

# Special Report: Oceanic Errors in the North Atlantic

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15 August, 2011

## Oceanic Errors in the North Atlantic/NAT Region

ICAO oversees a number of North Atlantic Working Groups comprised of industry, ATC and state regulators. These working groups regularly review the most 'popular' Oceanic Errors:

- **Large Height Deviations (300 feet or more)**
- **Gross Navigation Errors (25 NM or more)**
- **Loss of Longitudinal Separation.**

ICAO has published the following recommendations to reduce oceanic errors, that should be addressed in initial and recurrent ground training:

### LARGE HEIGHT DEVIATIONS

1. 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.
2. In oceanic, non radar RVSM airspace, during a climb or descent, crews **must** advise ATC when leaving and reaching a flight level.
3. 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.
4. Crews must ensure a CORRECT understanding of when a climb or descent should be initiated or completed.
5. 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.
  - 5.1. The following are examples of conditions or restrictions given to crews when the terms AT or BY are used in a conditional clearance.
6. Crews must be diligent in reviewing performance data for their particular aircraft, so as to avoid either requesting or accepting clearance to unrealistic flight levels which are outside of the performance envelope of the aircraft.

NOTE: Crews must carefully consider in their performance planning the significant temperature inversions that can frequently occur over the Atlantic Ocean. This is particularly important when aircraft are near to maximum gross weight and when attempting to comply with flight levels dictated at oceanic entry points.
7. **Crews should be aware that requesting unrealistic flight levels can seriously impact separation between their aircraft and other NAT traffic.** NOTE: If there has been a significant change affecting the aircraft weight after the flight plan has been computed, request a new flight plan. An example would be if you add a considerable amount of fuel to tanker through a location where the fuel cost is high.
8. 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.

9. 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.

10. 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.

11. 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)**

1. **Fly the route received in the OCEANIC clearance - not the filed flight plan.**

2. 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.

3. 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.

4. 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.

5. The crosscheck of the FMS coordinates should include comparing the expanded coordinates against the flight plan.

6. 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).

7. 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.

8. 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.

9. 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**

1. 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.

2. 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.

3. Crews should verify the accuracy of ETAs or ATAs (particularly the hour) forwarded to ATC to prevent an error of one hour.

4. Crews must ensure they advise ATC in a timely manner of any change in their ETA for the oceanic entry point.

5. 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**

1. Dispatchers and Flight Planners must ensure the filed routes around the oceanic boundary do not

include crossing multiple oceanic entry/exit points.

2. 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)**

1. 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 Oceanic Controller. At approximately 1134Z (ie. 31 minutes before it should have started the climb), 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.

2. Upon receipt of a CPDLC uplink message, it is important for both pilots to independently and silently read and verify the clearance.
3. 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.
4. 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.
5. 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.
6. Crews should be cautious with CPDLC clearances (message sets) that are delayed.
7. 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.
8. Crews should avoid using the free-text method.
9. 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.



2. 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. (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

3. 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.

4. 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 typee.

### **Recommended Reading!**

- Your primary source document for NAT Ops is “**NAT Doc 007: Guidance in and above the NAT/MNPS Airspace**”