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GABINETE DE PREVENÇÃO E INVESTIGAÇÃO DE ACIDENTES COM AERONAVES

AIRCRAFT INCIDENT SUMMARY REPORT

In accordance with Annex 13 to the International Civil Aviation Organisation Convention, Chicago 1944, Council Directive 94/56/EC, 21st NOV 1994, and article 11th nº 3 of Decree-Law nº 318/99, 11th AUG 1999, the sole purpose of this investigation is to prevent aviation accidents. It is not the purpose of any such accident investigation and the associated investigation report to apportion blame or liability.

Date/Time:	2010 / 04 / 04 @ 19:55 UTC ¹	Proc. Nr.:	03 / SUM / 2010
Operator:	Aer Lingus Teoranta	Type of Incid.:	ATM
Id. of aircraft: Airbus A-320, registration EI-DEK			
Local: NAVIX (Transition point from Lisbon CTA to Sta. Maria OCA)			
Type of flight:	Transport Passengers	Phase of flight:	Cruise
People on board:	Crew / Pax: unknown	Injuries:	Nil
Aircraft Damage: Nil			
Other Damage: Nil			
Synopsis: The aircraft was flying from Tenerife (TFS) to Belfast (BFS) and received, by datalink, an oceanic clearance for FL360. Approaching NAVIX point, Sta Maria oceanic control requested Lisbon ACC controller (Madeira sector) to ask EIN-843 if he could accept FL370, to which he answered affirmative and has been instructed to climb to that Flight Level. When the pilot contacted Sta Maria Radiotelephone, in order to confirm clearance changes, he was informed that his clearance was for FL360. While this misunderstanding was clarified between controllers, the aircraft was approaching entry point (NAVIX) and the Captain, being not allowed to descend to FL360, decided to enter a holding pattern, until the clearance became clarified.			

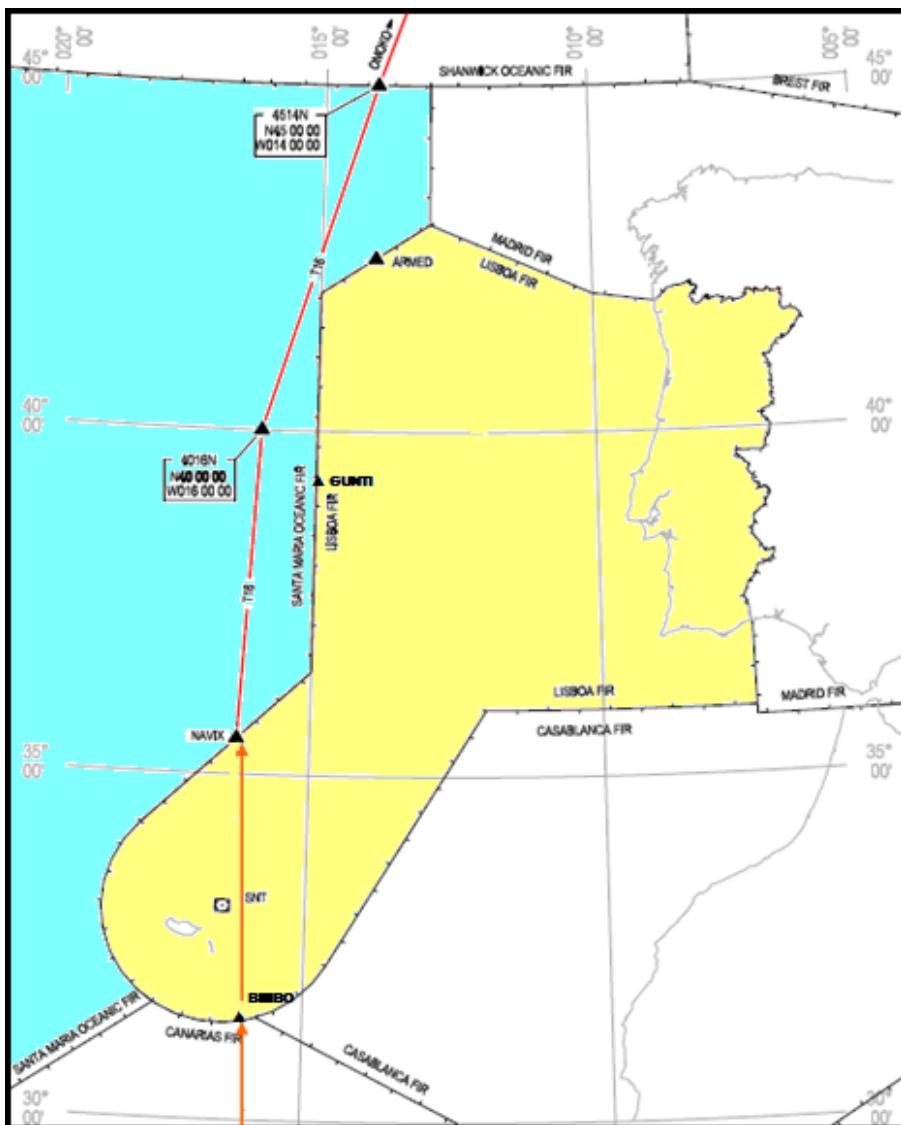


¹ - All times in this report, unless other specified, are UTC time (Universal Coordinated Time). By that date, local time in mainland Portugal and Madeira was equal to UTC + 1 hour, while in Azores local time was equal to UTC.

1. Factual Information

1.1 History of the Flight

Irish Company Air Lingus flight EIN-943 departed Tenerife (GCTS), in Canary Islands, with destination Belfast (EGAA), in Northern Ireland. Leaving Canary FIR, through "BIMBO" point, the flight would overfly airspace controlled by Lisbon ACC Madeira sector (CONLIS) and Atlantic control of Sta Maria (CONTATL), following the route (*orange*) signalled on the map (*picture nr 1*).



Picture Nr 1

Departing from GCTS, by 18:53, the flight received, via Datalink, oceanic clearance issued by CONTATL, for the route:

"....NAVIX – 40N016W – 45N014W – OMOKO - FL360 - Mach 0.79...."

Once the aircraft had to cross Lisbon FIR, the same clearance was transmitted (by 18:52) to Madeira sector CONLIS controller, for coordination.

At 19:48:31, the aircraft still 47NM to NAVIX (*picture nr 2*), Sta Maria controller (ATCO SMA) called Madeira sector controller (ATCO LIS) asking him to contact EIN-943 in order to know if he could accept FL370, because the flight would be crossing with MEDIC-01, who was to be cleared to cruise at FL360 and there was no guarantee, at the moment, that a horizontal conflict would be avoided.



Picture Nr 2

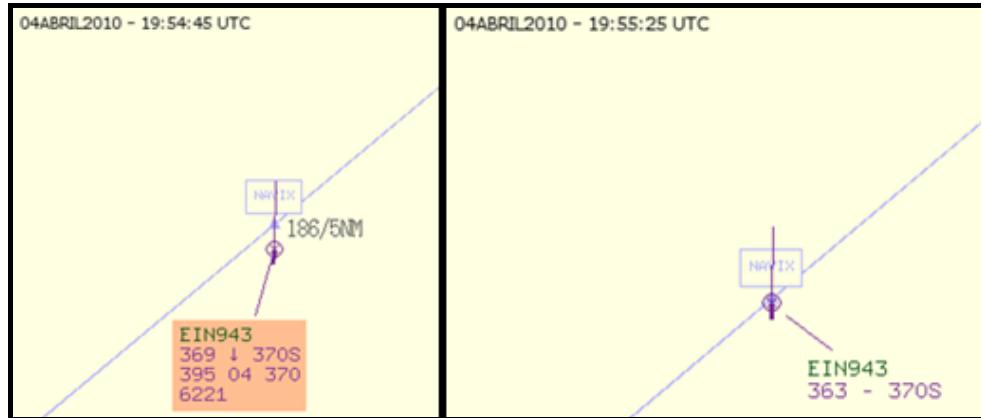
Flight EIN-943 accepted the proposal and he was instructed by ATCO LIS (19:48:32) to climb and maintain FL370, being ATCO SMA informed of such change and reminded to update the oceanic clearance delivered for that flight.

At 19:51:33 ATCO SMA informed the Radiotelephone of clearance change, being that message received by a Radiotelephone Operator (*TICA 1*).

About 20NM before NAVIX, EIN-943 asked ATCO LIS (19:51:41) if he had his oceanic clearance update or if he must request it from Sta Maria, by himself, to what ATCO LIS replied it was better the pilot to contact directly with Sta Maria, providing Radiotelephone HF frequencies to be used.

At 19:53:08, in contact with Radiotelephone on 5598kHz, EIN-943 was informed by *TICA 2* that his clearance was for FL360, insisting on that level against pilot request for confirmation of cleared FL.

Back in contact with ATCO LIS (19:54:37) EIN-943 informed his oceanic clearance was for FL360 and, as he was approaching entry point, he was descending to FL360. ATCO LIS informed he was "seeing" (on radar) traffic at FL360 and instructed EIN-943 to return to FL370, while trying to clarify the situation with ATCO SMA. EIN-943 replied *he would not enter OCA without being cleared for that level and he was starting a hold at NAVIX, returning to FL370*, giving time for the situation to be clarified (picture nr 3).



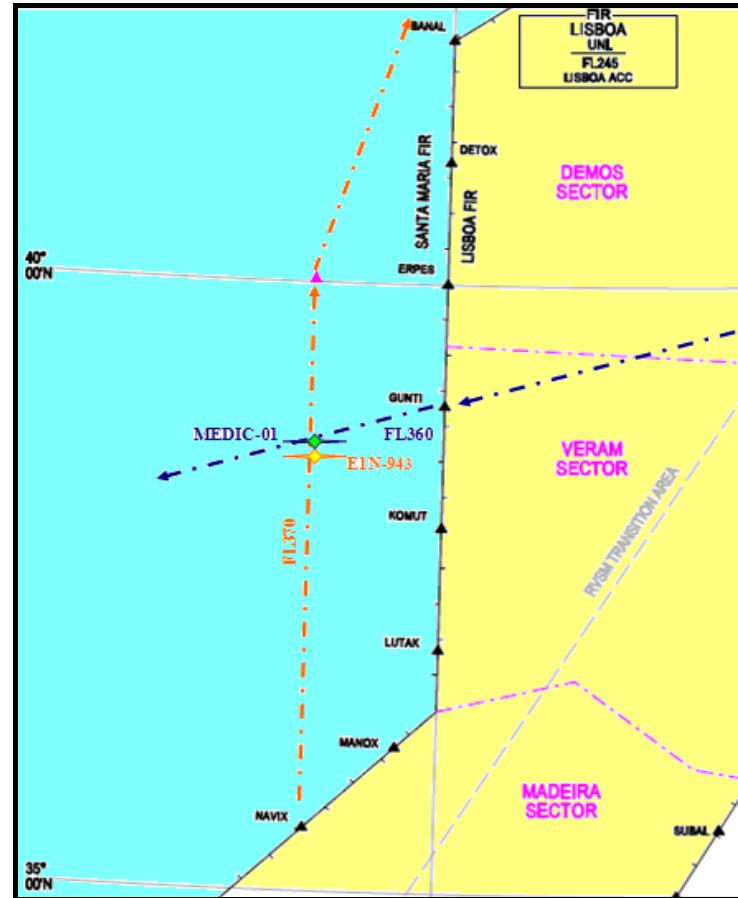
Picture Nr 3

EIN-943 initiated a right turn and, only by 19:57, after receiving a new clearance for FL370, resumed navigation to next point ($40^{\circ}\text{N } 016^{\circ}\text{W}$), exiting holding after 45° turn.

As there was a deviation to the right of track, the aircraft has been established on an offset course, 2NM to the right of central line, until next reporting point $40^{\circ}\text{N } 016^{\circ}\text{W}$.

Before this position was attained ($\pm 80\text{NM}$ before). EIN-943 got a TCAS/TA, with traffic crossing from his right to his left, 1000ft bellow and 2NM ahead (picture nr 4).

It was MEDIC-01 from GUNTI to $38^{\circ}\text{N } 020^{\circ}\text{W}$, at FL360, the same that originated Flight Level change proposal, issued by CONTATL.



Picture Nr 4

1.2 Clearance Procedures in Sta Maria Oceanic Control Area

Herein please find AIP Portugal referred procedures for intended flights in Sta Maria OCA (AMDT - AIRAC 003/2010, effective entry date 11-03-2010).

1.1.9 OCEANIC CLEARANCES PROCEDURES IN SANTA MARIA FIR

1.1.9.1 General:

All flights entering the NAT Region through Santa Maria Oceanic Control Area must obtain ATC clearance before crossing the Oceanic Control Area boundary. Oceanic Clearances may be request on voice (HF and VHF) or via the appropriate data link services.

Pilots should always endeavour to obtain Oceanic Clearance prior to entering Santa Maria Oceanic Control Area; however if any difficulty is encountered the pilot should not hold while awaiting Clearance unless so directed by ATC.

Flights from Lisboa shall inform Lisboa ACC of the flight level and entry point in the NAT Region, as contained in the Oceanic Clearance.

All Pilots are reminded that the Oceanic Clearance is valid only from Santa Maria's FIR boundary. In order to comply with the Oceanic Clearance if any route, speed or level change is required before to the entry boundary point, it is mandatory to make a prior request with the Control Centre in charge of their flight.

Pilots are reminded that while outside of Santa Maria FIR and whilst in contact with Santa Maria Radio, it is mandatory to maintain two way communications with the Control Centre in charge of their flight.

Those flights which use Data Link Services for Oceanic Clearance Request and Reception, must establish voice contact with Santa Maria Radio for SELCAL Check on appropriate HF frequencies or on VHF 132.075 MHZ (AIP Portugal ENR 2.1.18 and ENR 2.1.21 refers), prior entering Santa Maria FIR.

1.1.9.2 Adherence to Oceanic Clearance

As a Key part of ensuring the overall safety in the NAR Region, Pilots are reminded of the importance of strict adherence to the Oceanic Clearance. The NAT Oceanic Clearance provides separation from all known aircraft from the Oceanic Entry Point to the Oceanic Exit Point. This separation can only be assured if all aircraft enter Oceanic Airspace in accordance with their Oceanic Clearance.

Although it may be desirable to defer climb or descent to the cleared oceanic flight level, delaying the request to Domestic ATC for a clearance may result in entering Oceanic Airspace at an incorrect flight level. This has an extremely negative impact on the overall safety situation.

In practical terms:

1. Flights must enter Oceanic Airspace Level at the cleared oceanic flight level;
2. Flights must enter Oceanic Airspace at the cleared oceanic Entry Point;
3. Flights must maintain the assigned true Mach Number;
4. If a Pilot can not comply with any part of the Oceanic Clearance, ATC must be informed immediately;
5. Pilots must ensure that their aircraft performance enables them to maintain the cleared Oceanic Flight Level for the entire oceanic crossing;
6. If a Pilot discovers that the aircraft is not able to reach or remain at a cleared flight level, ATC must be informed immediately.

1.1.9.3 Requests for Oceanic clearance

1.1.9.3.1 Flights entering the NAT Region through Santa Maria OACC

All operators should request their Oceanic Clearance from Santa Maria OACC, through Santa Maria Radio, on appropriate HF frequencies or on VHF 132.075MHZ (AIP Portugal (ENR 2.1-18 refers) or through the appropriate data link services, at least 40 minutes before the ETO for the NAT Region boundary.

Departures from Aerodromes situated close to the NAT Region Boundary shall request Oceanic Clearance as soon as possible after departure.

All flights shall carefully monitor the estimate for the OCA entry point (AIP-Portugal ENR 1-1-3- Oceanic Clearance Request - RCL) as the non-compliance with applicable ICAO provisions may result in re-clearance to a less economical flight profile.

1.1.9.3.2 Flights Departing from Azores

1.1.9.4 Delivery of Oceanic Clearances

1.1.9.4.1 General

The reply to an Oceanic Clearance request made through data link will normally be made also via data link. Whenever a problem or doubt arises, the Oceanic Clearance will be issued or confirmed via voice.

1.1.9.4.2 Oceanic clearance delivery for aircraft in NAT tracks

1.1.11.8 OCD

The OCD is a data link service that allows pilots and controllers to exchange text messages for Oceanic Clearance Request and Oceanic Clearance Delivery using the ACARS network, according the specifications defined on the AEEC 623 and EUROCAE ED 106.

If any failure is detected on this service, pilots and controllers shall revert to voice procedures.

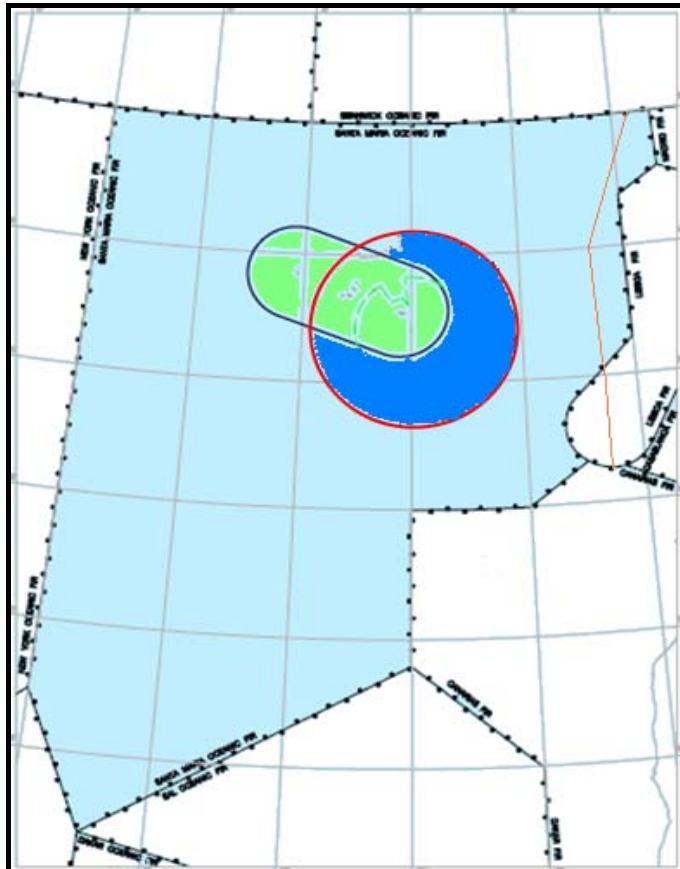
Note: Highlights are author's responsibility.

1.3 Communications in Sta Maria Oceanic Control Area

Due its extension, radar coverage and VHF communications are not possible in the entire Sta Maria OCA, being HF frequency the primary mean of two-way radio control communication.

This type of control relies on Radiotelephone transmissions between pilots and Aeronautical Communication & Information Technicians (TICA), with the later relaying with Air Traffic Controllers (ATCO) by phone or using computerized information available.

There is no direct link between pilots and controllers.



Picture Nr 5

Additionally, there's a small area where radar coverage is available (*dark blue area, in picture nr 5, represents radar coverage – about 250NM radius at FL300 with centre in Sta Maria*) and VHF radio communications and effective control becomes possible, with pilots talking directly with controllers.

Recently a new Datalink Service has been implemented and it may replace some voice communications by data transmission, even allowing the pilots to dialogue with controllers by mean of written messages (CPDLC), when the aircraft is equipped with this features.

1.4 ATM Coordination Links

Coordination between ATM units (*ground to ground*) is usually granted by telephone, being it the most suitable and reliable mean for long distance communication.

CONTATL Controller (ATCO SMA) used the telephone to contact with CONLIS Controller (ATCO LIS) in order to coordinate and request the aircraft capability for FL370.

Communication between CONTATL and Radiotelephone (*TICA*) is usually done by telephone, especially when a priority message related to an update to an oceanic clearance already issued to the aircraft is involved. In other cases oceanic clearances may be available on computer display, linked to SMA ACC internal network.

ATCO SMA used the telephone to transmit alteration to EIN-943 oceanic clearance to TICA 1. Neither of them registered such change on computer or any other available support that could be reached by others.

Aircrafts use radio communications to contact with ground, being it VHF or HF frequencies, depending on coverage. Those equipped with data link communication facility may use written messages to contact with controllers, with HF radio as standby.

EIN-943 requested and received oceanic clearance through Datalink (*OCD*), but was not equipped in order to maintain a dialog through CPDLC, contacting ATCO LIS via VHF and TICA 2 by HF radios.

2. Analysis

2.1 EIN-943 Procedures

Pilot requested Oceanic clearance via ACARS, prior to departure from GCTS, using OCD data link and a clearance was issued and delivered to him by the same link (as per AIP 1.1.9.1 and 1.1.11.8).

EIN-943 was not equipped in order to use CPDLC facility but only capable of receiving Oceanic Clearance Delivery (OCD), through ACARS. All other communications with Sta Maria should be done through Radiotelephone, on HF frequencies.

When asked by ATCO LIS if he could accept FL370, he answered affirmatively and he was cleared to climb to and maintain FL370, still in Lisbon CTA.

Before entering Sta Maria OCA he asked the controller if there was an amended clearance issued or if he must contact directly with Sta. Maria, being informed to contact with Sta. Maria on 5598kHz, which he did with TICA 2.

TICA 2 informed EIN-943 that the flight was **cleared to enter SMA OCA, by NAVIX, flying to 40°N 016°W, 45°N 014°W, OMOKO, maintaining FL360 and Mach Number .79**, maintaining FL360 even after the pilot insisting to confirm that level.

In order to adhere to the requirements specified in AIP Portugal 1.1.9.2, the pilot decided to descend to FL360, to be levelled by NAVIX, for what he informed ATCO LIS as he was still flying inside Lisbon CTA.

Being advised by ATCO LIS to regain FL370 he assumed that, to comply with AIP 1.1.9.2, should hold at NAVIX until an amended clearance was issued, forgetting note on second paragraph of AIP 1.1.9.1, which recommended to **not hold while awaiting clearance, unless so directed by ATC**, once there was not a case of waiting for clearance but a disagreement between clearances passed to him by two different ATM offices.

There is no specific information, on Portuguese AIP 1.1.9 or any other chapter, which can help to solve such situation.

- ◆ The flight could not enter at last assigned flight level (*FL370*);
- ◆ The flight was not allowed to descend to oceanic cleared flight level (*FL360*);
- ◆ The flight could not hold;
- ◆ **The flight could not be freezed in the sky.**

So, what more could be done by the crew?

2.2 ATM Units Coordination Procedures

When Sta. Maria receive MEDIC-01 request for FL360 approval, there was no sufficient information to calculate proximity risk with EIN-943, which route would be crossed. In doubt, ATCO SMA opted for a level change proposal to EIN-943.

Once the flight was operating in Madeira sector of Lisbon CTA, CONTATL Controller (ATCO SMA) used the telephone to contact with CONLIS Controller (ATCO LIS) in order to request the aircraft capability for FL370 and, obtained the consent, coordinate climb to new FL370.

After ATCO LIS reminding, ATCO SMA used the telephone (*being it an urgent message involving a change to a previous issued clearance*) to contact Radiotelephone Operator (TICA 1) and passed the change to EIN-943 oceanic clearance (19:51:33 to 19:51:59).

None of them registered the new clearance on computer Database or by any other mean.

No clearance update message was sent to the aircraft, by OCD or CPDLC (*not available*).

2.3 Consequences

When EIN-943 requested confirmation of his clearance (19:53:08), TICA 2 (*who took over from TICA 1*) was unaware of any change and passed to him the ancient clearance, as it has been transmitted by OCD, insisting the cleared flight level was FL360.

Facing this, the pilot informed ATCO LIS that he was descending to FL360, in order to be levelled by NAVIX. Requested to maintain FL370, he replied that he should enter a holding until the situation was clarified.

Reaching NAVIX the aircraft entered a right turn holding pattern.

Under insistence of ATCO LIS with ACTO SMA, the later re-established contact with TICA 2 and a revised clearance was transmitted (19:56:30) to the aircraft by both (*ATCO LIS and TICA 2*).

Once cleared to fly the oceanic route at FL370, EIN-943 executed a left turn (*after an initial 45° right turn*) and proceeded to next waypoint (40°N 016°W), flying an offset track (2NM *right of centre line*).

There was no traffic, in the vicinity of NAVIX point, which could have been affected by the manoeuvre and so there was no separation problems.

When approaching 40°N, EIN-943 had a TCAS/TA due MEDIC-01 crossing 2NM in front and 1000ft below (FL360).

All remaining flight in Sta Maria OCA was uneventful.

3. Conclusions

3.1 Findings

- 1st Flight EIN-943 received, via Datalink, an ATC clearance to fly through Sta Maria Oceanic Control Area, from NAVIX to OMOKO, passing 40°N 016W, 45°N 014°W, maintaining FL360 and cruising speed of Mach 0.79M;
- 2nd Before entering Sta Maria OCA, PIC was asked if he could accept FL370, to which he answered affirmative, being instructed, by Lisbon Controller, to climb to and maintain FL370;
- 3rd Lisbon Controller informed Sta Maria Controller that the flight was climbing to FL370 and reminded him to inform Radiotelephone Operator, in order to update respective oceanic clearance;
- 4th Sta Maria Controller acknowledged that change and contacted Radiotelephone Operator, by phone, informing level change and suggesting clearance update, but never sent a message to the aircraft, via Datalink;
- 5th When EIN-943 contacted Sta Maria Radiotelephone Operator, for clearance confirmation, he was informed that his flight was cleared for FL360 and not FL370;
- 6th Back with Lisbon Controller, pilot informed his clearance was for FL360 and, as he was approaching NAVIX, he should descend to FL360, leaving FL370 by that moment;
- 7th Requested, by Lisbon Controller, to keep FL370, the pilot informed he would hold at NAVIX until the situation could be clarified;
- 8th Miscoordination was clarified in a few seconds and the flight proceeded on its assigned route, after a new oceanic clearance has been confirmed by Lisbon Controller and Sta Maria Radiotelephone Operator;
- 9th In any phase of this process a lack of separation or any other traffic problem arose.

3.2 Causes of the Incident

The incident was due to a miscoordination between Sta Maria Atlantic Control Centre Controller and Sta Maria Radiotelephone Operator. In spite of being passed the message for clearance change, the lack of procedures contributed for the change not to be registered and, when there was a TICA change, the new one didn't know about it and considered the first clearance issued (*the only one he could retrieve*) was the valid one.

4. Preventive Action Proposals

Once it was detected a coordination deficiency between Air Traffic Controllers and Radiotelephone Operators in Santa Maria Atlantic Control Centre;

Considering that the crew was faced with two different clearances for the same route sector and there was no mean to ascertain which of them should be followed, as AIP Portugal referred procedures are not clear enough to deal with such situation;

Admitting that PIC decision to hold at NAVIX was not in line with AIP Portugal § 1.1.9.1 recommendation, but all other procedures have been followed and there was no assigned procedure for similar situation (*failure to amend ancient clearance or miscoordination*);

Because it is impossible for an aircraft to freeze its position in flight;

Considering that similar miscoordination may endanger the safety of air navigation and, in other circumstances, could create a traffic separation conflict;

It's suggested:

To NAV-PORTUGAL, E.P.E.,

1st. *“To try to improve coordination between Controllers and Radiotelephone Operators and create procedures for clearance change’s communication and registry, in order to provide an immediate update and void all old versions, so only the current clearances are available, at any moment, for all personnel in contact with the aircraft.”* (PAP Nr 11/2010)

2nd. *“To promote a serious revision study of AIP Portugal 1.1.9 chapter and issue clear procedures to be followed in situations like this, when there are conflicting clearances, avoiding the progress of an aircraft when reaching an entry point in Sta Maria OCA and at same time impeding it to enter a hold.”* (PAP Nr 12/2010)

Lisbon, 20th of August, 2010

The Investigator In Charge,



A. A. Alves

GLOSSARY

The expressions, abbreviations and acronyms, herein referred and used in this report, have the following meanings:

ACARS	Aircraft Communication Addressing & Reporting System
ACC	Area Control Centre
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
BFS	Belfast Aldergrove (IATA designation)
CON	Control
CONTATL	Atlantic Control
CONLIS	Lisbon Control
CPDLC	Controller Pilot Data Link Communication
CTA	Traffic Control Area
EGAA	Belfast Aldergrove (ICAO designation)
FIR	Flight Information Region
FL	Flight Level
GCTS	Tenerife South (ICAO designation)
HF	High Frequency
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
kHz	kiloHertz
LIS	Lisbon (IATA designation)
M	Mach
N	North
NM	Nautical Miles
OCA	Oceanic Control Area
OCD	Oceanic Clearance Delivery
PIC	Pilot In Command
SMA	Sta Maria (IATA designation)
TA	Traffic Alert
TCAS	Traffic Alert & Collision Avoidance System
TICA	Aeronautical Information and Communications Technician
TSF	Tenerife South (IATA designation)
UTC	Universal Time Coordinated
VHF	Very High Frequency
W	West