

Operation Group Field Notes

Please find below the field notes from the Operations Group as part of the overall investigation into TACA flight 390. The purpose of the field notes is to provide initial observations and comments to support the overall investigation. The report does not provide analysis or conclusions.

OPERATIONAL, HUMAN, METEOROLOGICAL CONDITIONS, ATS GROUP

Captain Jorge Martinez Group Chairman Operational Factors DGAC Honduras	Captain. Bob Hendrickson Office of Accident Investigator Federal Aviation Administration
Chris McGregor Flight Safety, Airbus	Captain Rodrigo Brenes COCESNA-ACSA delegated by El Salvador AAC. SMS
Mr. Jerome Progetti Aviation Safety Inspector BEA	Captain Paddy Judge Investigator -Air Accident Investigation Unit Ireland

1/ Introduction

Aircraft Details

TACA INTERNATIONAL Flight 390, Airbus A320, MSN1347, Registration EI-TAF

Photo 1



Accident site at Tegucigalpa

Photo 2



Runway 02

2/ Flight Crew Information and Operating Procedures

Name	Captain Eduardo D'Antonio Mena	First Officer Juan Rodolfo Artero Arévalo
Nationality	El Salvador and USA	El Salvador
Licence Number	SS 92, FAA 26734560	SS 920, FAA2673456
Medical	Class 1	Class 1
Medical Date	30 July 2007	30 July 2007
Began as Captain A320	21 Sept 2004	
Total Hours with TACA	11,196	1,607.20
Total Hrs P1 A320	2,926	
Total Hrs A320		375.17
Hours in 2007	827.25	143.5
Hours in April 2008	63.20	66.27
Hours in May 2008	58.23	34.01
Hours in last 7 days	20.52	
Last Simulator	17 March 2008	26 May 08
Comments	Good performance	Needs to improve CRM
Last Line Check	27 September 2007	3 February 2008
Last operation into TGU as Captain	10 May 2008	
Total landings in MHTG	52	3

Total recorded time of the Captain was 11,196 hrs. This included approximately 8,000 hours on Airbus aircraft with 2,926 hrs as PIC in the A320. He had completed 52 landings at MHTG prior to the event.

The First Officer was new to Airbus (with approximately 250 hrs)

Interview of Capt Miguel Mojica (TACA, Director of Flight Safety)

Captain Miguel Mojica was interviewed by Captain Paddy Judge (AAIU), Captain Rodrigo Brenes (AAC & ACSA-COCESNA), Bob Hendrikson (FAA) and observed by C McGregor (Flight Safety, Airbus). The key points and observations were;

MHTG is considered a special airport. The captain must be the operating pilot for take-off and landing. The captain must accrue over 300 hours in command before being considered for this airport (Note he was not sure of the hours requirement).

There is a 60 day window. Should the captain not fly into MHTG within those 60 days he must repeat the flight with the training captain. Training includes ground school and up to three touch and goes

- The airport is visual only.
- There is no specific simulator training for this airport.
- Both the A319 and A320 can fly into MHTG, but not the A321
- There are no SOPs to re-check runway performance should changes occur (weather, approach etc) on short flight legs
- Landing briefing is typically completed as part of the pre-flight briefing.

The Captain of flight, Cesare D'Antonio, was considered an excellent captain. We had the opportunity to review his training records. Via phone we contacted the training captain who recently completed training with both crew members (not acting together) and confirmed his training notes were an accurate reflection of his performance

The Captain's character was described as 'relaxing', but professional. He was single. There was no evidence of personal issues or problems at this time.

He was reprimanded once for continuing an approach, which was not stabilized, while on check.

We discussed the training notes of the First Officer. It was observed the training notes made reference to CRM and a need for improvement. We questioned the Training Captain further on this aspect.

The Training Captain said that the FO tended to take actions/decisions before the command given by the captain. It was stressed verbally to him that he must respect the decision of the captain.

The interviewers asked the opinion of the Training Captain regarding the working relationship between the Captain and the First Officer. The Training

Captain indicated that there could be problems in their working relationship. However this was a subjective statement based upon his personal knowledge of the characters.

The group thanks Captain Miguel Mojica and Capt. Osvaldo Jiménez (the simulator instructor) for his feedback and responses.

We also requested a written report from the training Captain Jiménez

Interview of Captain Soto (TACA, Chief Pilot and Training Pilot Honduras)

The group interviewed Captain Soto on two occasions the first being interrupted by Investigation business. Captain Soto is responsible for training and approving the captains who operate to MHTG.

As stated above the training includes ground school and touch and goes into MHTG.

Captain Soto kindly supplied the documentation used for the ground school.

We could open all of the files but not the videos.

Only captains receive the MHTG specific training, which consists of 2 parts, ground school and flight training

Captains must accrue over 400 hours in command except for local pilots where the requirement is 200 hours; In addition they must have a good training record and attitude before being considered for MHTG.

The training documents were supplied by Captain Soto to the investigation team.

The interview re-commenced on the morning of June 06 with Captain Paddy Judge (AAIU), Captain Rodrigo Brenes (AAC & ACSA-COCESNA), and Chris McGregor (Flight Safety, Airbus

Captains are recommended by the chief pilot for MHTG operation

If a pilot's 60 day currency lapses he must travel as an observer on a flight to MHTG and complete a second flight accompanied by a Line Instructor to re-establish approval. This occurred to Captain Cesare D'Antonio, hence he was 're-qualified' by an instructor. Captain Soto stated there were no issues with report (the Ops team requested a copy of the Instructor's notes)

A Committee comprising the Chief Pilot of the particular Taca airline, Capt Mojica, and various technical experts, depending on the item under scrutiny, meet once a month to review exceedances. If the exceedance merits, the

Captain is removed from the list of those approved to operate into MHTG. High rates of descent on final are common.

To grade the severity of the exceedance the Committee considers, stabilised approaches, long flares, speed control, rates of descent.

There is no specific simulator training for TGU. Discussions have taken place regarding this issue but no formal meeting nor cost/benefit analysis to assess the need was apparent. Captain Soto indicated that an accurate geodetic model of the local terrain was not available and indicated cost of purchasing the simulator software was an issue.

There is no specific training for first officers flying to TGU. Two years ago all pilots got a CD copy of the training briefing that Captain Soto had produced. As the FO was new he would not have had this information supplied to him and would not have had a briefing. Captain Soto stated it was difficult to schedule the rosters to allow sufficient time for the ground school. The ground school training for TGU takes approximately 1 hour. However crew scheduling to complete training appeared to be an issue of some significance

All instructors receive both left and right seat training. As per normal quality assurance the instructors are audited by the local authorities.

There is similar 'specific' training for Quito and Guatemala. Airports are graded in the Ops Manuals as A, B and C with C being the most difficult. MHTG is considered a C due to the mountainous terrain.

The ground school training documentation for Initial TGU operation is not reproduced in the Operator's formal documentation.

Approx 20-25 pilots are approved for TGU.

With regards to CRM Captain Soto considered the Airbus cockpit philosophy potentially improved the captain/first officer relationship.

TACA have provided a number of documents pertinent to the operations including the flight plan, load sheet etc

A Line Operations safety audit (LOSA), University of Texas gave positive results. It highlighted cockpit interference (stewardess, mechanics etc), limited use of weather radar and terrain briefings as areas for improvement.

Captain Soto confirmed that most of the landing brief was included in the pre-flight briefing due to the limited flight time available on short flight legs. Should circumstances change en-route he confirmed that it was not normal practice to come out of the landing pattern to re-calculate runway performance.

In addition the standard procedure for landing performance at MHTG was to check the max landing weight for RWY 20 as this is the limiting runway. The MLW does not appear to be subsequently checked.

Crew check-in is 1 hour before dispatch. They are required to be on the aircraft 45 mins before dispatch. There are no requirements for an earlier check-in for MHTG flights although the approach briefing has to be partly conducted prior to flight.

The flight plan indicates that max auto-brake is required for MHTG which conflicted with the initial MHTG training documentation which stated that medium braking should be used. Captain Soto indicated this statement in the flight plan was incorrect. He clarified that it is the duty of the captain of the flight to use braking power as required. There did not appear to be any emphasis in procedures to check on landing performance while en-route or prior to landing.

Captain Soto was asked for his opinion of Captain Cesare D'Antonio's performance and character. He was described as potentially over-confident. In 2005 he was de-moted to first officer for his attitude to appearance (not wearing his cap, tie) in line with company requirements. He was aware of another issue regarding a stabilised approach but was not familiar with all the circumstances.

Captain Soto did not know the first officer.

Within TACA a maximum of two approaches are permitted before diverting to the alternate airport.

When questioned about the requirement in his training notes to "Brief loss of braking procedure" Captain Soto made reference to the standard procedure for loss of braking performance and indicated that part of this procedure was a brief application of the parking brakes.



Adobe Acrobat 7.0
Document

Landing Performance

The relevant METAR conditions about the time of the accident were:

MHTG 301500Z 19004 2000S -DZ FEW008 BKN020 OVC080 21/19 Q1016
2KM S SW WSW DC 8KM PCPN CL HZ

MHTG 301600Z 20009 3000SW -DZ FEW006 BKN020 OVC080 22/19 Q1017
3KM SW WSW W 8KM CTE E PCPN CL D/C UNL HZ

Performance using the above data was obtained from Taca Airlines. The Landing Performance for RWY 02 shows that for the conditions above the maximum landing weight on RWY 02 in dry conditions with a –10 knot tailwind component was 59,200 kgs. In wet conditions, it was 48,900 kgs.

The following indication ***** means that a landing is not allowed in this condition

Table XX

OAT		TAILWIND				WIND			
C		-10 KT				0 KT			
		DRY		WET		DRY		WET	
		AIR COND.		AIR COND.		AIR COND.		AIR COND.	
		On		OFF		On		OFF	
26	59.2 129 2	59.2 129 2	48.9 117 2	48.9 117 2	66.3 137 2	66.3 137 2	59.7 130 2	59.7 130 2	
	3246/ 5409	3246/ 5409	*****/ 5409	*****/ 5409	3246/ 5409	3246/ 5409	*****/ 5409	*****/ 5409	
24	59.2 129 2	59.2 129 2	48.9 117 2	48.9 117 2	66.3 137 2	66.3 137 2	59.7 130 2	59.7 130 2	
	3246/ 5409	3246/ 5409	*****/ 5409	*****/ 5409	3246/ 5409	3246/ 5409	*****/ 5409	*****/ 5409	
22	59.2 129 2	59.2 129 2	48.9 117 2	48.9 117 2	66.3 137 2	66.3 137 2	59.7 130 2	59.7 130 2	
	3246/ 5409	3246/ 5409	*****/ 5409	*****/ 5409	3246/ 5409	3246/ 5409	*****/ 5409	*****/ 5409	

Landing performance for RWY 02

The Load sheet information showed the landing weight at 64,389 kgs with a maximum of 64,500, an under load of 111 kgs. While it was not possible to weigh the aft hold baggage weights the forward hold was weighed and 1,089 kgs were recorded, a difference of +68 kg thus reducing the under load to 43 kgs. The group is awaiting confirmation of total fuel on board at the time of the event.

4/ Runway Observations

The group accompanied the other groups on a visual inspection of the runway.

Definite black tier marks of varying intensity leading to ground scars beyond rwy and of the cliff,

Tyres # 1, 2 and 3 were darker than 4 in the final 700 feet (this distance is approximate).

The group was unable to establish the touchdown point.

The runway was recently resurfaced, has a displaced threshold of 799 feet and has non standard markings. The runway is not grooved. The distance from the end of the runway to the cliff edge is very limited (approximately 30 feet).

There is a small edging approximately 10 ft after the end of the runway, which showed impact marks from the left main gear and nose gear. A wire fence, supported by metal poles inset in a cement base, protects the cliff edge. This fence was broken by the passage of the airplane.

The group formally requested a friction coefficient report on the runway before and after the accident, both for wet and dry conditions. The official correspondence was received. We understand the coefficient of friction was not measured before or after the re-surfacing.

The following table records the coordinates of various positions, which were of use to the investigation. The positions were recorded using a non-differential GPS unit.

Table

Runway 02 End	N14°04.164'	W087°12.846'
Concrete kerb	N14°04.170'	W087°12.843'
Edge of cliff	N14°04.175'	W087°12.841'
Tail cone point	N14°04.196'	W087°12.835'
Nose	N14°04.216'	W087°12.830'
Left Wing	N14°04.210'	W087°12.843'
Right wing	N14°04.204'	W087°12.823'
Engine 2 Impact	N14°04.207'	W087°12.831'

GPS coordinates recorded on 06 June 2008

5/ Interview with the ATC controllers

Note. The tower voice recording (in Spanish) has been made available to the investigation team.

The ATC controllers who were on duty on the day of the accident were interviewed.

ATC APP in MHTG

Wilfredo Flores

ATS Planner

ATC APP in MHTG
Controller Javier Padilla

ATC Tower in MHTG
Ricardo López

ATC Tower in MHTG
Jorge Perdomo

ATC Tower in MHTG
Ramon Moncada
Supervisor

They were interviewed and all of them agree that the a/c operation seems normal (approach and touchdown), two of the controllers pointed out a possible touchdown point, which is between E taxiway and the control tower. The Approach Controller mentioned that the a/c did a Missed Approach because the visibility on the north side was inadequate when the flight was doing the circling approach for runway 20. For the next approach due to the bad weather, the pilot decided to change the RWY and land with a tailwind. All their reports were consistent with each other. The team requested a written report from all of them. All the ATC controllers confirmed that they informed the TAI 390 of the tailwind (approximately 10 knots) and wet conditions of the runway.

6/ Interview of security personnel that were on duty the day of the accident

Elias Abraham

Carlos Caballero

They were separately interviewed and agreed that the a/c appeared to touchdown almost in front of the control tower. Elias observed the a/c until it disappeared and Carlos went back to his newspaper. Elias reported that he saw the nose stay in the air for long time. Otherwise they stated that the operation seems normal. Neither witness reported evidence of thrust reverser usage.

7/ Passenger Comments

Passenger described the landing as smooth (passengers clapped).

Interview of passengers

Jaime López

Citizenship: Venezuela

Cel. in CRC (506) 8-387-4937

Of in CRC (506) 2-281-015

e-mail: jlopez@mpgca.com

Seated in 22d

Guido Alpízar

Citizenship: Costa Rica

Cel in CRC (506) 8-860-5623

e-mail: alpinneck@racsa.co.cr

Seated in 22e

Enrique González

Citizenship: México, passport # 07050055393

Cel in CRC (52) 1871-736-1852

e-mail: jenrique-j-gonzalez@vfc.com

Seated in 19a

NOTE:

For Jaime López and Guido Alpízar, we requested only their contact information for future questioning, Enrique González was taped


8/ Weather

The weather was quoted as light drizzle prior to touchdown (enough to make clothes feel damp) but was clear at the time of landing. The video recordings from the three airport cameras show surfaces as wet.

Aviation Digital Data Service (ADDS)

Output produced by METARs form (0314 UTC 31 May 2008)
 found at <http://adds.aviationweather.noaa.gov/metar/index.php>

MHTG 310800Z 13002KT 4000 +DZ BRN615 OVC080 19/19 Q1017 VIS 4 KM TDS PCPN NOSIG
 MHTG 310800Z 00000KT 5000W 5000WSW -DZ FEW005 SCT020TCU BRN680 19/19 Q1017 5 KMS
 WSW W D/C 8 KMS PCPN CL TCU SW FEW012 NOSIG
 MHTG 310100Z 16004KT 3000W 3000WSW VCSH FEW012 BRN018TCU 20/19 Q1018 3 KMS WSW W
 5 KMS E PCPN CL D/C UNL TCU SSE W SCT080 NOSIG
 MHTG 310900Z 19005KT 3000SW 3000WSW VCSH FEW004 BRN018TCU OVC080 20/19 Q1018 3
 KMS SW WSW W 8 KMS E PCPN CL D/C CL ICU E S W FEW012 NOSIG
 MHTG 302300Z 19006KT 3000SW 3000WSW -DZ FEW004 BRN020TCU OVC080 21/19 Q1015 3
 KMS SW WSW W 8 KMS E PCPN CL D/C UNL TCU E S FEW012 NOSIG
 MHTG 302200Z 18005KT 3000SW 3000WSW -RA FEW004 BRN020TCU OVC080 22/20 Q1015 3
 KMS SW WSW W D/C 8 KMS PCPN CL TCU SW NOSIG
 MHTG 302100Z 18006K 3000SW 3000WSW -RA FEW003 BRN020TCU OVC080 21/18 Q1015 3 KMS
 SW WSW W D/C 8KM PCPN CL TCU W NOSIG
 MHTG 302000Z 19007KT 3000SW 3000WSW -RA BRN020TCU BRN080 22/20 Q1015 3 KMS SW
 WSW W 7 KMS E PCPN CL D/C UNL TCU SW WSW NOSIG
 MHTG 301900Z 19009KT 9999 3000SW -DZ BRN020CU OVC080 23/19 Q1015 3KM SW WSW W
 7KM CTE E VCSH CL D/C UNL TCU SSE SSW SW NOSIG
 MHTG 301800Z 20009KT 9999 2000SW -DZ BRN020TCU OVC080 22/19 Q1016 3KM SW WSW W
 7KM CTE E VCSH CL D/C UNL TCU CTE E
 MHTG 301700Z 18005KT 9999 3000SW VCSH BRN018 OVC080 22/19 Q1017 REDE 3KM SSW SW
 7KM CTR W VCSH CL D/C UNL
 MHTG 301600Z 20009KT 3000SW -DZ FEW006 BRN080 OVC080 22/20 Q1017 3KM SW WSW W
 8KM CTE E PCPN CL D/C UNL HZ AVION DE TACA ACCIDENTADO EN LA PISTA 19 EN EL
 AEROPUERTO TONCONTIN
 MHTG 301500Z 19004KT 2000S -DZ FEW008 BRN020 OVC080 21/19 Q1016 2KM 3 SW WSW D/C
 8KM PCPN CL HZ
 MHTG 301400Z 18004KT 3000SW -DZ FEW006 BRN020 OVC080 20/19 Q1016 3KM SW WSW SW
 D/C 8KM PCPN CL HZ NOSIG
 MHTG 301300Z 06000KT 3000S -DZ FEW008 BRN020 OVC080 19/19 Q1015 3 KM S D/C 8KM
 PCPN CL HZ
 MHTG 301200Z 06000KT 3000 S DZ FEW009 BRN020 OVC080 19/19 Q1015 3 KM S D/C 6 KM
 CL PCPN HZ
 MHTG 301100Z 060000KT 6000 FEW006 BRN020 OVC080 19/18 Q1014 6 KM TD PCPN CL
 MHTG 301000Z 04002KT 6000 -RA FEW002 BRN020 BRN080 19/15 Q1014 6 KM TD PCPN CL



AUTORIDAD DE AVIACIÓN CIVIL
Car. 98, Ciudad Panamericana, Depto. de San José, Costa Rica
Tel: 2233-6400 Fax: 2236-9343

LISTA DE VERIFICACION GRUPO CONDICIONES METEOROLOGICAS

INDICADOR	CONTRAVENCIONES	SI	NO
1. Procedimiento de aterrizaje	Procedimiento de aterrizaje que no cumple con el 100% de las condiciones para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Procedimiento de despegue	Procedimiento de despegue que no cumple con las condiciones para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sistema de ATIS	CANTON: 2000-02-01-01-01-01-01	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. INSTRUCCIONES	Por el sistema de comunicación	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. VOLUMEN	Suma de los niveles de potencia de motores de reacción de potencia para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Manejo de ATIS	Información de ATIS	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Manejo de ATIS (SPEL)	Manejo de ATIS (SPEL)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. ATIS	El ATIS debe ser leído y entendido	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Procedimiento de ATIS	Procedimiento de ATIS que no cumple con las condiciones para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Procedimiento de ATIS	Procedimiento de ATIS que no cumple con las condiciones para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. Visibilidad	Visibilidad que no cumple con las condiciones para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Dirección y velocidad del viento		<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Temperatura		<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. Punto de rocío		<input checked="" type="checkbox"/>	<input type="checkbox"/>
15. Humedad		<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. Manejo de ATIS (SPEL) para el tipo de avión	Manejo de ATIS (SPEL) para el tipo de avión	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17. TRATAMIENTO DE ATIS		<input checked="" type="checkbox"/>	<input type="checkbox"/>
18. Tipo de información que se reporta en la información	<ul style="list-style-type: none"> Para la información de vuelo Para la información de vuelo Para la información de vuelo Para la información de vuelo Para la información de vuelo 	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19. Fuente	<ul style="list-style-type: none"> Para la información de vuelo Para la información de vuelo Para la información de vuelo Para la información de vuelo Para la información de vuelo 	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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9 Camera Security Video Recordings

The team reviewed the video recordings supplied by the airport. The picture quality is poor. Three instances of the landing aircraft were observed on the airport security cameras: These recordings show a visible water spray with the aircraft in the landing configuration with spoilers extended.

The landing appears normal. Spray is evident from main landing gear. Thrust reverser deployment is evident. Spoiler and flap deployment is evident.

10/ Tower voice recording

The tower cockpit voice recording and transcript are available to the investigation team (in Spanish).

Of note the captain can be heard making reference to the max 5 knot tailwind on the initial approach to RWY02. After that, throughout the aircraft/tower dialogue, reference is made to 7 and 10 knot tailwind

11/ FOQUA recording

Two observers from the CAA of Ireland (IAA) observed the full recordings in San Salvador. They stated that the aircraft made three approaches:

1. An initial approach that intercepted and joined the 198° VOR radial at 9,000 feet which was followed by a go-around.
2. A full instrument VOR approach procedure, a procedural turn back which resulted in the aircraft being too high and a consequent go-around.
3. A visual approach and a fast and late touchdown.

Two EICAM messages were observed late in the landing run just before the recording ended:

1. Autobrake fault
2. Antiskid/NWS fail.

12/Follow up

Confirm fuel on board at time of accident

Accuracy of airport anemometer & certification

Licences of ATC controllers on duty at time of accident

Check for any available radar recordings – civil or military

Hours for First Officers – details given to Capt. Miguel Mojica

Resolve the difference between ATC controllers report that one approach was made to RWY 20 and IAA observers report that all three approaches were made to RWY02

LOSA copy requested from Capt Soto

ATC transcription into English

CVR translation into English