FLxx” are NOT clearances. Correct phraseology for clearances is: “ATC clears….”
- Crews must know when a climb or descent should be initiated or completed. Conditional clearances usually use the prepositions “by” or “at.”
- 1 “BY” means:
- 1.1. “Before passing” when referring to a position, or
- 1.2. “Not later than” when referring to a time.
- 2 “AT” means:
- 2.1. “After passing” when referring to a position, or
- 2.2. “Not before” when referring to a time. NOTE: The following are examples of conditions or restrictions given to crews when the terms AT or BY are used in a conditional clearance.

EXAMPLES: Restriction What is Expected CPDLC Arrange the climb so that the aircraft is at

CLIMB TO REACH FL390 BY 1325 FL390 at or before 1325 UTC. REPORT LEVEL FL390 If it will not be possible to be level at FL390 at or VOICE before 1325 UTC, then: CLIMB TO REACH FLIGHT LEVEL 390 AT OR CPDLC: Do not select “ACCEPT/ WILCO.” BEFORE 1325 Select “REJECT /UNABLE” and

do not climb. REPORT REACHING VOICE: Do not commence climb and advise ATC “unable” with a short explanation.

CPDLC Arrange the descent so that the aircraft is at

DESCEND TO REACH FL320 BY 63N030W FL320 before it crosses 63 North 30 West. REPORT LEVEL FL320 If it will not be possible to be level before VOICE crossing 63 North 30 West, then: DESCEND TO REACH FLIGHT LEVEL 320 CPDLC: Do not select “ACCEPT/ WILCO.” BEFORE PASSING 63 NORTH 030 WEST Select “REJECT/ UNABLE” and do not descend. REPORT REACHING VOICE: Do not commence descent and advise ATC “unable” with a short explanation.

EXAMPLES: Restriction What is Expected

(In this example the aircraft is initially at FL350) The aircraft shall maintain FL350 until time

CPDLC 1403 UTC. At or after time 1403 UTC a MAINTAIN FL350 descent to FL330 is to commence and once

AT 1403 DESCEND TO AND MAINTAIN FL330 reached, FL330 is to be maintained. REPORT LEVEL FL330 If it will not be possible to meet this restriction, VOICE then: AT OR AFTER TIME 1403 DESCEND TO AND CPDLC: Do not select “ACCEPT/ WILCO.” MAINTAIN FLIGHT LEVEL 330 Select “REJECT/ UNABLE” and do not descend. REPORT REACHING VOICE: Do not commence descent and advise ATC “unable” with a short explanation.

(In this example the aircraft is initially at FL350) The aircraft shall maintain FL350 until passing

CPDLC 58N040W. After passing 58N040W a climb to

MAINTAIN FL350 FL360 is to commence and once reached, AT 58N040W CLIMB TO AND MAINTAIN FL360 FL360 is to be maintained. REPORT LEVEL FL360 If it will not be possible to meet this restriction, VOICE then: AFTER PASSING 58 NORTH 040 WEST CLIMB CPDLC: Do not select “ACCEPT/ WILCO.” TO AND MAINTAIN FLIGHT LEVEL 360 Select “REJECT/ UNABLE” and do not climb. REPORT REACHING VOICE: Do not commence a climb and advise ATC “unable” with a short explanation.

- Crews must be diligent in reviewing performance data for their particular aircraft, so as to avoid either requesting or accepting clearance to flight levels outside of the performance envelope of the aircraft.

NOTE: Crews must carefully consider in their performance planning the significant temperature inversions that can occur over the Atlantic Ocean. This is particularly important with aircraft operating near maximum gross weight and when requesting flight levels approaching oceanic entry points.

- Crews should be aware that failure to attain flight levels as assigned can result in a loss of planned separation between aircraft. In addition, making a last-minute request for a lower flight level and/or amended routing can create unnecessary challenges for ATC, and should be avoided if at all possible.

NOTE: If there has been a significant change affecting the aircraft weight after the operational flight plan has been computed, obtain an updated operational flight plan, which should have a more realistic altitude profile.

- If a crew finds itself at a flight level that becomes unsustainable due to degrading performance (e.g., when encountering low temperatures affecting fuel, or high temperatures affecting aerodynamics), it is imperative to coordinate a flight level change with ATC as soon as possible. If a climb or descent must be made without ATC clearance, applying the 5 NM lateral offset contingency procedure (as referenced below) will mitigate some of the risk. Crews should then diligently work to obtain an ATC clearance.
- Crews must be alert for situations when ATC issues clearances that have only a latitude OR a longitude (e.g., “at/ after passing 30W”) rather than a latitude AND a longitude. The clearance should be clearly understood as to when to make a flight level change.
- Crews must ensure they are executing the correct contingency procedure in case of lost communications. Unlike other oceans, the NAT lost communications procedure is to maintain the last assigned flight level. ATC approval is required for all flight level changes.
- Crews must have an OCEANIC clearance prior to oceanic entry. Coordinate to enter oceanic airspace at the cleared flight level and cross-check altimeters in accordance with flight manual procedures.
- NOTE: Crews must coordinate with domestic ATC to ensure they are maintaining their cleared oceanic flight level prior to the oceanic entry point. The altitude specified in the oceanic clearance is not a “when ready climb” instruction and needs to be coordinated with domestic ATC.

GROSS NAVIGATION ERRORS (GNEs)

- Fly the route received in the OCEANIC clearance – which may differ from the filed flight plan.
- A route amendment is often a contributing factor for navigational errors. Crews must ensure they correctly copy the route amendment, reprogram (and execute) the FMS (or Long Range Navigation System, LRNS), update the Master Document and update the plotting chart. The FMS route verification should include track and distance checks on legs with new waypoints in the amended route.

NOTES:

- NAT Doc 007, Chapter 8, contains guidance on use of a Master Document.
- Track and distance tables are available commercially for every ten degrees of longitude. Alternatively, it may be possible to obtain (from dispatch) or create (using an Electronic Flight Bag application) an updated operational flight plan, to verify new tracks and distances in the FMS.
- Crews must fly the route amendment (and not the filed flight plan). The pilot in command should ensure that details of the route amendment are recorded on the Master Document, and that all crew members are aware of any changes. With augmented crews, a disciplined and detailed changeover briefing with reference to the Master Document is vital.
- For route amendments which change the oceanic exit point, crews must obtain domestic routing from ATC. ATC normally expects flights to re-join the originally filed ATC flight plan route at the significant point which immediately follows the original oceanic exit point.
- Pre-flight route verification of the LRNS should include track and distance checks between oceanic waypoints. Enroute procedures should also include track and distance checks prior to reaching an oceanic waypoint.

- The crosscheck of the FMS oceanic coordinates should include comparing the expanded coordinates for the next and subsequent ("next +1") points against the flight plan, to mitigate against waypoint insertion errors. Crews should fully understand how to enter waypoints using full latitude and longitude, and/or using the ARINC 424 paragraph 7.2.5 naming convention (e.g., 5850N = N58°/W050°). Crews must understand FMS display behavior with the chosen entry method, and that waypoints may have truncated minutes (e.g., N58°30'/W050° loaded, "N58W050" displayed) and/or generic display names (e.g., N58°30'/W050° loaded, "WPT01" displayed).

NOTE: In NAT airspace where unnamed, half-degree of latitude waypoints are used, waypoint display labels can be misleading (minutes can be truncated or rounded) and/or the FMC can create a generic label). It's imperative that crews check the expanded coordinates of all oceanic waypoints. Custom waypoints in aircraft navigation databases for half-degree of latitude points should NOT use ARINC 424 paragraph 7.2.5 "Nxxyy" naming, but instead "Hxxyy" See NAT OPS Bulletin, "Waypoint Insertion / Verification Special Emphasis Items."

- Adding additional waypoints to the active route, e.g., to depict ETPs, even if along the route, can produce nuisance out-of-conformance alerts on ground-based monitoring systems. Also, crew misunderstanding about these additional waypoints has occasionally led to pilot deviations from the cleared route.
- It is strongly recommended that a plotting/orientation chart be used and procedures include a position check 10 minutes after each waypoint. Compare all waypoints on the chart against the Master Document.
- Standard Operating Procedures (SOPs) for LRNS's should be focused on verification of the clearance and of the route of flight. SOPs should promote an attitude of constant verification through independent crosschecks to verify that the clearance is correctly programmed. These procedures must also be used with route amendments.
- There should only be one Master Document on the flight deck. It should be labeled "Master" and should always reflect the current cleared route of flight.
- Crews must be alert for similar sounding named oceanic waypoints (e.g. PITAX versus BERUX). Also, crews should note that oceanic tracks often contain two subsequent named waypoints (e.g., DOGAL BEXET).
- Crews should know that ATC coordination is necessary when transiting FIR boundaries. Pilots must give controllers adequate lead time when making requests for track deviations or altitude changes, especially in areas where multiple FIRs (e.g., Brest, Madrid and Shanwick) are in close proximity. ATC coordination in such areas can become quite complex.

EROSION OF LONGITUDINAL SEPARATION

- When providing position reports via voice, crews must notify a revised estimate to ATC if a previously notified estimate is found to be in error by 3 minutes or more (see Annex 2 and Doc 7030). Accurate position reports are essential to procedural air traffic control.

NOTE: While position report errors <3 minutes are tolerated , time restrictions issued by ATC must be strictly adhered to. A restriction is issued to ensure required spacing between two aircraft is maintained.

- Crews must adhere to the assigned (True) Mach. Operators selecting "Long Range Cruise" or "ECON" modes in fact are flying variable Mach, which negatively affects ATC's ability to independently calculate projected position. As needed, crews can request speed adjustments with ATC (preferably via CPDLC).

NOTE: Crews now have the opportunity to fly other than a fixed speed (Mach) assignment. Operators can find details in NAT OPS Bulletin 2019-001 “Operations Without an Assigned Fixed Speed in the NAT (OWAFS) Special Emphasis Items (SEI).

- Crews must ensure that the aircraft master clock (typically the FMS) is set to UTC, and is used for all ETAs and ATAs. Where possible, clocks should be in GNSS-synchronized mode.

CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC)

- Crews should understand proper responses for CPDLC messages, especially ones being used more frequently in the NAT, such as: a. “CONFIRM ASSIGNED ROUTE.” Ensure the entire oceanic route is loaded before responding to this message. Use the automated response, not a free-text. b. “CLEARED ROUTE CLEARANCE” or “CLEARED TO {position} VIA ROUTE CLEARANCE.” Some cockpits display the uplinked points only when “LOAD” is selected. Once LOAD is selected and the crew confirms it loads properly and is acceptable, they should select “ACCEPT/ WILCO” followed by “EXECUTE/ INSERT” to activate the amended route in the FMS. It is vital to understand the menu hierarchy and how to load CPDLC clearances.

Guidance for CPDLC communications can be found in the Global Operational Data Link Manual (GOLD, ICAO Doc 10037).

- Conditional clearances sent via CPDLC require special attention. The following is typical scenario where a CPDLC “future execution” conditional clearance is misapplied. At approximately 1133Z the following CPDLC message was sent to the flight:

MAINTAIN FL370 AT 1205 CLIMB TO AND MAINTAIN FL390 CLIMB TO REACH FL390 BY 1215 REPORT LEVEL FL390

The expected WILCO response was received by the controller. At approximately 1134Z, the controller received a Level Range Deviation Event ADS-C notification, indicating a climb inconsistent with the clearance. Shortly thereafter, the controller received a “LEVEL FL390” message. This scenario often results in violating the minimum standard separation between aircraft.

- Upon receipt of a CPDLC uplink message, it is important for both pilots to independently and silently read, then verify with each other correct understanding of the clearance.
- It is important to note that the CPDLC uplink message may be more than 1 page in length (requires “paging” through the display). Review the entire message carefully before taking any action. It may be helpful to print the message (and thereafter confirm the printout is complete/ not corrupt).

NOTES:

- Page acknowledgements may be unique to the avionics installed in a particular aircraft. For example, on some installations, crews cannot ACCEPT/ WILCO until the last page of a message is reviewed, while in other installations, ACCEPT/ WILCO may be allowed on the first page.
- Corruptions of the CPDLC message could occur when printed. Crews should confirm CPDLC printouts are consistent with displayed messages.

- Crews should resolve any questions that they have regarding the clearance prior to initiating any action. If crews do not fully understand the CPDLC clearance, or the clearance is unexpected, such as a FL change without having requested one, they should revert to voice communication.
- Crews should review the time stamp of CPDLC messages to ensure they are not old (delayed).
- Dialogues with ATC that are initiated with CPDLC should be completed using CPDLC and dialogues begun with voice should be completed by voice. Crews should make every effort not to mix the two media.
- Crews should avoid using free-text messages when standard messages are available and appropriate. Free-text messages are not machine-read, which can complicate processing of information. For example, when receiving the CPDLC uplink "CONFIRM ASSIGNED ROUTE," crews should follow CPDLC menu prompts to send the active route. A free-text reply would defeat automated conformance checking.

NOTE: Follow flight manual procedures, which specifically describe how to send standard message (non free-text) replies to CPDLC uplinks. Some aircraft/ FMS combinations are experiencing a sporadic anomaly where the "SEND" prompt for down-linking a standard response to the "CONFIRM ASSIGNED ROUTE" is not displayed on the FMS.

- Crews should be sure that HF SELCAL is working even when CPDLC is functioning properly – do a SELCAL check at oceanic entry and at each Oceanic Control Area (OCA) boundary.

CONTINGENCIES

- Effective with the November 2020 revision in Chapter 15 of Procedures for Air Navigation – Air Traffic Management (PANS-ATM, Doc 4444), the 5 NM lateral offset contingency procedure is a global procedure, also published in NAT Doc 007, chapter 13.
- Effective with the November 2020 revision to Doc 4444, the Weather Deviation Procedure utilizing a vertical displacement of +/- 300 feet when reaching or exceeding 5 NM offset from the cleared track is likewise a global procedure, also published in chapter 13 of NAT Doc 007. It is important for pilots to understand that the ICAO published Weather Deviation Procedure is a contingency and should only be flown when an ATC clearance cannot be obtained. It is also important that pilots understand that any ATC clearance to deviate for weather should be done at the ATC-cleared altitude, without any vertical displacement.

NOTE: For weather deviations, even less than 5 NM, the pilot must request clearance from ATC. However, if ATC clearance cannot be obtained and a deviation becomes necessary, pilots must follow published ICAO Weather Deviation Procedures.

GENERAL

- Dual checking of the oceanic clearance MUST be SOP (avoid physiological breaks or distractions near the oceanic boundary or when copying and reprogramming route amendments). Route amendments must be communicated clearly in changeover briefings.
- All HF voice oceanic communications such as position reports or flight crew requests go through a radio operator. The radio operator is not an air traffic controller. Radio operators must relay all reports and requests to ATC for approval and processing.

- Relays of ATC instructions between aircraft MUST be accurate. Ensure a correct read-back is received from every communication link in the relay.
- Always read the route loaded in the FMS first and then compare it to the Master Document. This mitigates against “expectation bias,” where a pilot sees what he/she expects to see.
- Crews must immediately clarify any confusion about the clearance.

FLIGHT PLANNING

- Pilots and dispatchers should use all available resources to plan a route that avoids adverse meteorological phenomena (e.g. turbulence, volcanic ash, non-standard temperatures, convective activity, and weather at alternates). In addition, pilots should be knowledgeable about information on operational flight plans and do basic crosschecks of fuel, winds and groundspeeds.
- Dispatchers and flight planners should make every effort to file realistic routes which ATC will not need to amend. Named oceanic points, particularly at 15W and 10W, are frequently omitted from the flight plan when they should be included, or vice versa, either of which may cause ATC to amend the route.

NOTE: Shanwick publishes “Oceanic Tracks - Westbound Traffic Brief” on its website (https://www.customer.nats.co.uk/shanwick/, requires login) daily at approximately 8:30 AM London time. Crews not filing the preferred altitudes are more likely to receive an amended clearance.

- Dispatchers, flight followers, flight operations officers, flight planners and crews should ensure that Items 10 and 18 of the ATC flight plan (normally reproduced on the operational flight plan) correctly reflect capabilities and authorizations. ATC uses these codes in the application of separation standards.

SLOP – STRATEGIC LATERAL OFFSET PROCEDURES

(Only RIGHT offsets are authorized)

- Crews should use SLOP in all oceanic and remote airspace. SLOP should be a SOP, not a contingency, and operators should be endorsing the use of lateral offsets for safety reasons on all oceanic and remote airspace flights, to reduce the risk of collision and to avoid wake turbulence.

NOTE 1: SLOP should also be used on random routes due to the high density of traffic and limitations of aids such as TCAS/ACAS.

NOTE 2: Air Operators should include in the standard operating procedures clear guidance to the flight crews to ensure an even distribution of the available offsets is used.

NOTE 3: Effective 12 SEPT 2019, SLOP offsets in 0.1 NM increments, up to 2 NM right of centerline, were authorized in the NAT, in accordance with Doc 4444 provisions. Consult the applicable AIP for further details.

- The key to maximizing the effectiveness of SLOP is judiciously selecting from the available options, on a random basis. In a bi-directional environment, maintaining centerline incurs more risk than offsetting.
- Pilots may apply an offset outbound at the oceanic entry point and must return to centerline prior to the oceanic exit point unless otherwise authorized by the appropriate ATS authority or directed by the appropriate ATC unit.
- Offsets to the left of centerline are NOT authorized under SLOP and should not be flown.

- Crews should use sound management of automated flight guidance systems when establishing offsets, i.e., avoid the use of “HDG” mode due to the risk associated with neglecting to re-select “LNAV/NAV” mode.
- Crews should make sure the “TO” waypoint is correct after entering SLOP. With some avionics, when executing an offset near the active “TO” waypoint, the FMS can sequence to the “next + 1” waypoint—skipping a point. Some GNEs have resulted.

- END -



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