



**HELLENIC REPUBLIC
MINISTRY OF INFRASTRUCTURE AND TRANSPORT**

**AIR ACCIDENT INVESTIGATION AND
AVIATION SAFETY BOARD
(AAIASB)**



**ACCIDENT INVESTIGATION REPORT
AIRCRAFT ATR 42-500 SX-GRI
AT ATHENS INTERNATIONAL AIRPORT
ON OCTOBER 07, 2017**

ACCIDENT INVESTIGATION REPORT

01 / 2022

Aircraft ATR 42-500 SX-GRI at Athens International Airport

on October 07, 2017

This accident investigation was carried out by the Air Accident Investigation and Aviation Safety Board according to:

- **Annex 13 of the Chicago Convention**
- **EU regulation (EU) 996/2010**
- **Law 2912/2001**

“According to Annex 13 of the Chicago Convention of the International Civil Aviation, EU Regulation 996/2010 and Law 2912/2001, Accidents and Incidents Investigation is not intended to attribute blame or liability. The sole purpose of this investigation and the findings is to prevent accidents and incidents.

Therefore, the use of this report for any purpose other than to prevent future accidents and incidents could lead to misinterpretations.”

Members of the Air Accident Investigation and Aviation Safety Board

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Airline Captain, Investigator

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TITLE

OPERATOR	:	SKY EXPRESS S.A.
OWNER	:	SKY EXPRESS S.A.
MANUFACTURER	:	ATR-GIE AVIONS DE TRANSPORT REGIONAL
A/C TYPE	:	ATR 42-500
COUNTRY OF MANUFACTURE	:	FRANCE
NATIONALITY	:	GREEK
A/C REGISTRATION	:	SX-GRI
LOCATION OF ACCIDENT	:	ATHENS INTERNATIONAL AIRPORT Stand B62
DATE & TIME	:	SATURDAY OCTOBER 07, 2017AT 04:51 UTC
Note	:	All times UTC (LT = UTC + 3)

SYNOPSIS

On SKY EXPRESS Flight GQ 030 from Athens LGAV to Paros LGPA on an ATR 42-500 aircraft, the Head of Ground Crew, in communication with the pilots, requested the Captain of the aircraft to shut down both engines, which was executed by the Flight Crew. The Captain was then informed that there had been an injury to a member of the ground crew from the propeller of the number two engine.

AAIASB with Document 3359 on 18/10/2017 informed the National and International Authorities.

BEA with Document 3381 on 19/10/2017 has appointed an ACCREP on this Investigation.

EASA with Document 3442 on 27/10/2017 will act as the Agency's Technical adviser to the State of Design and Manufacturer.

1 FACTUAL INFORMATION

1.1 History of Flight

After passengers boarding, and after ATC start up clearance and in contact with the Ground Crew, with hand signals, N⁰2 and N⁰1 engines were started, using the Ground Power Unit (GPU) according to SKY EXPRESS Manual Part B, normal procedures. After normal start of both engines, all ground service equipment (GSE) were requested by the Captain to be removed. The Operator hastily disconnected the power cable and, in his attempt to untangle it he moved backwards, facing forward, with the result of being injured by the running feathered propeller of the N⁰2 engine. During the execution of the After Start check list, the Flight Crew was requested from the Rump Agent to shut down both engines due to the injured ground personnel. Both engines were shut down and the forward Left Door was opened. The Captain and

the Safety Pilot went to the accident site and stayed there until the Ground Crew member was transported by Ambulance to the Airport Medical Center.

1.2 Injuries to Persons

The injured Ground Crew member was transported by Ambulance to the Airport Medical Center for first aids and then to a Hospital where he was hospitalized for four days. He then remained off duty for about fifteen days.

1.2.1 Crew / Passengers / Ground Crew

Injuries	Flight Crew	Passengers	Ground Crew / Others
Deaths	0	0	0 / 0
Serious	0	0	1 / 0
Minor / None	0 / 4	0 / 19	0 / 0
Total	4	19	1 / 0

1.3 Damage to aircraft

No damages to the aircraft.

1.4 Other Damages

No other damages.

1.5 Personnel Information

1.5.1 The Captain

Pilot License	:	EL FCL 1729
Certificate of Validity	:	Issued on 26/05/2008 GR valid until 30/04/2018
Pilot License type	:	ATPL(A)
Medical Certificate validity	:	Issued on 05/10/2017 valid until 05/10/2018

1.5.2 The First Officer (On the right-hand seat under line training)

Pilot License	:	ELFCL 2713
Certificate of Validity	:	Issued on 22/01/2013 GR valid until 31/05/2018
Pilot License type	:	CPL (A)
Medical Certificate validity	:	Issued on 12/06/2017 valid until 16/06/2018

1.5.3 The First Officer (On the jump-seat as safety pilot)

Pilot License	:	EI FCL 3503
Certificate of Validity	:	Issued on 11/10/1998 valid until 30/06/2018
Pilot License type	:	ATPL (A)
Medical Certificate validity	:	Issued on 13/09/2017 valid until 13/09/2018

1.5.4 Cabin Crew

One Cabin Crew member not involved in the accident.

1.5.5 ATC Personnel

Not applicable.

1.5.6 Ground Crew / Maintenance Personnel

Ground Crew is involved.

1.6 Aircraft Information

1.6.1 Aircraft General Information

MANUFACTURER	:	ATR-GIE AVIONS DE TRANSPORT REGIONAL
A/C TYPE	:	ATR 42-500
MSN	:	M.S.N. 534
Registration	:	SX-GRI
State of Manufacture	:	France
Airworthiness certificate	:	1631, 22/02/2018
ARC	:	ARC 20/2017, 03/09/17 until 02/09/18
Total Flight Hours	:	34.021:32hrs

1.6.2 Maintenance data

There is no information of any malfunctions before the accident.

1.7 Meteorological Information

LGAV 070350Z 0000 kts CAVOK 17/14 Q1007 RMK NOSIG

1.8 Aids to Navigation

Not applicable.

1.9 Communication

All ATC communication with no problem. Ground Crew communication was conducted with hand signals without problem.

1.10 Aerodrome Information

The accident happened at Athens International Airport on stand B 62.

1.11 Flight Recorders

Not applicable.

1.12 Wreckage and Impact information

Not applicable.

1.13 Medical Information

The injuries of the Ground Crew member are described in detail in a written Hospital Report.

1.14 Fire

Not applicable.

1.15 Survival Aspects

The injured personnel was transported to the Hospital and stayed four days hospitalized.

1.16 Tests and Research

Not applicable.

1.17 Organizational and Management Information

SKY EXPRESS is a Passenger and Cargo Airline with AOC GR-021 issued on December 2016.

On March 2017, SKY EXPRESS Safety Manager issued and distributed a Safety Information Bulletin regarding HOTEL MODE Operation (Appendix 5.3).

On the day of the accident, the Airline Safety Manager issued and distributed a Safety Alert Bulletin (Appendix 5.4).

SKYSERV S. A. operates at airports in Greece. It offers a full range of Ground Handling services.

1.18 Additional Information

After this accident SKY EXPRESS Safety Department, issued and distributed a **Safety Alert Bulletin** revising the engine start up procedure, deciding to always start the N⁰ 2 in HOTEL MODE, to disconnect and remove all Ground Service Equipment (GSE) and all Ground Service personnel to be at a safe distance before releasing the HOTEL MODE Propeller Brake (Appendix 5.4).

1.19 Useful or Effective Investigation Techniques

1.19.1 Personnel interviewed

1. Sky Express Safety Manager.
2. The Flight Captain.
3. The under training First Officer on the right-hand seat.
4. The Safety Pilot on the jump-seat.
5. The Ground Service Supervisor acting as Rump Agent and Marshaller.
6. The injured SKYSERV S. A. Ground Personnel.

2 ANALYSIS

After boarding and ready to start, with clearance received from ATC and with the Flight Crew in contact with the Rump Agent, the N⁰2 engine was started followed by N⁰1 engine according to the Standard Operating Procedures Manual B3, Section 2, Page 115. After normal engines start, the Captain, with hand signals, informed the Ground Crew that with the parking brake set, all ground equipment can be removed. There after the Flight Crew started executing the After Start Checklist. When the Rump Agent noticed the GPU Operator approaching the N⁰ 2 engine, he shouted warning him of the danger but could not be heard as the Operator was wearing ear protection. After the accident, the Rump Agent, through the Cockpit com hatch, requested the Captain to shut down all engines due to the injury of a Ground Staff from the N⁰ 2 engine Propeller. Both engines were shut down and the forward left Entry Door was opened. Both the Captain and the Safety Pilot went to the injured Ground Person and stayed there until he was transferred to the Airport Medical Center.

3 CONCLUSIONS

3.1 Findings

1. The aircraft was Airworthy.
2. SKY EXPRESS had issued on March 2017 a Safety Information Bulletin regarding HOTEL MODE.
3. A Safety Alert Bulletin was issued by SKY EXPRESS Safety Department after the accident.
4. The Flight Crew was aware of the Procedure.
5. The Pilots had aircraft Licenses and Medical Certificates valid.
6. The Ground Staff members involved were aware of the Procedure.
7. The injured Ground person had the required rest period before the accident.
8. Environmental conditions did not affect the process.
9. No communication malfunction was reported between Pilots and Ground personnel.

3.2 Probable Cause

The movement of the SKYSERV S. A. GPU Handler, towards the N⁰ 2 running engine, is the Cause of the accident.

3.3 Contributing Factors

The loss of Situation Awareness of the GPU Handler during the removal of the GPU.

4 SAFETY RECOMMENDATIONS

To SKYSERV S. A.

2022-01: In order to raise Situation Awareness, it is recommended that SKYSERV S. A., refer and analyse during Initial and Recurrent Training of its Employees, the Cases of Accidents and Incidents that had happened during aircraft Ground Services and training should focus on the exclusion areas around the aircraft, whether there is use of HOTEL MODE or not.

Nea Philadelphia, 17 February 2022

CHAIRMAN

Ioannis Kondylis

Exact Copy

The Secretary

Kyriakos Katsoulakis

MEMBERS

Akrivos Tsolakis

Grigorios Flessas

Christos Valaris

Charalampos Tzonos-Komilis

5 APPENDICES

5.1 AIR OPERATOR CERTIFICATE

AIR OPERATOR CERTIFICATE (Approval schedule for air operators)		
Types of operation: Commercial air transport (CAT) ☒ Passengers ☒ Cargo Other:.....		
	HELLENIC REPUBLIC HELLENIC CIVIL AVIATION AUTHORITY	
AOC#: GR-021	"SKY EXPRESS S.A." Dba "SKY EXPRESS" address: Athens International Airport 'El. Venizelos' 48 Building, Spata 19004 Athens, Greece Tel.: +30 210 3564555 Fax: +30 210 3564150 E-mail: info@skyexpress.gr	Operational Points of Contact: Tel.: +30 210 3564555 Fax: +30 210 3564150 E-mail: info@skyexpress.gr Contact details, at which operational management can be contacted without undue delay, are listed in OM part A, chapter 1, page 4
This certificate certifies that "SKY EXPRESS S.A." is authorised to perform commercial air operations, as defined in the attached operations specifications, in accordance with the operations manual, Annex IV to Regulation (EC) No 216/2008 and its Implementing Rules.		
Date of issue: December 2016	 KONSTANTINOS LITZERAS HCAA Governor 	
Official Copy of the Original HCAA Central Secretariat		
Signature:		
Name:		
EASA Form 138 Issue 1		

5.2 NORMAL ENGINE START PROCEDURE

	Operations Manual ATR 42/72	Part	B3
		Section / Page	2 / 115
	Normal Procedures	Issue/Rev.	3/0
		Effective Date	07 / 04 / 17

2.7.6 Engine Start ALL ATR

1. BOTH: TAKE OFF BUGS..... SET & CHECK
2. CM1: TRIMSSET
3. CM1: FUEL PUMPS..... ON
4. CM1: DOORS CLOSED
5. CM1: CABIN SIGNS & EMER EXIT LT..... ON/ARM
6. CM1: BEACON & WING LIGHT ON

Both engines shall be started before taxi out. Always taxi out for take-off or in after landing on both engines. This will greatly reduce wear on landing gear side braces and on nose wheel steering, and thus, creates greater savings than by taxiing on one engine.

NOTE

If GPU is available - **always use it to start both engines.** This will reduce engine ITT during start up, and thus, greatly reduce wear of the engine and will greatly increase life expectancy of the engine.

NOTE

Do not let ITT exceed 850° C during an engine start. This is a company ITT limit. If experiencing a hot start, cut fuel **BEFORE** 816 degrees, so that ITT does not exceed 850 degrees during the shutdown. Remember, that ITT still rises **AFTER** fuel has been cut off.

If exceeding the limitations a technical remark - peak ITT and approximate time of overheat -has to be entered into the technical log and SKY EXPRESS Technical Department shall be informed.

March 2017 | |

Issue 2

Safety Information Bulletin



HOTEL MODE – Ground operations

The ATR aircraft is not fitted with an Auxiliary Power Unit (APU) but has propeller brake (named as “hotel mode”) that stops the propeller #2 (right engine), allowing the turbine (high & low turbine) to run and provide air conditioning and electrical power (DC) to the aircraft without the propeller spinning. The propeller brake system is a hydro-mechanical system installed on the right engine reduction gearbox enabling immobilization of the propeller and power turbine.



ATR authorize to walk around and operate near and around the engine (Hotel Mode) for ground operations. It must be considered as an Auxiliary Power Unit (APU). **When Hotel mode is running, at least one crew member must remain in the cockpit.**

- Nav lights: Airplane electrically supplied.
- Wings light: Hotel mode start-up.
- Beacon light: Before propeller rotation.

Refueling in hotel mode:

- For ATR 72- 100/200/210 and 212A (version 500/600): refueling when right engine is running in Hotel mode is **prohibited** due to the location of the refueling point.

Hotel mode with passenger embarking or disembarking:

For all ATR aircraft, it is authorized and safe to embark and disembark the passengers.



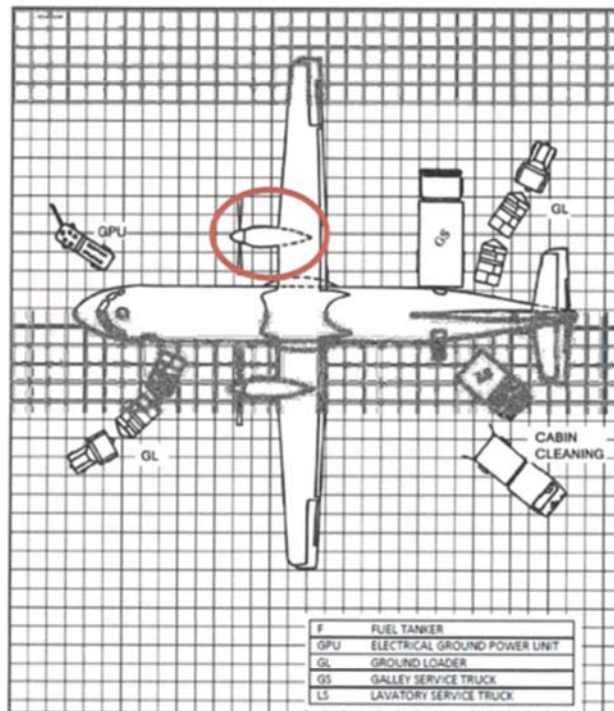
Hotel mode - load baggage:

For all ATR aircraft, it is authorized and safe to use the cargo and service door.

ATR permits the loading via the aft service door while the hotel mode is in operation. However, depending of the wind direction, you could have fumes odor coming into the cabin. It could be unpleasant for the passengers. Some airline decided to install a curtain to separate the passenger way with the servicing way (Service bulletin).

In Conclusion:

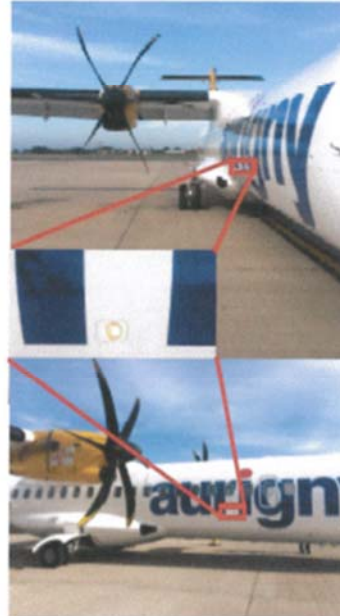
All ground operations (except refueling for the ATR72) including passenger embarking/disembarking are allowed and perfectly safe with Hotel mode.



"Hotel mode" SHUT DOWN
(Wing Light Off)



"Hotel mode" RUNNING
(Wing light Illuminated)



How do I know "hotel mode" is running?



Heat Haze

Engine Noise

Wing Light

Be aware of the "Hotel Mode" function on the ATR.

If you are unsure do not approach the aircraft.

Stop and ask your trainer for advice.

Sky Express

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<http://www.skyexpress.gr>

5.4 SAFETY ALERT BULLETIN

SAFETY ALERT

10 October 2017

Issue 4

Safety Alert Bulletin



Subject:	Start up with Hotel Mode
Reference:	ATR FCOM 2.03.09
AC Type:	ATR 42 and 72-212A aeroplanes.
Description:	In-service events have been reported, featuring damages on propeller and ground staff serious injuries.
Recommendation:	According to operational requirement and limitations, captain can decide to start up Hotel Mode at any time before start up clearance. Sky Express policy is to start up with Hotel Mode whenever a start is accomplished with external power connected on aircraft. The reason is the avoidance of ground staff injuries. Starting with Hotel Mode is described in FCOM, 2.03.09 which is attached as a reference to this Alert Bulletin. Hotel Mode should be disengaged only after all GSE have been disconnected and removed from aircraft and ground staff has been fending in a safe distance. Always consult latest revision of FCOM.

receive
**SAFETY
ALERTS**
through your
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5.5 START UP IN HOTEL MODE

 ATR F.C.O.M.	NORMAL PROCEDURES		2.03.09	
	HOTEL MODE START UP		P 1	001
				OCT 12

AA
R According to operational requirement and limitations, captain can decide to start up Hotel Mode at any time before start up clearance.

- **SERVICE DOOR** **CLOSED**
- **FUEL PUMP 2** **ON**
Check RUN LIGHT ON + FEED LO PRESS extinguished
- **WING LIGHTS** **ON**
- **PROP BRK** **ON / LOCKED**
Check PROP BRK Cyan light + Memo panel cyan light illuminated
- **ENG 2** **START IN HOTEL MODE**

START SEQUENCE :

- **ENGINE & PROP AREA** **CHECK CLEAR**
- **ENGINE START rotary selector** **SELECT START A + B**
A+B for the 1st flight of the day, then A or B for the next start
- **START 2 P/B** **DEPRESSED / ON**
Start timing for maximum starter run time
Check START P/B ON light illuminates
- **ENGINE ROTATION (NH)** **MONITOR**
- **When passing 10% NH (maximum 19% NH if ITT > 200°C) :**
 - **CL 2** **FTR**
 - **TIMING** **START**
 - **ITT rises within 10s** **CHECK**
 - **Oil pressure** **CHECK**

ENGINE START in HOT ENVIRONMENT

In hot environments to prevent an engine starting from a "hot start" : High OAT or High residual ITT, it is recommended to delay the fuel opening up to 20% NH. For residual ITT below 100°C, open fuel up to 10% NH.
From 100°C to 200°C delay fuel opening by 1% NH per 10°C of residual ITT, up to 200°C (20% NH)
Do not exceed 20% NH for fuel opening.

ATR 42 Model: 400/500

 ATR F.C.O.M.	NORMAL PROCEDURES		2.03.09	
	HOTEL MODE START UP		P 2	001
				OCT 12

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CAUTION

- | | | |
|--|---|------------------|
| <ul style="list-style-type: none"> - If ITT > 950°C - If 840°C < ITT < 950°C for more than 5s - If 800°C < ITT < 840°C for more than 20s | } | CL FUEL SO |
|--|---|------------------|

- When passing 45% NH :
 - START P/B ON LIGHT EXTINGUISHED
Check maximum start time and max ITT (refer to Limitation chap 2.01.04)
- When engines parameters are stabilized :
 - ENG START rotary selector OFF / START ABORT
 - GPU OFF
 - DC GEN 2 FAULT LIGHT EXTINGUISHED
 - DC BTC CLOSED
 - BLEED / PACKS / X VALVE OPEN
- PL 2 ADJUST AS REQ
- If Z > 5000 ft and SAT > ISA +25°C, advance PL 2 up to the GUST LOCK stop.