DATA SUMMARY

LOCATION

Date and time	**Tuesday, 10 October 2006; 22:15 local time**
Site	**Seville Airport**

AIRCRAFT

Registration	**EC-GRF**
Type and model	**AIRBUS A-320-211**
Operator	**Clickair**

Engines

Type and model	**CFM56-5-A1**
Number	**2**

CREW

	Pilot in command	Copilot
Age	**60 years**	**32 years**
Licence	**ATPL(A)**	**ATPL(A)**
Total flight hours	**13,450 h**	**3,100 h**
Flight hours on the type	**4,300 h**	**2,800 h**

INJURIES

	Fatal	Serious	Minor/None
Crew			**6**
Passengers			**163**
Third persons			

DAMAGE

Aircraft	**None**
Third parties	**None**

FLIGHT DATA

Operation	**Commercial air transport – Scheduled – Domestic – Passenger**
Phase of flight	**En route and taxiing**

REPORT

Date of approval	**18 December 2007**

1. FACTUAL INFORMATION

1.1. History of the flight

On Tuesday, 10 October 2006, aircraft EC-GRF, operated by Clickair, experienced two flames in the right engine´s exhaust nozzle, one mid-flight at 21:41:32, and the other on the ground at 22:15:49 after landing at Seville Airport.

The A-320-211 aircraft with call sign CLI1011 had taken off with a pilot and copilot, 4 cabin crew and 163 passengers aboard on a flight from Barcelona to Seville. After taking off from Barcelona Airport at 20:56:57, the aircraft climbed on a course of 230°-235° to FL350, flying over Valencia until it reached reporting point ASTRO. Once at ASTRO, the aircraft increased its heading to 248º after being cleared through to ROTEX, IAF for the instrument approach to runway 27 at Seville airport. Eleven minutes after passing through ASTRO, with the aircraft steady on course at FL350, some of the passengers and a cabin crew member saw a flame on the right side of the aircraft which they thought to be a fire. The cockpit crew felt an explosion and a slight shudder and the electronic centralized aircraft monitoring (ECAM) system registered a momentary increase in number 2 engine's exhaust gas temperature (EGT) and low pressure compressor rotor rpm's (N1) above the maximum allowable. After setting the throttle to idle, all engine parameters stayed within normal limits, which led the pilots to believe the compressor had stalled, as they reported to ATC.

After obtaining ATC clearance, the aircraft initiated its descent, continuing its flight to Seville as planned. Thirty-two minutes elapsed between the mid-flight explosion and the landing in Seville. At 22:15:49, 1 minute and 42 seconds after touching down, while the aircraft was on taxiway T-2 with both engines at idle, there was a second explosion, along with a flame and a vibration. The crew stopped the aircraft and proceeded to stop both engines. Seconds after stopping the right engine, FA-2 informed the captain that she had deployed the left rear slide, even though the left engine was still running and no evacuation had been ordered by the pilot.

At no time was an emergency declared, though following the initial incident the captain twice informed ATC that he had had a problem with one of the engines but was not declaring an emergency.

The passengers were disembarked while on taxiway T-2 via the front and left rear stairs once the deployed slide had been removed. Firefighters did not apply any agents to the engine.

1.2. Injuries to persons

None of the 169 people aboard were injured during the incident or subsequent evacuation at Seville Airport. Airport medical services treated one passenger for anxiety and back pain.

Injuries	Crew	Passengers	Total	Third persons
Fatal				
Serious				
Minor				Not applicable
None	6	163	169	Not applicable
TOTAL	**6**	**163**	**169**	

Table 1. Injuries to persons

1.3. Damage to aircraft

The aircraft was not damaged during the incident, nor did it show visible signs of fire, smoke or heating from the outside following the explosions. During its disassembly it was noticed that the deflated slide deployed at the left rear door was punctured.

1.4. Personnel information

1.4.1. *Pilot information*

The pilot, seated in the LH seat, was 60 years old and Portuguese. At the time of the incident he had a valid airline transport pilot license, obtained in Portugal. He had valid A-320, A-330, A-340, multiengine aircraft and A-330 instructor ratings. He had received his last class 1 medical certificate in Spain in March of 2006 and it was valid at the time of the incident.

He had a total of 13,450 flight hours, 4,300 on the type. It was his third flight with this company and his second with the copilot.

1.4.2. *Copilot information*

The copilot, seated in the RH seat, was 32 years old and Portuguese. At the time of the incident he had a valid airline transport pilot license, obtained in Portugal. He had A-320, A-330 and A-340 ratings as copilot and a multiengine rating. His last class 1 medical certificate had been issued in Spain in April of 2006 and was valid at the time of the incident.

His total experience consisted of 3,100 flying hours, 2,800 of them on the type. He had been working for the company for one week and it was his third day on the job.

1.4.3. *Information on the flight attendants*

FA-1, the purser, a 34-year-old Spanish national, was seated in the front left part of the aircraft. She was licensed as a flight attendant on the A-320 and had a valid class 2 medical certificate. In her recent experience at other companies she had worked as a purser since June of 2006. According to her statement, she had 4,000 flying hours, 900 of them on the type. She had been working for Clickair since 28 September 2006.

FA-2, a 27-year-old Spanish national, was in the rear left of the aircraft. She had a valid FA license and class 2 medical certificate. The A-320 rating was not listed on her license, though she stated that she had had it for a long time and that she had worked as a FA in several Spanish companies, totaling 2000 flying hours, about 500 of them on the A-320. She had been a Clickair employee since 1 October 2006.

FA-3, a 27-year-old Spanish national, was in the right rear seat of the aircraft. She had a FA license and type 2 medical certificate. Her license did not list an A-320 rating. According to her statement, she obtained her A-320 rating in September of 2006. Her total experience consisted of 60 hours on the A-320 with Clickair, which had hired her on 1 October 2006.

FA-4, a 26-year-old Spanish national, was in the right front of the aircraft, next to FA-1. She had a FA license with an A-320 rating, obtained in September of 2006, and a valid class 2 medical certificate. She had accumulated a total of 30 flying hours, all aboard the A-320 and with Clickair, where she had been working since 1 October 2006.

Between 28 August and 1 September, all the FAs had attended the operator's orientation program:

- Introduction to the company.
- Hazardous materials.
- Aviation medicine and first aid.
- CRM.
- In-flight safety.
- Rescue (slide and fire) and pool training.

1.5. Aircraft information

1.5.1. *General information*

The aircraft, an Airbus A-320-211, S/N 136, was manufactured in 1990 and registered in Spain in 1998. It was operated by Clickair.

The aircraft had all necessary certificates, licenses and insurance at the time of the incident. The aircraft's airworthiness certificate had been renewed on 22 September 2006, and the right engine, a CFM 56-5A1, S/N 731316, had been installed on 8 August 2006. The engine had a total of 27,526 hours.

The aircraft, fitted with two CFM 56-5A1 engines, featured capacity for a total of 180 passengers. There are four doors in the passenger compartment (figure 1) for boarding and deplaning, and four emergency exits above the wings. There is an evacuation slide at each access door. Two slides, one on each wing, are provided for emergency evacuations.

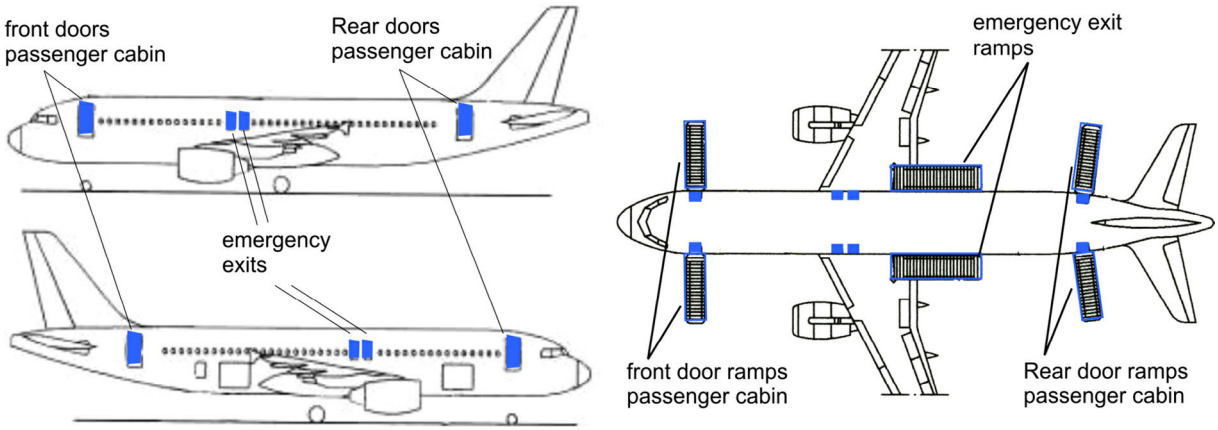

Figure 1. Passenger cabin exits and slides

1.5.2. *Post-incident inspections*

The right engine was inspected following the incident. There were no metallic particles in the exhaust and a borescope inspection showed damage in the high pressure compressor and turbine, the low pressure turbine and the combustion chamber, though unrelated to the incident.

The FDR data (section 1.6) indicated that the events of the incident resulted from an increase in the fuel flow inconsistent with the throttle input in the cockpit, which led to an inspection of the components associated with fuel control: the electronic control unit (ECU) and the hydromechanical unit (HMU).

Each engine is equipped with a FADEC (Full Authority Digital Engine Control) system which controls and calculates the fuel flow needed to maintain the low pressure compressor rotor (N1) rpm's selected by the throttle or by the autothrust system. The FADEC consists of a two-channel ECU, channels A and B, one in operation and the other in standby. Each channel receives critical engine signals from separate sources

(redundant sensors). Upon engine startup, when the power up test is performed, the channel that was in stand-by during the previous engine run or the "healthiest" channel goes into operation without its identity being logged. Even though one channel is in operation and the other in standby, data is exchanged internally between them in such a way that if a failure of the in-service channel is detected, the other has up-to-date data from each engine's sensors upon becoming operational. When only one sensor fails, the channel in control takes the data from the other sensor and the fault is logged by the ECAM.

The ECU controls the HMU, which uses a set of servo valves, torque motors and actuators to effect the ECU commands for the engine. One of the servo valves in the HMU regulates the fuel flow (FMV) and transforms the ECU commands into fuel flow at the combustion chamber injectors.

The FMV is hydraulically actuated with fuel via its associated servo valve and torque motor (FMV SV/TM). The torque motor has two independent coils, one for channel A and one for channel B. There are also two position resolvers, one for each ECU channel, which relay FMV position information. The positions of the FMV SV/TM commanded by the ECU are thus conditioned by the actual position of the FMV (close loop control). The electrical connections associated with the FMV are labeled as J7 for the A channel and J8 for the B channel. The purpose of the wiring is to relay the signals to the corresponding channel from the ECU to the FMV resolver and FMV TM, and to update the ECU with the FMV position resolver data.

Post-flight report

The ECAM post-flight report (PFR) logged three fault messages. The first took place 10 minutes before the first event and involved a fault in one of the channel A sensors, specifically in the fuel metering valve for the right engine. The next two fault messages took place during the first event and were associated with a high exhaust gas temperature (EGT) and an overspeed of the low pressure rotor (N1) in the right engine. An ECAM message was associated with these last two.

1931 ATA : 770000 1934 Source : EIU2FADEC Class : - Ident :
06 MAINTENANCE STATUS ENG 2 FADEC 06 732150 J7, HMU(FMV TM), ECU ENG2A

1941 ATA : 770000
06 ENG 2 EGT OVER LIMIT

1941 ATA : 770000
06 ENG 2 N1 OVER LIMIT

Figure 2. PFR fault messages (the PFR uses UTC time)

ECU inspection

The non-volatile memory in the ECU had recorded a dual channel FMV resolver fault on October 5th and October 9th and a single channel FMV torque motor fault on October 6th, faults of which the operator had no knowledge. The system is designed to record these faults as class 1 failure, and therefore, with indications to the flight crew (warnings or cautions on the lower ECAM display, flags, local warnings and "STS" box in the upper ECAM display). Apart from the indications to the flight crew, these faults are expected to be present on the post flight report. Moments before the flame, the ECU recorded a channel A fault for the FMV torque motor and a channel A fault for the FMV resolver. No problems with the ECU were recorded during the incident.

Since the functional tests done on the ECU did not indicate any discrepancies, this component was ruled out as the cause of the incident.

HMU inspection

The HMU was sent to the manufacturer for operational tests, disassembly and inspection. One of the pins in the resolver, pin n° 18, associated with channel A, was not seated properly in the connector and with little effort it would disengage and slide back through the connector. The tests done on the HMU in its "as was" condition following the incident showed that the resolver´s channel A did not work. Once the pin was correctly installed, the functional tests were performed with satisfactory results.

The tests done on the FMV torque motor did not show any discrepancies. All the HMU servo valves and actuators were inspected. Any associated internal cabling problems or malfunctions were ruled out.

When the HMU manufacturer received said unit for inspection, it implemented Service Bulletin 73-0151, issued in 2000, whose implementation was left to the operator's discretion. This bulletin dealt with the installation of new resolvers and torque motors.

According to the engine manufacturer, there are no prior incidents involving spurious HMU faults or any other case similar to that experienced by aircraft EC-GRF.

Inspection of the electrical connections

The electrical connections for both channel A (J7) and B (J8) of the FMV were inspected and shown to be in good condition.

Engine manufacturer's conclusions

Considering the results of the ECU and HMU inspections, which confirmed a fault in channel A of the resolver but noted no problems with the FMV SV/TM, the engine manufacturer noted, but did not confirm, the possibility of a double fault in FMV position resolvers channels A and B, similar to the events recorded by the ECU in the five days preceding the incident. In which case the manufacturer is unable to explain why the channel B FMV resolver fault was not recorded.

Both the engine and aircraft manufacturer are considering updating the Trouble Shooting Manual so as to include some proactive measures which, depending on the presence of previous faults in both channels of the fuel metering valve, will prevent future operational faults.

1.6. Flight recorders

ATC communications and FDR and CVR data have allowed for a reconstruction of the flight path taken by the aircraft and to identify the time and place where the sequence of events and communications took place during the flight.

It is not known which ATC communications correspond with Seville TWR. The only communications available were those recorded on the CVR.

The FDR started recording at 19:57:46, one hour before the takeoff run, and finished at 22:20:05, five minutes after the second event. The CVR lasted for 33 minutes and 34 seconds and recorded the cockpit conversations from 21:52:55, eleven minutes after the first event, until 22:26:29.

Figure 3 shows the route followed by aircraft EC-GRF, the times at which each point in the plan was passed, and the time at which the two events took place.

The below description of the flight of aircraft EC-GRF includes communications relevant to the incident, both between the crew and with ATC. The time used is local time at the ATC center in question.

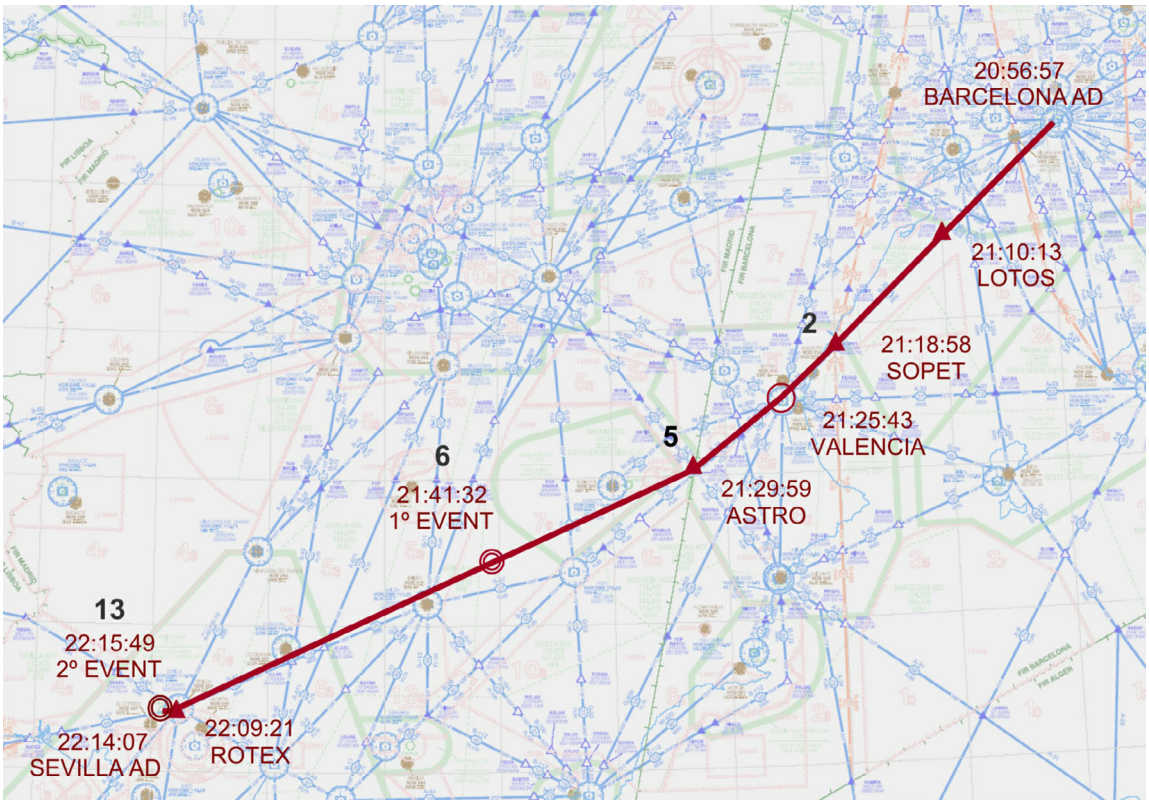

Figure 3. Flight path of aircraft EC-GRF

19:57:46 Start of the FDR recording.
20:56:57 Start of the takeoff run.
20:57:41 Takeoff and subsequent climb to FL350.
21:10:41 Heading 230° and climbing (1 in figure 4).
21:18:29 At FL350 with the aircraft near reporting point SOPET (2 in figures 3 and 4).
21:24:26 Heading 235° (3 in figure 4).
21:25:24 ATC clearance to reporting point ASTRO, maintaining FL350 through to ROTEX.
21:26:05 First anomalies appear in the right engine fuel flow with the aircraft stable at FL350 on a heading of 235°. The fuel flow in both engines until now had been similar, with an average value of 2,800 lb/hr, though from now until the first event, the fuel flow in the right engine fluctuates between 2100 and 3,788 lb/hr (4 in figure 4).
21:30:11 Heading 248° after going through ASTRO (5 in figures 3 and 4).
21:41:28 **1st event:** high pressure fuel valve for right engine cuts flow for one second. The aircraft is at FL350 on a heading of 248° and 140 NM away from Seville (6 in figures 3 and 4).
21:41:29 **1st event:** zero fuel flow for one second (6 in figures 3 and 4).
21:41:32 **1st event:** maximum fuel flow at 13,656 lb/hr (6 in figures 3 and 4).
21:41:34 **1st event:** right engine throttle set to idle and fuel flow reduced to 1856 lb/hr (6 in figures 3 and 4).

21:41:38 **1st event:** 12,888 lb/hr fuel flow to the right engine with the throttle at idle, along with right engine EGT of 1,006 °C and N1 of 117% (6 in figures 3 and 4).
21:42:42 The left engine throttle is set to maximum continuous thrust.
21:43:12 ATC notified of the first event: "Ok, we may have a problem."
21:43:23 First descent segment initiated from FL 350 to FL 170 at a descent rate of 1,656 fpm (7 in figure 4).
21:46:32 Left engine throttle set to idle. The right engine had been at idle since the initial event.
21:52:55 Start point of the CVR recording.
21:54:04 Left engine throttle increased, followed by the right (8 in figure 4). This coincided with a second descent leg from FL 170 to FL 130 at a descent rate of 564 fpm, less than before.
21:54:21 Copilot holds a conversation with the purser in which he insists everything is normal.

Copilot	FA-1
Normal, ok? No need to evacuate, ok?	No no no. I've already read up on it just in case...
Keep cool.	Is everything ok?
Yes.	Ok. Should I dim the cabin lights for a normal landing?
Yes.	

22:00:54 Both engine throttles set to idle.
22:01:08 The copilot asks the pilot if he has issued a stall message. The pilot answers "no." The subject is not raised again.
22:04:24 Performance of approach check list and briefing with two operational engines.
22:01:20 Start of the third descent leg from FL 130 to 1,900' at a descent rate of 1,244 fpm.
22:09:13 Heading 270° for approach to runway 27 at Seville Airport (9 in figure 4).
22:09:51 Second notification to ATC of event: "Ok sir, we had a problem on one of our engines, a curious stall. I am not declaring emergency, just let to know we had this problem. Thank you."
22:09:52 Both engine throttles set above idle (10 in figure 4).
22:10:15 Aircraft at 1,900'.
22:11:14 Start of final descent for landing.
22:13:56 Flare.
22:13:59 Both throttles set at idle (11 in figure 4).
22:14:06 ATC question on ground assistance: "Clickair 1011 follow the yellow car, do you need special assistance?"
22:14:07 Landing gear touches down. Reverse thrust not used.
22:14:44 Pilot to ATC: "No, thank you sir, negative sir, thank you very much."

22:15:00 Pilot announcement to cabin crew: "Cabin crew normal operation"
22:15:06 Start of turn to exit runway via taxiway T-2 (12 in figure 4).
22:15:22 Pilot and copilot reiterate normal operation to purser, telling her "normal operation" after she asks again about the procedures in effect.
22:15:44 **2nd event:** Start of increased fuel flow to right engine from 820 lb/hr for 5 seconds (13 in figures 3 and 4).
22:15:49 **2nd event:** Maximum fuel flow to right engine of 13,660 lb/hr, after which the fuel flow to the right engine decreased until the engine was stopped (13 in figures 2 and 3).
22:15:50 **2nd event:** 889 °C EGT in right engine (13 in figures 3 and 4).
22:15:51 FA-1 enters the cockpit and asks, "Evacuation?"
22:15:53 High pressure fuel valve to the right engine is closed.
22:16:17 FA-2 calls cockpit to inform that she has deployed a slide.

Pilot	FA-2
	We've deployed a slide because of a fire, hello?
Is there a fire? Is there a fire?	Uh, it just went out, but we deployed a slide but we haven't ordered an evacuation.
No, there's no evacuation. Stand by, stand by.	OK.

22:16:54 The pilot asks Seville TWR if there is a fire, which replies that they had seen a flame seconds before but that they could not see an engine fire.
22:17:11 Discussion in the cockpit between the purser and the pilot as to why slide 2L was deployed without an evacuation order.
22:18:09 Pilot instructs the passengers to remain seated.
22:19:16 Conversation between pilot and copilot: "What do we do now?" "Cut the left engine."
22:19:18 High pressure fuel valve to left engine closed.
22:20:05 End of FDR data.
22:21:26 CVR records two-minute conversation between FA-1 and FA-2 and the pilot in which FA-2 explains why she deployed the slide and the conditions for doing so in accordance with her procedures.
22:22:38 ATC to aircraft: "Clickair 1011, do you need stairs to disembark?"
22:22:42 Pilot to ATC: "Yes sir, I just requested stairs and buses to take passengers."
22:23:28 Pilot to FAs: "I don't want you all here, I want you in the cabin."
22:23:40 Announcement by pilot to passengers on deplaning once the stairs arrive.
22:26:29 End of CVR recording.

Figure 4 shows a graph of the relevant flight and engine data as recorded by the FDR during the flight. Specifically, it shows altitude, heading, fuel flow (FF) in both engines (2 right and 1 left), EGT for the right engine (EGT engine 2), low pressure rotor rpm's for the right engine (N1 engine 2) and the position of both throttle levers in the cockpit (TLA engine 1 and 2).

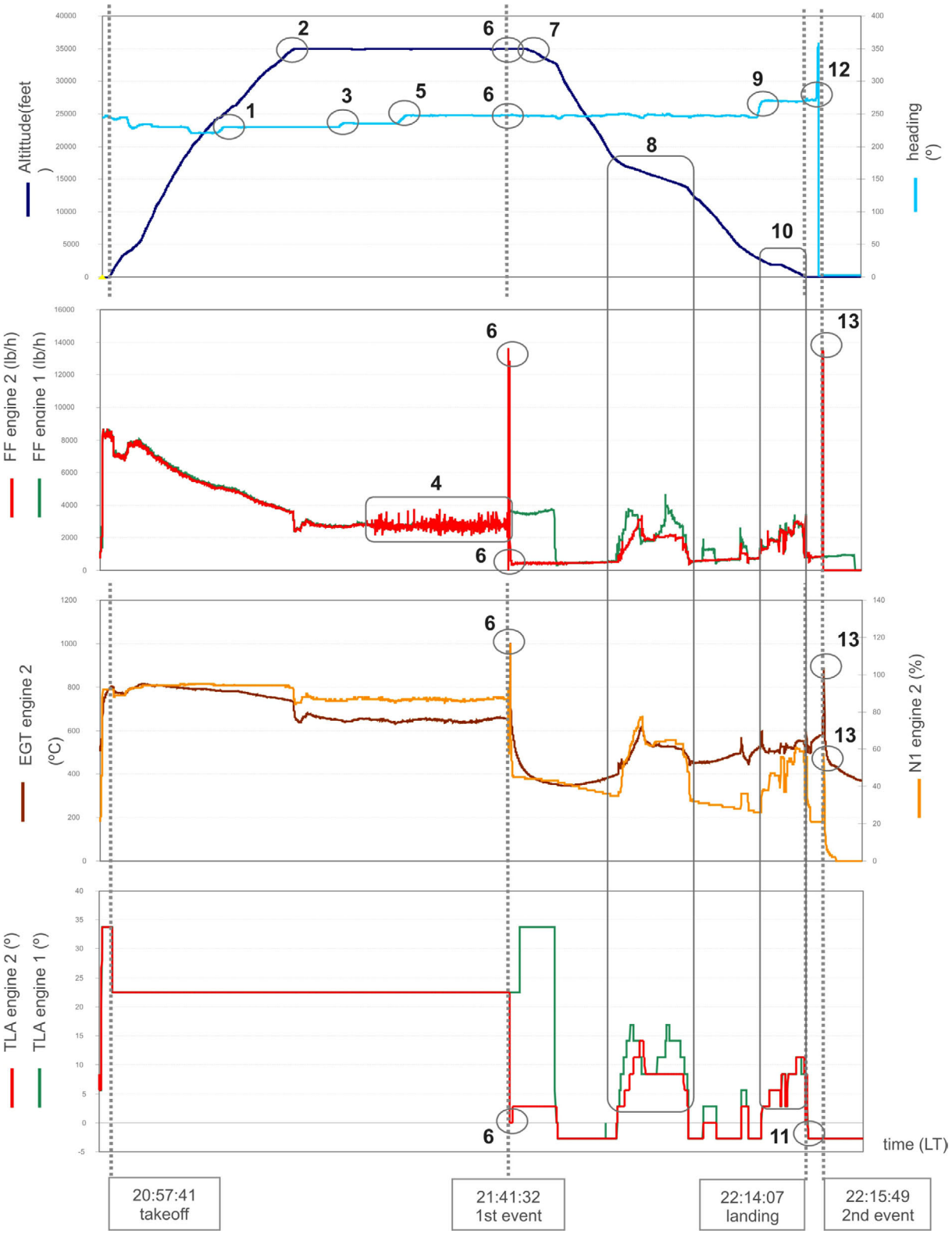

Figure 4. FDR data for entire flight Barcelona-Seville

1.7. Aerodrome information

Seville Airport has one asphalt runway in a 09-27 orientation. Exit taxiway T-2 is perpendicular to the runway and 2,500 meters away from the runway 27 threshold.

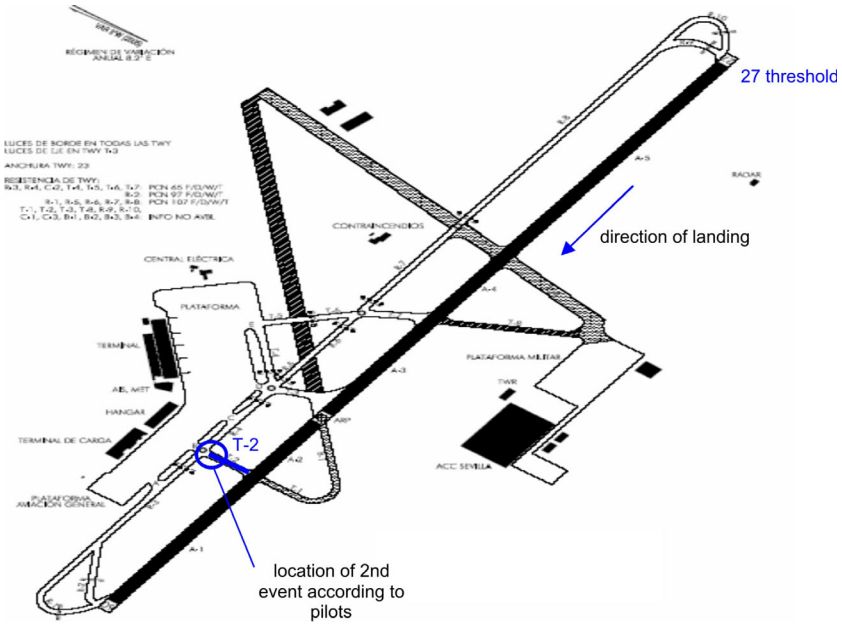

Figure 5. Seville Airport and location of 2nd event

1.7.1. *Alternative aerodromes*

Considering the location of the first mid-flight event and the steps specified in the "EGT and N1 overlimit" procedures (section 1.9.2), the estimated distances and times to the nearest airports with ATC service where aircraft EC-GRF could have landed are as follows:

Albacete: 64 NM (15 min)
Granada: 70 NM (17 min)
Almería: 87 NM (21 min)
Málaga: 111 NM (26 min)
Murcia: 112 NM (26 min)
Madrid: 117 NM (28 min)
Seville: 140 NM (33 min)

Figure 6. Estimated time and distance to alternative airports

1.8. Survival aspects

Following the second event, the aircraft stopped on taxiway T-2 (figure 5) where, due to the deployment of the left rear slide, the passengers had to be disembarked. As evidenced by the CVR recording, following the second event the copilot asked company ground personnel for stairs and buses to be sent to the aircraft, which took 15 minutes.

The fire brigade was informed by Seville TWR two minutes before the landing of the problem in one of the aircraft's engines, as well as of the pilot's decision not to declare an emergency. According to information provided by Seville airport, the brigade was positioned outside its building, from where it could see the landing. After the explosion, they headed toward the aircraft and after verifying that the right engine was stopped and that there were no signs of fire or heating, they waited without applying any extinguishing agent to the aircraft until the passengers had disembarked.

The passengers were disembarked via the front left and rear left doors after the slide on the latter, which could not have been used due to a puncture, was disassembled.

The aircraft was towed to its parking stand at 22:51.

1.9. Tests and research

1.9.1. *Statements*

Statement from the pilot

They arrived at Barcelona airport at around 15:05 and the copilot performed the walkaround check. The complete route was Barcelona-Geneva-Barcelona-Seville-Barcelona, the third leg being the incident flight.

The flight proceeded normally until about 30 minutes before the arrival in Seville when, while en route at FL350, a stall occurred along with a flame at the engine exhaust nozzle that they did not see, but which was witnessed by the passengers and one of the FAs. The cockpit indication was a momentary "EGT overlimit" in the right engine, which quickly returned to within normal parameters. There was no indication of a fire. He told the copilot to go to the back to see what was happening, but he did not see anything. At the time of the incident, the copilot was the pilot flying, but he quickly took over the controls of the aircraft and maintained control until the end of the flight. He reduced the engine's power to idle and kept it like that until the landing. He did not turn off the engine despite the procedural guidance to do so because all parameters had returned to normal and he thought the engine was fine. He did not

consider the need to declare an emergency, only informing ATC prior to landing of the problem.

The landing took place at 138-140 kt with full flaps and without thrust reversers. He instructed the FAs of the normal procedures in effect. As they were taxiing to the parking stand with both engines at idle, a second stall occurred with another flame at the engine exhaust nozzle and no signs of fire. He got a call from a FA telling him that there was a fire and that she had deployed the slide. With the aircraft stopped on the ground, he applied the parking brake, cut the right engine and then the left. Since they could not continue taxiing due to the deployed slide, he asked for stairs and the passengers deplaned via stairs at the front left and rear left of the aircraft once the slide was removed.

Statement from the copilot

He was seated in the RH seat. With 30 minutes to go before reaching Seville, they heard a loud explosion, accompanied by an "EGT overlimit" message for the right engine. The purser called them and told them they had seen a fire in the right engine. They performed the first part of the procedure by setting the throttle to idle and waited. Since engine parameters were within limits, they decided not to turn the engine off. The captain told him to go take a look at the engine in case there had been a fire, but everything was normal. A few minutes later they increased power to 75% to check engine response, which was normal. They maintained the throttle at 40% for the rest of the flight. A second explosion occurred during the taxi, and he himself witnessed the glare from the flame since it was night time.

Statement from the purser FA-1

They were concluding the onboard sales service and they were near the wing emergency exits. She felt an explosion and a burning odor, and got word from FA-2 that there was a fire in the right engine. She went to the cockpit to inform the captain who, after checking that there were no indications of fire in the cockpit, sent the copilot to check the engine. She asked the captain what he wanted her to do, and he told her to secure the cabin and to follow normal procedures.

After the flame, they put an assistant FA from another company in the emergency seat over the wing in case of a possible evacuation. While taxiing, another explosion occurred which lit all the windows red due to the fire.

Before the legs, they had held a briefing, which was not attended by the cockpit crew, where all the FAs review some of the procedures. She could not recall which procedures they had reviewed before the incident flight.

Statement from FA-2

At the time of the first explosion she was looking toward the front, offering the in-flight sales service, when she smelled a burning odor and saw a fire that lasted around 2 seconds and then went out. They secured the carts and she, along with the assistant FA, went to the cockpit to talk to the pilot, who verified that everything was fine and normal operations were in effect.

Once in her seat, she went over the procedures with FA-3. As they were taxiing, another explosion took place and she saw a fire that extended to the rear of the aircraft, so she decided to deploy the slide on her side, which was constantly moving.

Statement from FA-3

She was looking toward the rear at the time of the first explosion. They secured the carts and FA-2 went to the front of the aircraft. When she returned she explained to them what had happened. After landing, while they were taxiing, FA-2 screamed out that there was a fire, and she herself could see a red glow out the right side windows. After deploying the slide, FA-2 went to the front of the aircraft and FA-3 stayed behind to calm the passengers that had gotten up.

Statement from FA-4

At the time of the first explosion she was looking to the front but she did not see the fire. They secured the carts and after FA-1 and FA-2 talked to the pilot, the purser told them to secure the cabin and that normal procedures were in effect. After the fire on the ground, she stayed at the front of the aisle, calming passengers who had gotten up to leave.

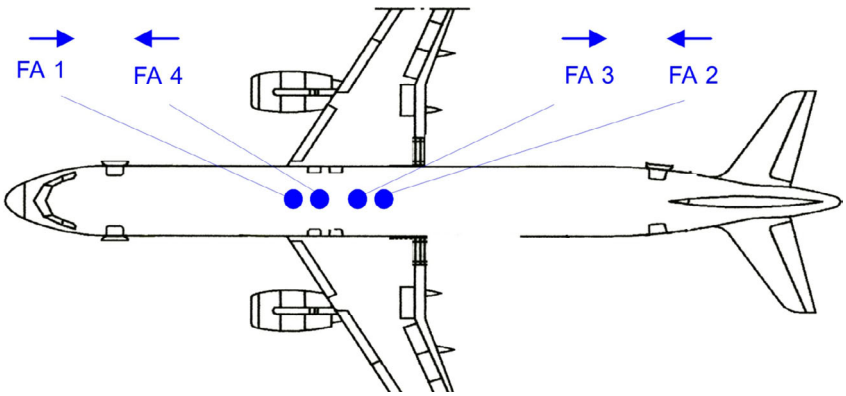

Figure 7. Position of the FAs during the first event

1.9.2. *Indications and procedures for excessive temperature and rpms*

The main engine parameters, including EGT and N1, are constantly displayed on the engine screen and on ECAM warnings.

EGT readout

As described in Chapter 12 of Part B of the operator's Operations Manual, the EGT indicators are shown graphically with a needle and numerically with a boxed number (figure 8). The graphical display shows the maximum temperature (855 °C) and the maximum allowable temperature (890 °C). When the EGT is below the maximum, the needle and the number are green. When the EGT is between the maximum and maximum allowable, the needle turns amber while the number remains green. If the maximum allowable is exceeded, the needle flashes red and the number turns red. Even if the temperature decreases, the value reached above the maximum is indicated with a red line until the next takeoff or until maintenance is performed.

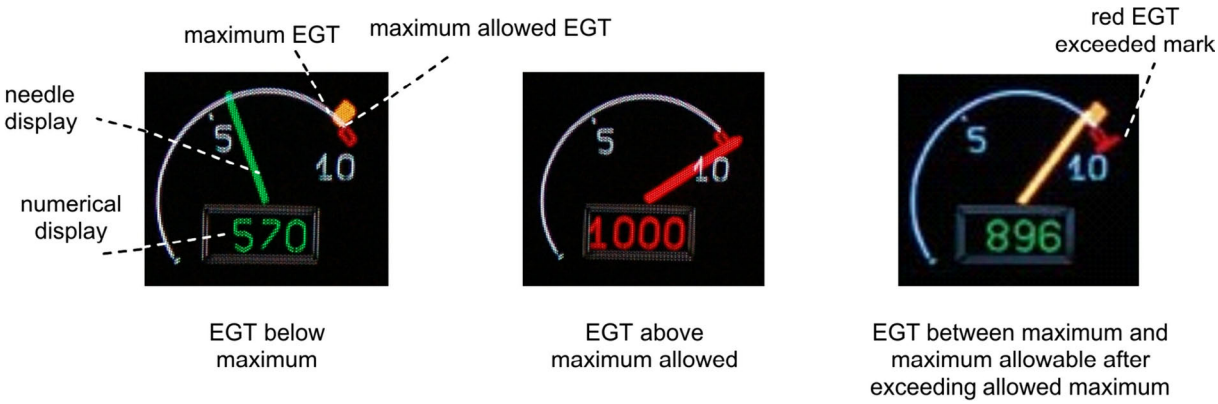

Figure 8. EGT indications on the ECAM

N1 readout

The N1 indicator is similar to that for EGT. When the N1 value is below the maximum, both the needle and the numerical value are green. If the maximum value is exceeded, the needle flashes and turns amber. If the maximum allowable value of 102% for this engine is exceeded, both the needle and the number flash red. After exceeding the maximum allowable, the value of N1 reached is indicated in red until the next takeoff or until maintenance is performed.

Exceeding the maximum allowable value of EGT or N1 both result in an audible warning consisting of a simple gong, along with a light indication on the master caution panel.

Procedure for EGT and N1 values above maximum allowable

Chapter 3 of Part B of the operator's Operations Manual, which contains abnormal and emergency procedures, defines the same actions for EGT, N1 or N2 above the maximum allowable values (figure 9). The procedure differentiates between two situations, depending on the engine values reached. The least severe conditions call for reducing thrust, while for the most critical case (EGT above 935 °C or N1 in excess of 103.8%), as occurred with aircraft EC-GRF, the procedures calls for setting the throttle at idle and then stopping the engine. The procedure also states that if the engine cannot be stopped for whatever reason (not defined in the procedure), to land at the nearest airport while applying the minimum thrust required for safe aircraft operation.

Each of the procedural steps appears automatically on the ECAM beneath the main engine parameters (figure 9). Each action is shown in blue and disappears upon execution.

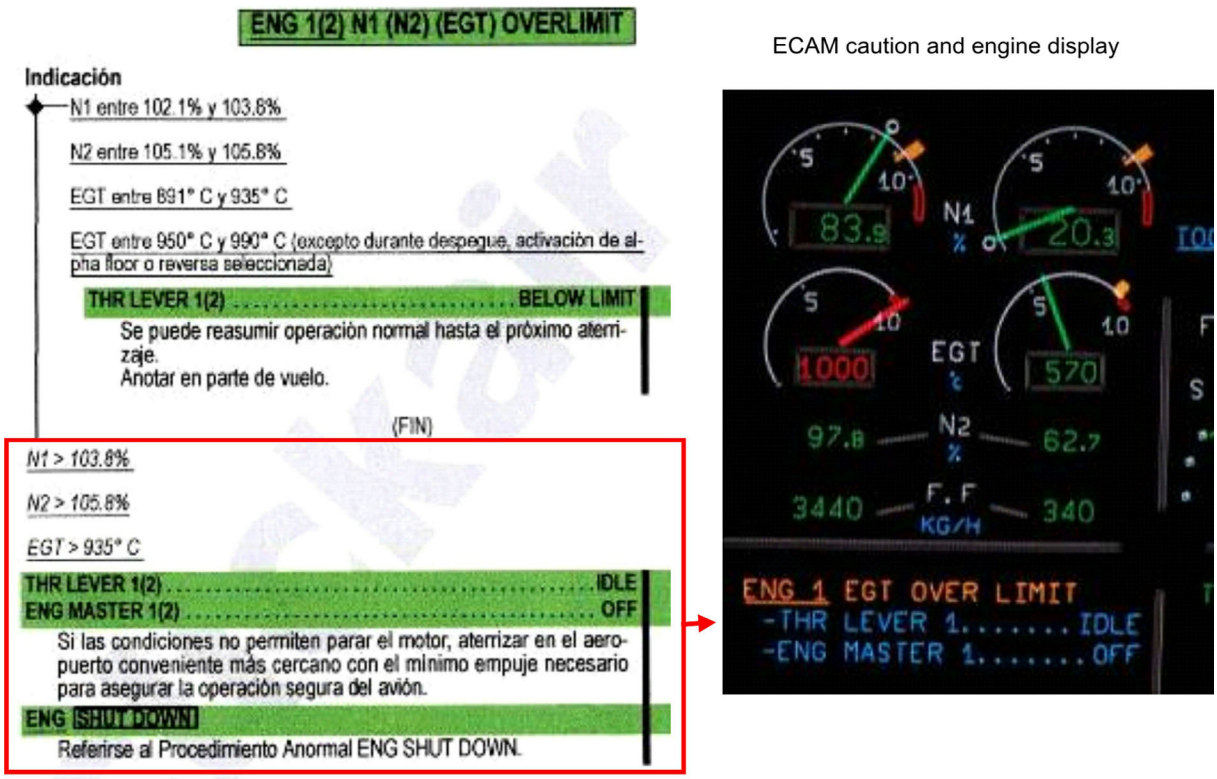

Figure 9. Procedure and indications on the ECAM for «EGT and N1 overlimit»

1.9.3. *Procedure for a compressor stall*

As indicated in Chapter 3 of Abnormal Procedures in Part B of the Operations Manual, an engine stall is indicated by abnormal noises, flames in the exhaust nozzle and, in

some cases, an elevated EGT and a significant EGT increase upon increasing thrust. The procedure to be followed in case of a stall in flight is to place the affected engine's throttle at idle and to check that engine's parameters.

1.9.4. *Evacuation procedure*

Both the Operations Manual and the Flight Attendants Manual state that an evacuation order must be initiated by the cockpit crew. The operator's passenger evacuation procedures call for the following messages to be relayed by the cockpit crew to the cabin crew:

- An announcement to the cabin crew using the words "cabin crew take your stations"
- The evacuation order with the words "passenger evacuation" accompanied with the actuation of the command switch on the evacuation panel which illuminates a red light and activates an audible warning. In its Operations Manual, the operator explicitly forbids actuating this switch from the passenger compartment.

Once the cockpit crew has made these announcements, the cabin crew must look out the door windows and evaluate outside conditions before deciding whether to deploy the slide and informing the passengers how and where to evacuate the aircraft.

Nevertheless, as defined in the operator's FA Manual, there are exceptions which allow for a FA to initiate an evacuation procedure under obvious emergency conditions without permission from the captain. One of these is fire or smoke inside or outside the aircraft, as long as the aircraft and engines are completely stopped. Under these special conditions, the same procedures apply as for a cockpit crew-initiated evacuation and require for outside conditions to be evaluated before initiating any action. Figure 10 shows the complete text where said conditions are listed.

2- CONDITIONS FOR EVACUATION
WARNING: The evacuation order shall always be given by the Captain, however, any FA may initiate an evacuation under the following circumstances:

FIRE/SMOKE seen inside or outside the airplane.
SUBSTANTIAL STRUCTURAL DAMAGE to the airplane.
EVACUATION WITNESSED IN ANOTHER PART OF THE AIRPLANE
UNEXPECTED LANDING Before initiating the evacuation, the airplane MUST BE COMPLETELY STOPPED with the engines stopped

In the case of a PLANNED WATER LANDING, PLANNED EVACUATION ON THE GROUND, REAL BOMB THREAT, the FAs are to follow the instructions given by the CAPTAIN during the evacuation briefing.

Figure 10. Evacuation conditions as defined in the FA Manual

The jet blast area for an engine at idle, as indicated in the Flight Crew Operations Manual for aircraft models A-319/320/321, is shown in figure 11, where the position of the deployed left rear slide is shown. The area in red is defined by the manufacturer as dangerous due to the presence of high temperature exhaust and speeds in excess of 105 km/h. The area shown in yellow is affected by gases below 105 km/h.

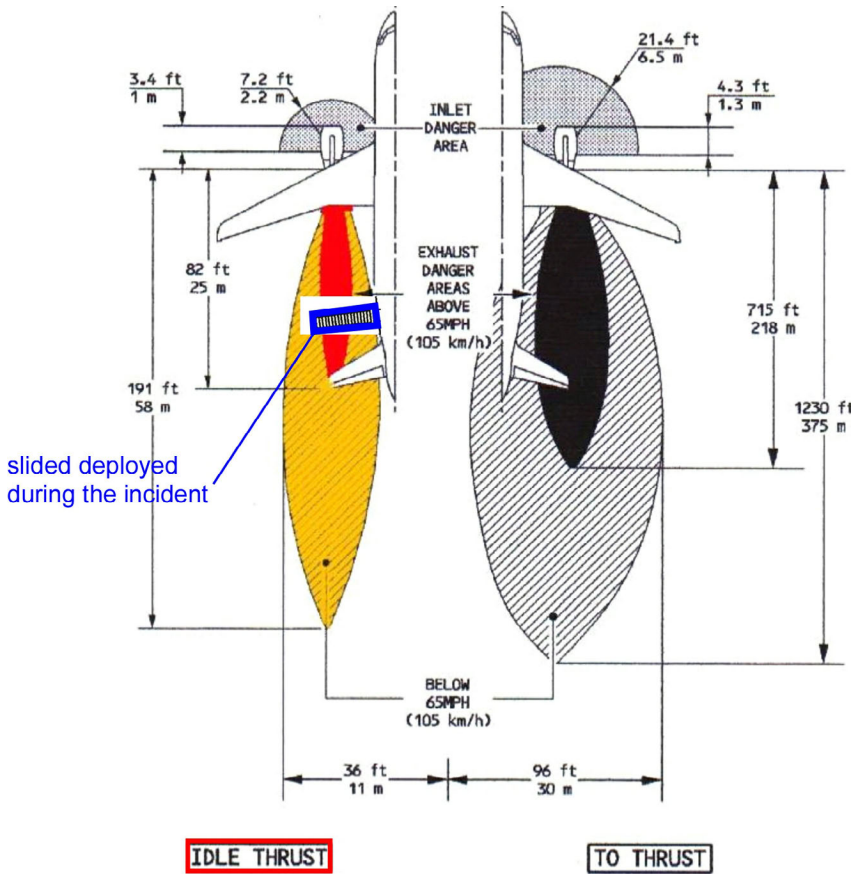

Figure 11. Area affected by jet blast with the engine at idle

1.10. Additional information

There is an Airbus publication on passenger compartment emergency procedures titled *Getting to grips with Cabin Safety* which strives to be a guide for operators developing their own procedures as part of their safety program.

The chapter devoted to the role of the cabin crew states that in most cases, evacuations are initiated by the cockpit crew, but that under certain conditions they may be initiated by the cabin crew. These conditions must present an obvious danger, such as an out of control fire, thick smoke, severe structural damage, a water landing or a loss of communication with the flight deck.

The cabin crew must evaluate the danger and the consequences of a delay in case of an evacuation. Fire or thick smoke would require immediate action. In any event, the document emphasizes that if the cabin crew considers an evacuation necessary, to first contact the cockpit crew to inform them of the situation and await instructions. Should communications with the pilots not be possible, the evacuation must be initiated. Moreover, any evacuation requires coordination since not all crew members may be aware of the situation or risks, therefore requiring all members to be informed.

2. ANALYSIS

2.1. Aspects involving the aircraft

2.1.1. *Right engine fuel control*

On 10 October 2006, aircraft EC-GRF, operated by Clickair, experienced an increased fuel flow to the right engine while in flight and on the ground which led to an increase in the exhaust gas temperature and in the low pressure compressor rotor rpm's (N1). The events took place 34 minutes apart and, in the case of the mid-flight event, the values for EGT and N1 exceeded the maximum allowable engine limits, reaching 1,006 °C and 117%, respectively.

FDR data showed that the fuel flow increases were uncommanded and unrelated to any actions taken with the engine controls, and that even with the engine throttle at idle, the fuel flow experienced two excessive, momentary increases.

Prior to the first event, the system recorded a fault in channel A for the FMV resolver and servo valve torque motor. Tests on the HMU later ruled out a problem in the electrical connections between channels A and B and the ECU and the FMV, or in the FMV torque motor or the valve itself, though they did confirm the presence of a problem in channel A of the FMV resolver due to a faulty connection in one of the resolvers pins. It was verified that under these conditions it was impossible to relay information concerning FMV position through channel A, information that the ECU uses to adjust the fuel flow. Under these conditions, the ECU would be incapable of adjusting the servo valve's position via the FMV torque motor, and thus the amount of fuel supplied to the engine. The events of the incident involving aircraft EC-GRF are consistent with this scenario.

On 8 August 2006, the right engine was installed on the aircraft. The HMU pin that was found improperly connected may have been badly seated during the installation, resulting in bad contact due to vibrations while in operation.

The ECU's redundant design is such that when a fault in any of a channel's sensors is detected, the information from the other channel is used. The FMV fault in channel A took

place 10 minutes before the first event, meaning that from that moment on, including during the first incident, the system should have been using channel B's FMV data.

Under this new operating mode that should have been in effect, the fuel control also failed since the first mid-flight incident took place, which would indicate that channel B of the FMV also failed. And yet, a fault in channel B did not take place, or was not recorded if it did. Inspections of the three components involved in fuel control (ECU, FMV and the associated electrical connections) did not show any malfunction in channel B. The possibility of a dual failure of the FMV in both channels is unlikely, since it would involve a failure in the operation of channel A's fuel flow mechanism, a new fault in channel B and a fault in detecting and recording the second fault.

The other possibility is that following the fault in channel A's sensor, that channel B did not go into operation. Having the system operate with the FMV data from channel A, in which the ECU would have had no information regarding the FMV position, thus preventing its adjustment, would explain the problems experienced in flight by aircraft EC-GRF. It would, however, imply a fault in the ECU in that it did not change channels once the malfunction was detected. Tests performed on the ECU did not reveal any problems with the unit.

In conclusion, the fault in the channel A FMV resolver was confirmed, but not the reason why the ECU did not use the data from channel B of the FMV, or, if the change did take place, why the fault in channel B was not detected or recorded. No explanation could be provided by the manufacturer.

Unlike in the incident flight, where only faults involving channel A were recorded, in the five days prior, the ECU had recorded faults in the FMV resolver data received from both channels, as well as in the torque motors. In spite of having been recorded by the system, the operator was unaware of these faults and thus took no corrective actions. A safety recommendation is issued in this regard.

2.1.2. *Slide on rear left passenger door*

The correlation of CVR and FDR data show that the left rear passenger door slide was deployed three minutes and one second before the left engine was stopped. FA-2, who deployed the ramp, stated that it would not stop moving after being deployed, as explained by the fact that the engine was still in operation. During all this time, the slide was subjected to the jet blast of the engine at idle which, as shown in figure 11, results in high velocity (in excess of 105 km/hr in some areas) and high temperature air.

The impact of the high velocity and temperature engine exhaust for 3 minutes and 1 second is considered as the probable cause behind the puncture suffered by the slide, which rendered it unsuitable for use.

2.2. Aspects involving the cabin crew

The cabin crew consisted of four FAs, two of which (FA-3 and FA-4) had little experience (60 and 30 total flying hours). The purser had the most experience with 4,000 hours, followed by FA-2 with 2,000 hours, considered to be ample experience.

The CVR recordings did not log the conversations during the first mid-flight event, but did record the second event. It was noted that after the first mid-flight incident, the purser was informed by the cockpit crew of the normal condition of the engine. She was explicitly told that there would be no evacuation and to remain calm. However, after the landing and the pilot's announcement regarding normal operations, the purser once more went to the cockpit to ask about an evacuation, in violation of established procedure and, more importantly, interrupting the cockpit crew's efforts to combat the situation and to maintain ATC communications. The primary task of the cockpit crew during an emergency is to manage and address the emergency through the use of the proper procedures, any interactions with the cabin crew being a secondary consideration.

The statements by the FAs and the CVR recordings show that after both events, FA-2, who was in the rear of the aircraft, and FA-1 went to the cockpit to find out what had happened and to explain the actions taken by FA-2. FA-1, however, did not relay the information received from the cockpit crew to the remaining FAs, especially concerning the instructions not to evacuate and to follow normal procedures at all times. This shows a lack of coordination and information flow between the purser and the other FAs.

The cabin crew and their actions are of vital importance in emergency situations since they are in direct contact with the passengers. Their main function is to calm passengers and to keep the situation in the cabin under control. Aircraft EC-GRF was carrying 163 passengers under the care of 4 FAs. After the flames, especially after the one that took place while taxiing, when the passengers instinctively tend to get up and try to exit, FA-2's actions, instead of focusing on calming the passengers and on their safety, were instead directed at justifying her actions to the pilot. In going to the cockpit after deploying the slide, she not only left her area of responsibility unattended, but she also left an inexperienced FA in charge of the rear section of the aircraft with a large number of passengers, with the rear left door open, the slide deployed and the engine on that side in operation.

The evacuation procedures in the Operations Manual and in the Flight Attendants Manual clearly state that it is the cockpit crew that must initiate an evacuation through the use of predetermined announcements and visual and audible warnings. The pilot not only did not call for or order an evacuation, but in fact insisted on normal operations. In spite of that, FA-2 initiated an evacuation without checking outside conditions before taking any actions, as required by procedure.

Once the ramp was deployed, the purser, along with FA-2, got involved in giving explanations as to when a FA can initiate an evacuation, relegating passenger safety to the background. Instead, the purser should have ordered the slide detached and the rear left door closed. Should the situation had gotten out of control and a passenger tried to exit via the ramp with the engine in operation, the consequences would probably have been more severe. The lack of experience of FA-3, who was beside her, probably influenced her indecision or inability to keep FA-2 from opening the door.

The final inoperative state of the slide, probably due to the jet blast, would have prevented its use should the situation have deteriorated and an evacuation become necessary. This would have left one fewer exit for disembarking the 163 passengers, increasing evacuation times and therefore the risk factor for said condition.

Although FA-2's experience of 2,000 flight hours is considered sufficient, her actions showed a lack of training and control in light of existing conditions.

The incident has revealed a lack of knowledge of evacuation procedures, as well as of the special conditions required for initiating them. The manufacturer's recommendations make reference to an out-of-control fire condition for the initiation of an evacuation, though only after informing the cockpit crew. In the case of aircraft EC-GRF, there was neither an uncontrolled fire, since the flame was temporary as described by both the FAs and the controller, nor was there any communication between the FA and the pilots or the other FAs.

The situation posed a risk to the safety of the passengers and could have had serious consequences in case of an evacuation. A safety recommendation is issued which addresses the need for improved flight attendant training.

2.3. Aspects involving the cockpit crew

Forty-four minutes into the flight, with the aircraft en route at FL 350 on a heading of 248°, the cockpit crew felt an explosion, vibration and a temporary increase in EGT and N1, along with an ECAM "EGT and N1 overlimit" warning, meaning that the maximum allowable engine limits had been exceeded. These warnings were accompanied by a brief flame which, though identified as a fire by the cockpit crew, did not result in a fire. No fire warnings were received in the cockpit.

The ECAM indicators of "EGT and N1 overlimit" are preceded by a change in the colors of the graphical and numerical displays of both parameters, which are always shown on the ECAM, as well as by acoustic and visual warnings. Once the maximum allowable values are exceeded, the procedures to be followed are displayed just below the indicators for both parameters. In the case of the incident involving aircraft EC-GRF, as confirmed by the pilots' statements, the increase in these parameters was momentary

and the values immediately returned to normal, though a red mark indicated the maximum value reached. Despite the presence of the data (the red marks and the ECAM procedure) which indicated the type of event that had taken place and the actions to be taken, the crew, faced with conditions similar to those of an engine stall and an "EGT overlimit," identified the event as a stall, as evidenced by the conversations held between them and with ATC.

The "EGT overlimit" procedure was partially carried out in that they performed the first step, which was to set the throttle to idle, but they did not perform the next step, namely to stop the engine and continue on just one engine. The procedure offers the option of not stopping the affected engine if not allowed by conditions, though in that case a landing must be effected as soon as possible. The duration of the CVR did not allow for the content of the conversations during the first event to be known, though in their statements both pilots expressed that they did not consider it necessary to stop the engine or head for another airport since the behavior of the engine led them to believe it was fine. While it is true that they were near the destination airport, they could have reached other airports in half the time. This action by the crew, the ATC communications and the crew's statements are better suited to the "ENG STALL" procedure.

The crew continued with the flight a further 32 minutes until they reached Seville airport. The approach and landing check lists and briefings performed by the crew did not consider the possibility of a missed approach with one engine inoperative. The position of the right engine throttle as recorded by the FDR showed that not only was the engine not stopped, but that it was used twice during the approach. This indicates that the crew misidentified the cause of the abnormality and the resulting gravity of the situation, questioning the indications and the governing procedure as presented on the ECAM. A safety recommendation is issued in this regard.

Although the right engine parameters during the rest of the flight before landing were normal, which led the crew to believe that it had been a momentary event, the second event on the ground would have been avoided had the procedure been carried out in its entirety and the engine stopped.

After the landing, during which reverse thrusters were not used, once on taxiway T-2, the second fuel flow increase, flame at the engine exhaust nozzle and increase in EGT and N1, though within limits this time, took place. The crew immediately stopped the aircraft and 4 seconds later stopped the right engine, keeping the left engine idle. Immediately afterwards, the pilot got the call from FA-2 informing him that she had deployed the left rear slide. From that moment on, the pilot was extremely slow to react, as evidenced by the CVR recording in which he is heard asking why the slide was deployed, insisting that he had not ordered an evacuation, in requesting buses and stairs, in worrying over the APU start-up, in addressing the passengers, in directing FA-1 to check for a fire, in asking what they were going to do and lastly in stopping the

left engine after a 3-minute lapse. During all this time, the door was open and the slide deployed, and their use by a passenger could have resulted in serious consequences.

The pilot's and copilot's attitudes were very calm, and transmitted an air of reassurance at all times, both in conversations among themselves and with the cabin crew as well as during announcements to the passengers.

Lastly, it is advisable that the cockpit crew be present at the pre-operations cabin crew briefings.

2.4. Aspects involving the operator

In the five days before the incident, the ECU recorded faults in channels A and B of the FMV resolvers for the right engine. Knowing about and tracking these faults would have allowed for the failing unit to be identified, which would have prevented the incident aboard aircraft EC-GRF. The faults, however, went unnoticed until after the non-volatile memory was downloaded from the ECU following the incident, hence the operator's failure to take preventive measures.

A safety recommendation is issued in this regard with the aim of establishing a control, tracking and evaluation system of recorded faults so as to prevent situations like those of this incident in which signs of the eventual problem were available for 5 consecutive days.

Additionally, the actions of the FAs revealed deficiencies in the section in the operator's Flight Attendants Manual which describes the conditions for an evacuation. Although said Manual specifies the condition that the plane and engines be stopped, it does not place enough emphasis on the importance, gravity and consequences of this action to the safety of the passengers. The situations described only refer to the presence of smoke or fire inside or outside the aircraft. This condition is far too general since it may be applied in many situations which do not warrant an evacuation and could lead to general confusion, as in the case of aircraft EC-GRF. The manufacturer's recommendation in its document *Getting to grips with Cabin Safety* refers to an out-of-control fire, this description being more explicit and ruling out situations such as those of this incident.

Moreover, the operator's procedures make no mention of a topic as crucial as prior communication with the cockpit and remaining cabin crew, since coordination under any circumstances, but more so during the evacuation of an aircraft with a large number of passengers aboard, is essential to keeping the entire process safe.

These aspects are considered vitally important since they may lead to situations which entail unnecessary risks. A safety recommendation is issued in this regard.

3. CONCLUSIONS

3.1. Findings

Aircraft

- The aircraft was properly certified and licensed.
- Uncommanded fuel flows took place which twice resulted in an increase in EGT and N1 and in the appearance of flames in the right engine´s exhaust nozzle.
- During the mid-flight event, the values of EGT and N1 reached 1,006 °C and 117%, respectively, in excess of the maximum allowable and resulting in an "EGT and N1 overlimit" warning on the ECAM.
- The channel A FMV resolver was not sending data to the ECU. That fault was recorded 10 minutes before the first in-flight event.
- It is not known whether the system used the channel B information from the FMV after the fault was detected in channel A.
- If the channel B information was used, the mid-flight fault resulting under the new conditions was neither detected nor recorded.
- The inspections of the ECU did not reveal any malfunctions.
- The inspections of the HMU, and of the FMV specifically, revealed a bad connection in one of the channel A pins for the FMV resolver which kept the ECU from receiving feedback on the position of the FMV. Once repaired, the FMV worked correctly.
- The electrical connections for channels A (J7) and B (J8) did not reveal any malfunctions.
- The right engine had been installed on 8 August 2006.
- During the five days prior to the incident, two dual channel FMV resolver fault and a single channel FMV torque motor fault were recorded.

Flight attendants

- FA-1, the purser, had 4,000 flying hours and was rated on the A-320.
- FA-2 had 2,000 flying hours and lacked the A-320 rating on her license.
- FA-3 had 60 hours and lacked the A-320 rating on her license.
- FA-4 had 30 hours and was rated on the A-320.
- During the incident on the ground, the left rear slide was deployed with the same-side engine at idle.
- The requirements established by the company for the start of an evacuation were not met.
- Three minutes and one second elapsed with the slide deployed in the jet blast from the idling left engine.
- The slide was rendered unusable due to a puncture.
- FA-2 left her area of responsibility in the aircraft after deploying the slide, leaving the door open and the slide deployed.

- The cockpit crew did not order the start of the evacuation.
- The passengers were disembarked via the two doors on the left side of the cabin once the slide was detached.

Cockpit crew

- The pilot, 60, had all necessary licenses and certificates to operate the aircraft. He had a total of 13,450 flying hours, 4,300 on the type.
- The copilot, 32, had all the necessary licenses and certificates to operate the aircraft. He had a total of 3,100 flying hours, 2,800 on the type.
- The first event took place 140 NM away from the destination airport.
- The crew misidentified the event as an "ENG STALL."
- The "ENG overlimit" procedure was not carried out in its entirety. The right engine was not stopped and no alternative airports were used to land as soon as possible as specified in the procedure if the affected engine is not stopped.
- The right engine was used twice during the approach.
- Reverse thrust was intentionally not used.
- No emergency was declared, though ATC was informed about the event.

Operator

- The operator was unaware of the faults that had been recorded by the ECU in the five days before the incident, and thus took no corrective action. These faults provide information to the flight crew as class 1 failure and are included on the post flight report.
- The Flight Attendants Manual contains incomplete and generic conditions under which a FA may initiate an evacuation.

3.2. Causes

The cause of the two events experienced by aircraft EC-GRF on the Barcelona-Seville leg was an uncommanded fuel flow increase, preceded 10 minutes earlier by a fault in the channel A fuel control. An inspection of the fuel system confirmed the existence of an actual fault due to a bad pin connection in channel A for the FMV resolver, which kept the ECU from receiving continous FMV position data, and thus from correctly controlling the amount of fuel.

If, once the problem in channel A was detected, the engine continued using that channel's FMV information without switching to channel B, that would imply an ECU fault. On the other hand, if the change to channel B did take place and the incident took place under those conditions, then that channel's fuel control also failed, which

would imply an FMV fault in both channels along with an ECU fault for not detecting or recording the channel B fault. Neither of these two possibilities could be confirmed since the torque motor, the FMV servo valve, the FMV, the J7 and J8 electrical connections for both channels between the ECU and the FMV, and the ECU worked satisfactorily in subsequent tests and inspections.

A contributing factor in the incident is the incomplete application of the procedure displayed on the ECAM, as a result of which the right engine was not stopped, which led to the second incident on the ground.

Additionally, during the second event, on the ground, the left rear slide was deployed with the left engine at idle without the order having been given by the cockpit crew and without outside conditions having been checked as required by the operator's procedures.

Lastly, there was a lack of control, tracking and analysis on the part of the operator involving the faults detected in its aircraft which could have prevented the incident, as well as margin for improvement in cabin crew training and procedures.

4. SAFETY RECOMMENDATIONS

During the investigation into the incident involving aircraft EC-GRF, a deficiency was noted in the control, tracking, analysis and resolution of faults recorded and detected by the systems in the operator's aircraft which would have allowed for the events of the incident flight to be avoided and anticipated. For 5 consecutive days the ECU recorded faults with the fuel control system, though the operator took no corrective actions since it was unaware of said faults.

REC 53/07. It is recommended that the operator, Clickair, establish a control system for tracking, evaluating and solving any faults recorded and detected in the operation of their aircraft.

The emergency management revealed a questioning attitude on the part of the cockpit crew regarding the data, warnings, messages and procedures presented by the ECAM, a lack of awareness concerning available redundant information, a failure to weigh the gravity of the situation, and an insistence on a different explanation for the event. This attitude led to an incomplete implementation of the procedure and resulted in the affected engine remaining operational and in service, which led to a new incident on the ground.

REC 54/07. It is recommended that the operator, Clickair, guarantee the compliance of its cockpit crews with the procedures and messages displayed on the ECAM.

The actions carried out by the cockpit crew revealed a lack of knowledge and a failure to comply with the procedures and conditions to be followed in case of an evacuation, of the reasons behind the conditions to be observed and of the safety consequences in case of non-compliance.

Additionally, it is necessary to impress upon flight crews the fact that in an emergency, the cockpit crew's priorities are focused on combating the emergency and not in updating the cabin crew, whose functions at that time should entail keeping the situation in the passenger compartment under control. The role of the cabin crew is essential since they are in direct contact with the passengers, which is critical in emergency situations. The emergency situation on the ground revealed a lack of knowledge concerning the functions, responsibilities and actions of the FAs.

REC 55/07. It is recommended that the operator, Clickair, enhance the training of its cabin crew to improve their response to abnormal or emergency situations through increased knowledge of:

- Procedures to be followed
- The technical reasons for the guidance included in the procedures
- The gravity of the consequences of non-compliance with conditions
- The priorities, goals, functions and responsibilities of the FAs in abnormal and emergency conditions.

The operator's Flight Attendants Manual establishes the conditions under which a FA may initiate an evacuation. In light of the manufacturer's recommendations, these conditions are incomplete and lack brevity, and could lead to unwarranted evacuations.

REC 56/07. It is recommended that the operator, Clickair, review its Flight Attendants Manual so as to complement and improve the section on evacuation conditions, adapting it to the manufacturer´s recommendations.