

## Navigational errors on the North Atlantic



The ICAO North Atlantic Systems Planning Group (NAT SPG) has issued a Oceanic Errors Safety Bulletin (OESB) concerning deviations observed on the North Atlantic Tracks.

### Background

ICAO North Atlantic Working Groups composed of industry; ATC and state regulators have noted repetitive oceanic errors. These include gross navigation errors (25 NM or more), large height deviations (300 feet or more) and erosion of longitudinal separation. Operators are reminded that the safety of the airspace is constantly monitored and its performance is reviewed. Thus, repeated errors present a recurring hazard and pose a threat not only to overall flight safety but also planned reductions in separation. It is important that operators have a continuous analysis process to evaluate oceanic errors in order to meet the ICAO Safety Management System (SMS) standards.

A sample oceanic checklist has been developed using many of the recommendations found in this OESB and can be downloaded by clicking [here](#)

The following are recommendations to reduce oceanic errors that should be addressed in initial and recurrent ground training:

### Large height deviations

- ▶ Conditional clearances require special attention. 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 main part of this clearance is that after 20W the aircraft starts the climb and is maintaining the cleared level prior to 25W.

- ▶ In oceanic, non radar RVSM airspace, during a climb or descent, crews must advise ATC when leaving and reaching a flight level.
- ▶ 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.
- ▶ Crews must ensure a CORRECT understanding of when a climb or descent should be initiated or completed.
- ▶ Crews must exercise caution and ensure a clear understanding when ATC uses the terms “by” or “at” when referring to a longitude crossing (for example when to make a flight level change). This applies whether the clearance is given via voice or data link.
- ▶ The following are examples of conditions or restrictions given to crews when the terms AT or BY are used in a conditional clearance.

<i>Example clearance</i>	<i>What is expected</i>
<p><b>Voice</b> CLIMB TO REACH FLIGHT LEVEL 390 AT OR BEFORE 1325</p> <p><b>CPDLC</b> CLIMB TO REACH F390 BY 1325</p>	<p><b>Arrange the climb so that the aircraft is at FL390 no later than 1325 UTC.</b> If it will not be possible to be level at FL390 at or before 1325 UTC, then:</p> <p><b>Voice</b> Do not commence climb and advise ATC of the situation.</p> <p><b>CPDLC</b> Do not ACCEPT the clearance; reply UNABLE and do not climb</p>
<p><b>Voice</b> DESCEND TO REACH FLIGHT LEVEL 320 AT OR BEFORE 1403</p> <p><b>CPDLC</b> DESCEND TO REACH F320 BY 1403</p>	<p><b>Arrange the descent so that the aircraft is at FL320 no later than 1403 UTC.</b> If it will not be possible to be level at or before 1403 UTC, then:</p> <p><b>Voice</b> Do not commence descent and advise ATC of the situation.</p> <p><b>CPDLC</b> Do not ACCEPT the clearance; reply UNABLE and do not descend</p>
<p><b>Voice</b> AT TIME 1403 DESCEND TO AND MAINTAIN FLIGHT LEVEL 330. REPORT LEAVING REPORT REACHING</p> <p><b>CPDLC</b> At 1403 DESCEND TO AND MAINTAIN F330.</p>	<p><b>At time 1403 a descent to flight level 330 is to commence and once reached, the specified flight level is to be maintained.</b> If it will not be possible to meet this restriction, then:</p> <p><b>Voice</b> Do not commence descent and advise ATC of the situation.</p> <p><b>CPDLC</b> Do not ACCEPT the clearance; reply UNABLE and do not descend.</p>

- ▶ If a crew finds itself at a flight level that becomes unsustainable due to degrading performance, it is imperative that they communicate immediately with ATC in order to coordinate a flight level change as soon as possible.
- ▶ Crews must be alert for situations when ATC issues clearances that have only a longitude rather than a latitude and longitude. The clearance should be clearly understood as to when to make a flight level change.
- ▶ Crews must ensure they are following 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 ensure they obtain an OCEANIC clearance level prior to oceanic entry, enter the ocean at the cleared flight level and establish a post entry point altitude check.

NOTE: Crews must be proactive to ensure that they are maintaining their cleared oceanic flight level prior to the oceanic entry point.

## — Gross navigation errors (GNES)

- ▶ Fly the route received in the OCEANIC clearance – not the filed flight plan.
- ▶ A reclearance scenario is the prime cause for most navigational errors. Crews must ensure they correctly copy the RECLEARANCE, reprogram (and execute) the FMS (or Long Range Navigation System, LRNS), update the Master Computer Flight Plan (CFP) and update the plotting chart. The FMS crosschecks for the clearance should include distance and track checks between the new waypoints.  
*NOTE: Track and distance tables are available commercially for every ten degrees of longitude.*
- ▶ Crews must follow a RECLEARANCE (and not the filed flight plan). The captain should ensure that all flight crew members are aware of the details of the RECLEARANCE by briefing all non-flying crew members.
- ▶ Ground crosschecks of the Long Range Navigation System (LRNS) should include distance and track checks between waypoints. Enroute procedures must also include distance and track checks when passing a waypoint.
- ▶ The crosscheck of the FMS coordinates should include comparing the expanded coordinates against the flight plan.
- ▶ It is strongly recommended that a plotting chart be used and procedures include a position plot 10 minutes after each waypoint annotated with the coordinates and time of the plot. Compare all oceanic waypoints on the chart against the Master Computer Flight Plan (CFP).
- ▶ Standard Operating Procedures (SOPs) for LRNS must include independent clearance copy, data entry (Coordinates and/or waypoints), and independent crosschecks to verify that the clearance is correctly programmed. These procedures must also be used when enroute changes are entered. This task cannot be delegated.
- ▶ There should only be one CFP on the flight deck. It should be labeled the Master and should reflect the current cleared route of flight.
- ▶ Crews must be alert for similar sounding named oceanic boundary waypoints (e.g. PITAX versus BERUX) when receiving the ATC clearance.

## — Erosion of longitudinal separation

- ▶ Crews must communicate to ATC any ETAs that change by 3 minutes or more. This is an ICAO requirement and the information is used to modify ground-based ATC flight tracking systems.
- ▶ Crews must adhere to the assigned (True) Mach. Operators flying Long Range Cruise or ECON to conserve fuel are having a negative impact on the strict tolerance required for ATCs longitudinal separation.
- ▶ Crews should verify the accuracy of ETAs or ATAs (particularly the hour) forwarded to ATC to prevent an error of one hour.
- ▶ Crews must ensure they advise ATC in a timely manner of any change in their ETA for the oceanic entry point.
- ▶ Crews must ensure that the aircraft master clock (typically the FMS) is set using an approved calibrated time source to be used for all ETAs and ATAs.

## — Flight planning

- ▶ Dispatchers and Flight Planners must ensure the filed routes around the oceanic boundary do not include crossing multiple oceanic entry/exit points.
- ▶ Pilots must ensure they know current conditions to include NOTAMS (e.g. forecast turbulence in RVSM airspace) and weather documents (e.g. ETPs and alternate airports). In addition, pilots must be knowledgeable in the information on the computer flight plans and do basic crosschecks of fuel, winds and groundspeeds.

## Controller Pilot Data Link Communications (CPDLC)

- ▶ Conditional clearances require special attention. 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 scenario where a CPDLC conditional clearance was given to a crew. The crew subsequently failed to comply with the time restriction, but reported leaving its flight level, thereby enabling the controller to catch the error.

At approximately 1133Z a CPDLC message composed of the following uplink message elements (UM) was sent to the flight:

UM19 – MAINTAIN F370

UM21 – AT 1205 CLIMB TO AND MAINTAIN F380

UM128 – REPORT LEAVING F370

UM129 – REPORT LEVEL F380

The expected WILCO response was received by the OAC. At approximately 1134Z, a CPDLC message composed of the following downlink message element (DM) from the aircraft was received by the OAC:

DM28 – LEAVING F370.

The air traffic controller took immediate action to confirm the flight level and to issue a clearance via voice for the flight to expedite climb to a flight level that ensured vertical separation.

*NOTE: The receipt of the LEAVING F370 message enabled prompt action to correct this error.*

- ▶ Upon receipt of a CPDLC uplink message, it is important for both pilots to independently and silently read and verify the clearance.
- ▶ It is important to note that the CPDLC uplink message may be more than 1 page in length. Review the entire message carefully, in the correct order, before taking any action. It may be helpful to print the message.
- ▶ Both pilots should resolve any questions that they may have regarding the clearance with each other and if necessary with ATC prior to initiating any action. If unable to fully understand the CPDLC clearance, pilots should revert to backup voice communication.
- ▶ Pilots should not use voice to verify that an up-linked CPDLC message has been received or to inquire if a down-linked datalink message has been received by the ATS provider.
- ▶ Crews should be cautious with CPDLC clearances (message sets) that are delayed.
- ▶ Crews should be cautious with clearances when communicating via CPDLC and HF radio simultaneously. CPDLC is the primary communication means when it is operating. The clearance is received from that [CPDLC] source only.
- ▶ Crews should avoid using the free-text method.
- ▶ Crews should be sure that HF SELCAL is working even when CPDLC is functioning properly – do a SELCAL check prior to oceanic entry and at each Oceanic Control Area (OCA) boundary.

## General

- ▶ Dual checking of oceanic clearance MUST be SOP (avoid physiological breaks or distractions near the oceanic boundary or when copying and reprogramming enroute reclearances). Changes must be communicated clearly to non-flying flight crew members so that they understand RECLEARANCES when they relieve flying flight crew members.
- ▶ Radio operators relay for/to controllers. The majority of oceanic communications such as position reports or 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.
- ▶ The use of the terms “expect” or “able” by ATC is NOT a clearance. Typical phraseology is to use, “ATC clears....”
- ▶ 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 LRNS or the plotting chart first and then compare it to the master source (i.e. CFP). This is a human factor’s practice that could prevent the pilot from seeing what he/she expects to see.
- ▶ Crews must immediately clarify any confusion about the clearance.

## SLOP – Strategic Lateral Offset Procedures (RIGHT offsets only)

- ▶ Crews should be aware of this procedure for use in 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.
- ▶ Crews should be aware of the “coast-out to coast-in” operational use of the procedure.
- ▶ Crews should be aware of the three SLOP options: centerline, 1 NM RIGHT offset or 2 NM RIGHT offset. NOTE: Operators are reminded that the current SLOP was created to reduce the risk of collision. It was also designed to incorporate wake turbulence avoidance. SLOP enhances flight safety by reducing the risk not only from operational errors but also crews executing a contingency with a highly accurate LRNS.
- ▶ Offsets to the left of centerline are NOT authorized under SLOP and should not be flown.

## Contingencies

- ▶ The 15 NM lateral offset contingency procedure is now universal for ALL oceanic areas (formerly 30 NM in the NAT and 25 NM in the Pacific). Operators should update their ground training and manuals to reflect this change. Details of the 15 NM contingency procedure can be viewed in the NAT Doc 007 (click [here](#) to access) please refer to Section “Special Procedures”.
- ▶ The published Weather Deviation Procedure is now universal in all oceanic areas. 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. Details of the weather deviation procedure can be viewed in the NAT Doc 007 (click [here](#) to access) please refer to Section “Deviation Around Severe Weather”.

*Note: If the aircraft is required to deviate from track to avoid weather (e.g. thunderstorms), the pilot must request a revised clearance from ATC prior to deviating. Crews must not deviate laterally or vertically without attempting to obtain an ATC Clearance. However, if such prior ATC clearance cannot be obtained, pilots must follow published ICAO Weather Deviation Procedures*

- ▶ Crews are reminded to execute the correct contingency procedure in case of an emergency descent, turbulence, etc. It is important to minimize the risk to you and other aircraft.
- ▶ Crews should be aware that there is more than one contingency maneuver and should be familiar with the recommended procedure for each in-flight occurrence type.

## Additional Information

Click [here](#) for the *Sample Oceanic Checklist*

Click [here](#) for the IFALPA Briefing Leaflet *Strategic Lateral Offset Procedures*

Click [here](#) for the ICAO document *Guidance concerning Air Navigation in and above the NAT MNPS airspace*