Islamic Republic of IRAN

Civil Aviation Organization

Incident Final Report

State File Number:	**I139201299MXAC**
Type of Occurrence:	**Incident (RWY Excursion)**
Date of Occurrence:	**April 18th 2013**
Place of Occurrence:	**I.R.IRAN**
Aircraft Type:	**A340-300**
Registration:	**9M-XAC**
Operator:	**Air Asia**

Safety & Accident

Investigation Department

Date of Release: 2013-04-08

Islamic Republic Of Iran

Civil Aviation Organization

Safety & Aircraft Accident Investigation Department

Final Report

Basic Information

State File Number: I139201299MXAC

Type of occurrence: Incident (Runway Excursion)

Date of occurrence: April 18th 2013

Place of occurrence: on RWY 30L, Tabriz INTL Airport (OITT) Islamic republic of Iran

Aircraft Model: A340-300

Registration: 9M-XAC

Operator: Air Asia

Lessor: Saudi Arabian Airlines

Civil Aviation Organization of I.R. of Iran
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Contents:

Foreword:

According to Aircraft Accident Investigation ICAR 113 of Civil Aviation Organization of the Islamic Republic of Iran,

- Accident investigation shall be conducted separately from any judicial, administrative disposition, administrative lawsuit proceedings associated with civil or criminal liability.

Base on Annex 13 to the Convention on International Civil Aviation, Chapter 3, Paragraph 3.1, and Chapter 5, Paragraph 5.4.1; it is stipulated and recommended as follows;

- The sole objective of the investigation of an incident or accident shall be the prevention of incidents and accidents. It is not the purpose of this activity to apportion blame or liability.

- Any judicial or administrative proceedings to apportion blame or liability should be separated from any investigation conducted under the provisions of this Annex.

Abbreviations:

A/C	Aircraft
ACN	Aircraft classification number
AIP	Aeronautical Information Publication
BEA	Bureau d'Enquête et d'Analyses pour la sécurité de l'aviation civile
CAO	Civil Aviation Organization
CAS	Calibrated Airspeed
FCOM	Flight Crew Operation Manual
FCTM	Flight Crew Training Manual
FDR	Flight data recorder
FO	First Officer
GMT	Greenwich Meridian Time
GS	Ground Speed
IRI	Islamic Republic of Iran
KSA	Kingdom of Saudi Arabia
MTOW	Maximum Take- off weight
PIC	Pilot in Command
PF	Pilot Flying
PCN	Pavement classification number
QAR	Quick Access Recorder
RWY	Runway
SOP	Standard Operation Procedure
TWY	Taxi Way

Synopsis:

On 18 April, 2013 (05:25 UTC), the aircraft A340-313, registration 9M-XAC, operated by Air Asia performing Flight No. SVA 2869 (Leased by Saudi Arabian Airline) from Tabriz INTL Airport (OITT) to Medina Airport (OEMA) started the engines and was cleared to take off from RWY30L. During back track on this RWY, the aircraft involved an incident and the nose wheels of aircraft slide off RWY edge, and stuck in the mud. Finally the passengers were disembarked.

The following actions are taken:

- The aircraft NLG was inspected by the onboard mechanic and reported no damages.
- The CVR was downloaded and the audio files are available. Some conversations between the crew are in their native language.
- The investigation team did not remove FDR to prevent delay for the aircraft departure and download of the FDR was done in Singapore. Flight Data Analysis with related safety report was sent to IRI CAO.
- All the relevant information from ATC, Aerodrome&…were immediately requested in order to follow the process of investigation.

The Aircraft Accident Investigation Department of I.R of Iran Civil Aviation Organization began the incident investigation. Also an independent safety report was sent to IRI CAO by Air Asia Safety Department which was used as a reference for publishing this investigation report.

1. FACTUAL INFORMATION:

1.1 History of the Flight:

On 18 April, 2013 (05:25 UTC), the aircraft A340-313, registration 9M-XAC, operated by Air Asia performing Flight No. SVA 2869 (Leased by Saudi Arabian Airline) from Tabriz INTL Airport (OITT) to Medina Airport (OEMA) started the engines and was cleared to take off from RWY30L. The aircraft began for 180° turn on runway 30L. Initial clockwise turn (as per SOP) was aborted due skidding during the turn. The crew realized that there was insufficient area to continue a clockwise turn; an anti- clockwise turn was executed.

Uncertain of the obstacles clearance on the anti-clockwise turn, marshaller was requested to assist. Marshaller instructed to continue on the anti-clockwise turn.

Aircraft skidded again; nose wheel departed the runway edge and got stuck in the soft ground after 110° on the turn. Final aircraft heading was 040.

1.2 Injuries to Persons:

According to the information provided by the airline, 13crew and 295 passengers were on board. No injuries were reported.

1.3 Damage to Aircraft:

The aircraft was inspected by the onboard mechanic and reported no damages .

1.4 Other Damages: None

1.5 Personnel Information:

1.5.1 Pilot Flying :(Left Hand Seat)

- Pilot in command
- Male, 53 years old, Malaysian Nationality
- Commercial pilot, ATPL (A) No.1144 Class 1, from Malaysia DCA
- Type rating: A340
- Valid Medical Certification
- Total flight time: 19178H
- Flight time on type: 675 H

1.5.2 Pilot None Flying: (Right Hand Seat)

- First Officer
- Male, 27years old, Malaysian Nationality
- Commercial pilot, CPL (A) No.3399 Class 1, from Malaysia DCA
- Type rating: A330/A340
- Valid Medical Certification
- Total flight time: 3612 H
- Flight time on type: 203H

1.6 Aircraft Information:

The Airbus A340-313, S/N; 278 aircraft with registration 9M-XAC was manufactured in 1999. The Maximum Take-off weight of this aircraft is 275000 kg. It had airworthiness certificate No; M.1292, valid until 11 June, 2013 and issued Malaysia Department of Civil Aviation.

A review of recent records of the aircraft did not show any significant related malfunctions. The aircraft was operated by Air Asia and has flight permission from General Authority of Civil Aviation, KSA to perform flight between Kuala Lumpur (KUL) to Jeddah (JED) but performed Hajj flights by Air Asia and Saudi Arabian Airline agreement.

1.6.1 Normal Technique of 180^0 turn of the Aircraft:

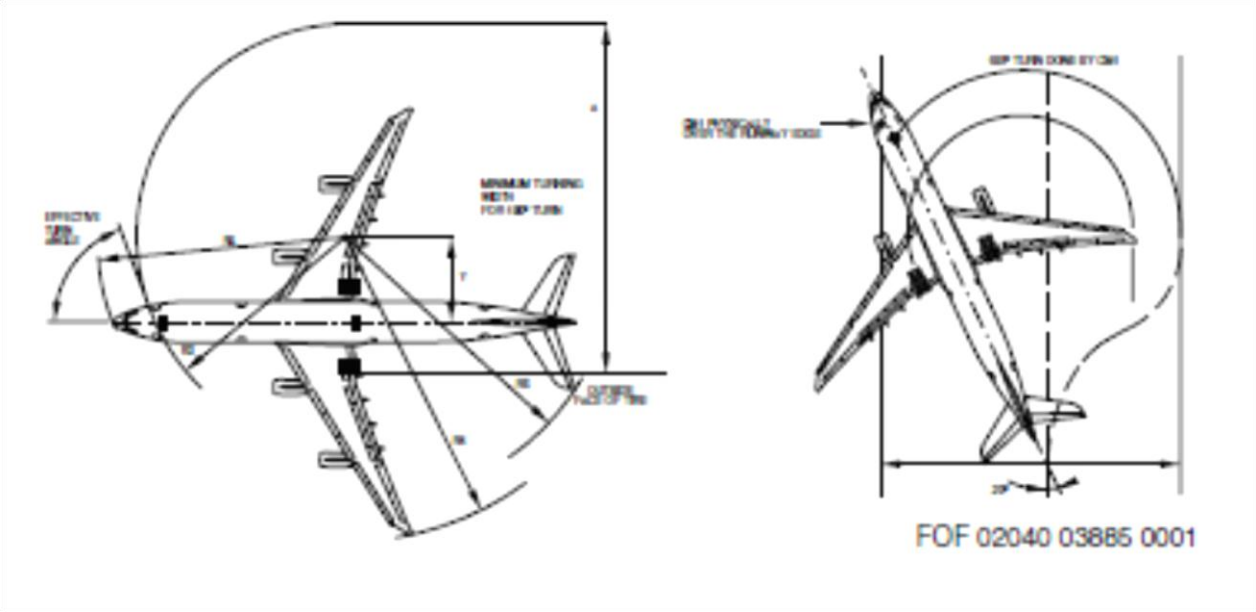
According to aircraft FCTM, in order to make an effective 180-degree turn, the Captain should proceed as follows:

- *Taxi on the right-hand side of the runway, and turn left to establish a 20-degree divergence from the runway axis (using the ND or the PFD). The maximum ground speed is 10 knots.*
- *When the aircraft is physically over the edge of the runway, smoothly initiate a full-deflection turn to the right.*
- *Asymmetric thrust should be used during the turn. Anticipation is required to ensure that asymmetric thrust is established, before starting the turn[50%N1 or 1.05EPR], in order to maintain a continuous speed of approximately 8 knots throughout the maneuver.*
- *During the turn, it is essential to maintain minimum ground speed. This will avoid the need to significantly increase thrust, in order to continue moving. When the aircraft is*

turning, the PNF should observe the ND, and call out the indicated Ground Speeds (GS)

- *Differential braking is not recommended, to prevent stress on the landing gear assembly. In addition, a braked pivot-turn is NOT permitted (i.e. braking to fully stop the wheels on one main gear).*
- *When turning on a wet or contaminated runway, (and to be more specific, when turning on the white or yellow marking that is painted on the runway) tight turns can cause the nose wheel to jerk. This can be noisy and uncomfortable.*
- *The First Officer symmetrically performs the procedure (i.e. Taxi on the left-hand side of the runway).*

AIRCRAFT DIMENSIONS



MSN 0002-0003 0005 0007 0013 0015-0016 0020 0023-0025 0027-0029 0032-0035 0039-0041 0044 0047-0049 0051-0053 0056-0058 0076 0078-0079 0084 0088-0094 0097 0101 0103-0104 0114-0115 0117 0123-0126 0128-0131 0133-0137 0139 0141-0142 0145-0147 0149-0150 0152 0154 0157-0158 0160-0161 0163-0164 0166-0170 0173-0176 0179-0180 0182 0185-0187 0190 0192-0194 0196-0197 0199 0201-0202 0207-0208 0210 0212-0218 0220-0221 0225 0227-0228 0233 0235-0237 0239 0242-0243 0245-0246 0252 0257 0260 0263-0264 0268 0270 0273-0274 0278 0280 0282 0292 0297 0302 0304 0307 0310 0318-0319 0321 0325 0327 0329 0331-0332 0335 0347 0352 0354-0355 0359 0363 0367 0373-0374 0377-0379 0381 0385 0387 0390 0395 0399 0402 0406 0411 0413-0415 0424 0429-0430 0433-0435 0438 0442 0446-0447 0450 0459 0467 0470 0474 0483 0528 0538 0541 0544-0546 0554 0556 0559 0561-0562 0582 0585 0590 0598 0643 0646 0651 0668 0793 0800 0835 0844

Y	R3	R4	R5	R6	NWS Limit Angle	Minimum Runway Width with Asymmetric Thrust
13 m 43 ft	29 m 100 ft	44m 144 ft	35 m 114 ft	39 m 128 ft	72 degrees	**45 m** **148 ft**

With the maximum nose wheel steering angle (72 °), the actual turn width (**without margin**) is [..] 45 m for an A340-300." This distance is based on the attached procedure provided in the FCOM and considering favorable circumstances, in particular dry and good condition runway.

- *Therefore, to verify the required runway width, some margins must be added to the turn width considering in particular the runway condition.*

1.7 Meteorological Information:

The related aviation routine meteorological reports (METAR) in Tabriz airport on 18/04/2013 were issued as following:

METAR: 05:00 UTC

Wind: 030/4KTS
Visibility: over 10 km
Cloud: Few 4000 ft
Temp: 09 deg c
Dew point: 06 deg c
QNH: 1012 MB

According to weather report on incident time (05:25 UTC), there was raining on the airport field.

1.8 Aids to Navigation:

No problems with any navigational aids were reported.

1.9 Communications:

No technical communications problems were reported by the flight crew or any of the air traffic controllers who handled the accident flight.

1.10 Airport Information:

This incident happened in Tabriz International Airport field. ARP coordinates and site at Aerodrome 380802N 0461406E. The airport is located at, 4 NM from Tabriz in North West of I.R of Iran. The airport has two runways as RWY 12L/30R and RWY 12R/30L.
At the time of incident RWY 30R/12L had been closed due to construction work so aircraft departure has been done via back track from RWY 12R/30L. The related NOTAM of the airport is:

TEL: +98 21 66025108
FAX: +98 21 44649269
TELEX: 213889 EPDIR
AFTN: OIIIYNYX
Web Site: *http://ais.airport.ir*
Email: *ais_iran@airport.ir*

ISLAMIC REPUBLIC OF IRAN
IRANIAN AIRPORTS COMPANY
ATS GENERAL DEPARTMENT
AERONAUTICAL INFORMATION SERVICES
P.O.BOX:13445-1558, TEHRAN, IRAN

NOTAM LIST
Series (A)
29-Apr-13
All times in UTC

TABRIZ INTL.OITT

A0214	130126	1301261023/1305261000 EST RWY 30R/12L CLSD DUE TO CONST WORK.
A0217	130126	1301261111/1305261000 EST TWY D AND F CLSD DUE TO CONST WORK.
A0295	130202	1302020522/1305261000 EST REF NOTAM A0214/13, DELAY MAY OCCUR TO ALL TRAFFIC, CTN ADZ.
A0684	130310	1303101005/1306100935 EST WIP BOTH SIDES AND ADJESCENT TO THE RWY 30R/12L, CTN ADZ.
A0685	130310	1303101007/1306100940 EST 2 NET BARRIERS EXIST AT THE BEGINING OF RWY 30L/12R, DISTANCE FM EACH THR: 314M, HEIGHT: 10FT. THERE ARE TWO METAL BOXES ON BOTH SIDES OF EACH BARRIER WITH FOLLWING SPECIFICATION: DIMENSION: 2.5M*2.5M DISTANCE FM RWY CL: 49M HEIGHT:8 FEET DISTANCE FM THR: 314 M
A0686	130310	1303101012/1306100930 EST LLZ 30R ITBZ 109.900 MHZ AND GP RWY 30R ITBZ CH 36X OFF THE AIR DUE TO RWY 30R REPAIRMENT.
A0873	130331	1304010000/1306302359 EST ILS/DME RWY 30R ITBZ CH 36X FLTCK EXPIRED.
A0913	130407	1304070630/1307070620 EST ALL TWY LGT EXCEPT TWY A,B,C AND G U/S CTN ADZ.
A0925	130408	1304080640/1306200600 EST FUEL 100LL NOT AVBL.
A0964	130410	1304101113/1307101030 EST ALL STANDARD INSTRUMENT DEPARTURE CHARTS (SID) ARE USABLE FOR RWY 30L/12R.

In the Iranian Aeronautical Information publication (AIP) the strength of the available RWY (PCN) was published as:

OITT AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	*TRUE BRG*	*Dimensions of RWY (M)*	*Strength(PCN) and surface of RWY and SWY*	*THR coordinates* *THR geoid undulation*	*THR elevation and highest elevation of TDZ of precision APP RWY*
1	2	3	4	5	6
12L	128.96°GEO	3655 x 45	70/F/D/X/T Asphalt	380838.35N 0461309.69E GUND 56 FT	THR 4448 FT
30R	308.98°GEO	3655 x 45	70/F/D/X/T Asphalt	380723.96N 0461506.60E GUND 56 FT	THR 4459 FT
12R	129.00°GEO	3757 x 45	60/F/C/X/T Asphalt	380834.55N 0461303.82E	THR 4448 FT
30L	309.00°GEO	3757 x 45	60/F/C/X/T Asphalt	380718.09N 0461503.96E	THR 4458 FT

Pavement classification number of the RWY 30L/12R is 60. According to Annex 14, PCN number is expressing the bearing strength of a pavement for unrestricted operations by aircraft with Aircraft classification number (ACN) value less than or equal to the PCN. According to Specific ACN values for this aircraft, A340-300 with MTOW 275000 kg the safest runway PCN is 74, thus the used RWY had so lower PCN which was not observed by the Operator.

Table 5.1-1: ACN values for various aircraft types operating on flexible and rigid pavements

		ACN							
Aircraft type/ Main wheel configuration	MTOW OWE TP	Flexible Pavement Sub grade CBR%				Rigid Pavement N Sub grade k in MN/m³			
		A 15	B 10	C 6	D 3	A k150	B k80	C k40	D k20
A300-B4 DT	165900 88505 1240	47 21	52 22	63 26	82 34	42 19	50 21	60 25	69 29
A320-200 D	72000 40800 1360	36 19	37 19	41 20	46 23	40 21	42 22	44 23	46 24
A310-200 DT	132900 76890 1080	36 18	39 19	48 22	63 29	31 16	38 18	46 21	53 25
A330-300 DT	212000 121870 580	55 29	60 30	69 33	94 41	47 28	54 27	64 31	75 36
A340-300 DT	271000 129300 1380	59 24	64 25	74 28	100 34	50 25	58 24	69 26	80 30

1.11Flight Recorders:

1.11.1 Flight Data Recorder:

This aircraft has been equipped with SSFDR and SSCVR. The SSFDR was not picked up from relative compartment of aircraft. After departure of the aircraft to Jeddah, KSA, the FDR information was downloaded via QAR and sent to Laboratory in the Singapore. The file contains 508 parameters. The file of the downloaded information was sent to IRI CAO and the parameter evaluation and analysis was done by the investigation team and French Accident investigation Authority (BEA) cooperation.

1.11.2 Cockpit Voice Recorder:

After happening of this incident, CVR was picked up from relatively undamaged compartment of aircraft in a very good condition and was transferred to the Tehran and the read out was successfully accomplished, and again was sent to the Tabriz in order to install on the aircraft to prevent any further delay regarding the departure of aircraft.

1.12 Wreckage and Impact Information:

Not relevant.

1.13 Medical and Pathological Information:

Both pilots are medically fit and hold Class 1 Medical Certificates Licenses. Both pilots did not consume alcohol the day before.

One hour before pick up time, flight was retimed to 7 hours and 45 minutes later. Captain did not have quality rest before flight (see 2.2.1 g, h, i)

During investigation the evidences showed that the criteria for an incident had not been met to test for the presence of alcohol and drugs in the flight for both pilots, therefore, testing was not conducted.

1.14 Fire:

There were no" in-flight or post incident" fire occurred for the aircraft.

1.15 Survival Aspects:

All of the passengers deplaned without incident while the airplane was on the runway. According to the flight attendants reports, there was no sense of urgency to get the passengers off the airplane. The flight attendants stated that the deplaning was orderly and normal via stairs.

1.16 Tests and Research:

Not applicable

1.17 Organizational and Management Information:

Air Asia is Malaysian private airline that offers passenger and cargo services, including domestic and international flights. The company's corporate office is in Lot PT16 Jalan KLIA S7, Southern Support Zone KLIA, 64000 Sepang Selangor Darul Ehsan, Malaysia.

This Airline operates a fleet of more wide body airplanes, consisting of Airbus 330s, 340s;

1.18 Additional Information:

Both pilots were interviewed on 18nd April 2013 on incident site and also in Air Asia safety office.

a. Feedback from the pilots indicate there were only one set of Jeppesen Approach charts available on board the aircraft, and are not always up to date
b. Most pilots resort to using their own IPADs with Jeppesen applications installed, using "uncontrolled" chart database from the open market (P2P torrent download).
c. AMDS for both A340s are not working.
d. Feedback from pilots stressed that some of the airports AAX A340 are being scheduled to fly to, are not exactly suitable for wide-body aircraft. Tabriz is one of them.
e. Feedback from pilots highlighted that the living conditions in Jeddah are not very suitable.

1.19 Useful or Effective Investigation Techniques:

The standard and normal techniques were applied.

2. ANALYSIS:

2-1 Scenario of Events:

The Scenario of events was quoted from the Information gathered from both pilots and Air Asia safety Dep. and Digital Flight Data Recorder (DFDR):

- ✓ Both pilots were scheduled for this flight (night operations).
- ✓ Captain (PIC-PF) had experience of flight into TBZ before. His last flight into TBZ was on 3rd April 2013.
- ✓ A Backtrack for 180° turn to line up on the runway was executed for departure.
- ✓ This was First Officer's (FO) first time operating into TBZ.
- ✓ No official air-field briefing was available for the pilots.
- ✓ Original departure time was 1855LT from JED to TBZ. One hour before pickup, the flight was cancelled by Saudi Arabian Airline.
- ✓ Both pilots were put on standby 2359 (17th April) – 1200 (18th April).
- ✓ One hour later, their duties were changed to same flight, re-timed to morning. New pick-up time was 0040LT.
- ✓ Both pilots rested in the hotel for the original departure time. Captain could not sleep anymore after that. First Officer was able to take a nap after realizing the change of departure time.
- ✓ JED-TBZ flight was normal. However, captain had to request for Circling VOR DME-3 approach chart from Saudi Arabian Operations prior to departure, as he knew this particular approach chart was not available on board the aircraft.
- ✓ The passengers got on the aircraft cabin normally in the TBZ parking area.
- ✓ Engine start performed at 0524 UTC for Medina (TBZ-MED sector).
- ✓ Commenced taxiing at 0528 UTC with TBZ Air Traffic Control (ATC) clearance to line up runway 30L and report ready for departure.

- ✓ Aircraft entered runway via taxiway "A", backtrack for 180^{0} turn to line up RWY 30L for departure.
- ✓ Take-off performance (RTOW) tables for intersection "B" for runway 30L was unavailable. Only full length performance table was available.
- ✓ Captain taxied the aircraft into the runway. Coming close to the end of the runway, he commenced 180^{0}clockwise turn after TWY C position as per Standard Operating Procedure (SOP).
- ✓ Captain did not make much use of the additional space of taxiway "C" because he was particularly concerned about the risk of Foreign Object Damage (FOD) that might cause to engines 1 and 2, as well as the nose wheel during the turn. Of course he did not inform tis subject to ATC.
- ✓ Captain had to make do with the 45 meters runway width available for the 180^{0} turn maneuver; which is the absolute minimum required (without margin with maximum nose wheel steering (NWS) angle of 72^{0}), as per the Flight Crew Operating Manual (FCOM) but due wet RWY 45 Meters is not sufficient Width .
- ✓ Due to the wet runway surface, the aircraft skidded during the clockwise turn.
- ✓ The First Officer indicated to the captain that a tighter turning angle was required. However, the captain replied that they were already at maximum NWS angle.
- ✓ As the aircraft heading came close to perpendicular of the runway heading (210^{0}), the captain realize that they did not have sufficient space to complete the turn. He then changed strategy and commenced an anti-clockwise turn.
- ✓ Before anti-clockwise turn, the captain sensed the most RWY width and realized that the outer left engine (number 4) might not have sufficient clearance to clear the "Jet-blast barrier" at the south-east corner of the runway end. Then the captain requested for a Marshaller's assistance from the control tower.

- ✓ Marshaller arrived within few minutes and helped the pilots to move A/C forward to RWY edge marking and signaled the crew to continue the anti- clockwise turn.
- ✓ Maximum NWS angle turn was performed, but the captain was concern about the actual nose wheel position, where it might go out of the runway surface. However, First Officer reassured the captain that the nose wheel was still within the surface.
- ✓ The First Officer again requested the captain to tighten the turn; however, captain confirmed again they were already at maximum turning angle.
- ✓ Due to low speed of turning, the Captain used engine thrusting to move A/C and the marking of the Nose Wheels on RWY shows 0.3 M the increasing of turn Radios.
- ✓ The captain had to make a slow turn to allow the Marshaller to "run along" so that they could keep visual contact with each other.
- ✓ As the turn progressed with the guidance of the Marshaller, both pilots became very concern of the number 4 engine clearance over the "Jest-blast barrier" and the NWS position.
- ✓ Both pilots agreed to stop the turn as they became very doubtful.
- ✓ Captain brought the aircraft to a complete stop with the final aircraft heading 040^{0}.
- ✓ Pilots requested push back truck for assistance from control tower. Tower replied that they would coordinate.
- ✓ Soon ground services personnel and vehicle came to the aircraft vicinity.
- ✓ Captain requested the travelling engineer to visually inspect the condition on ground, through the aircraft Avionics Compartment Access Door.
- ✓ Then it was discovered that the aircraft nose wheel was already out of the hard surface and landed on soft ground.

2- 2 Airport Restrictions:

- RWY 30R/12L of Tabriz Airport was closed has due to constructional work so back track for 180° turn was used to line up RWY 30L/12R.
- The Airport has not minimum standards for A340 operation.
- There was not suitable Tow bar for A340 aircraft in the airport.
- The RWY surface was wet due to raining in the incident time.

2.3 Flight Data Recorder overviews:

The discovered following findings are based on FDR data:

- The UTC time was not set on FDR recording System.
- The pilot used differential braking while 180^0 turn on the RWY which was not recommended practices according to FCTM.
- During Turn pilot kept Standard engine performance and related Ground Speed (GS).

2.4 findings:

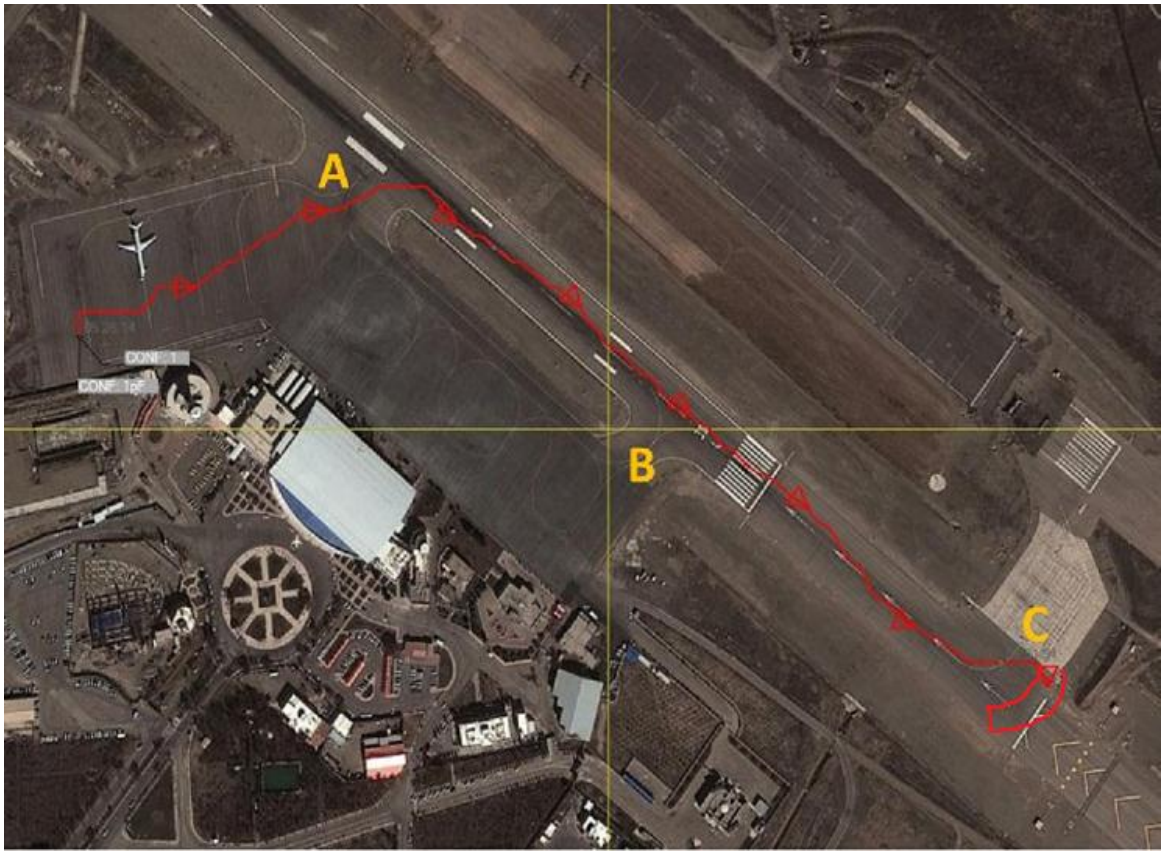
a) It was planned to do the flight (JED-TBZ-MED) at the night on 17 April 2013. The Jeppesen approach charts 10-9 used as reference for flight planning and it clearly indicates that RWY 30L is only available for day light operations. So the flight was rescheduled for next morning on 18 April 2013.

b) No official airfield briefing was available to the pilots. Pilots' knowledge and information related to the operations in TBZ were gathered from other pilots that had been to TBZ.

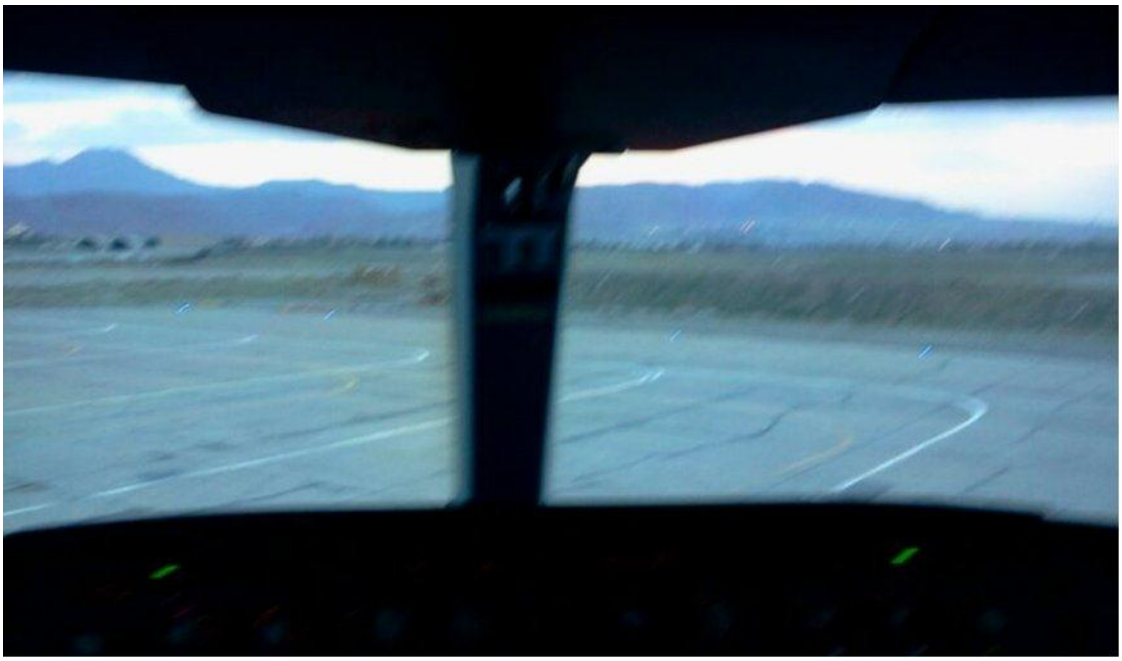
c) Crew did not have proper rest and last minute duty changed was not in accordance of Flight and Duty Time Limitation:

d) No intersection "B" take-off performance table available for runway 30L. Only full length take-off performance table was available. Crew had no other options but to backtrack for 180° turn to line up runway 30L.

e) DFDR approximate position plotting confirms accurate information from both pilots.



f) Captain did not make much use of the additional space of taxiway “C”.



g) 180º turn maneuver on a 45 meters runway width - absolute minimum without margin with maximum NWS angle of 72º(FCOM PRO-NOR-SOP-10 P 9/14)

"A standard runway is 45 m wide. With the maximum nose wheel steering angle 45 m for (72 °), the actual turn width (without margin) is 41 m for an A340–200 and an A340-300"

h) Aircraft skidded during clockwise turn on wet surface. DFDR shows that captain performed 180^0 turn as using Differential Braking against SOP which is not recommended. Ground speed recorded was in the range of 3 knots with asymmetric thrust used. Thus the wet runway surface was the main contributing factor for the skidding.

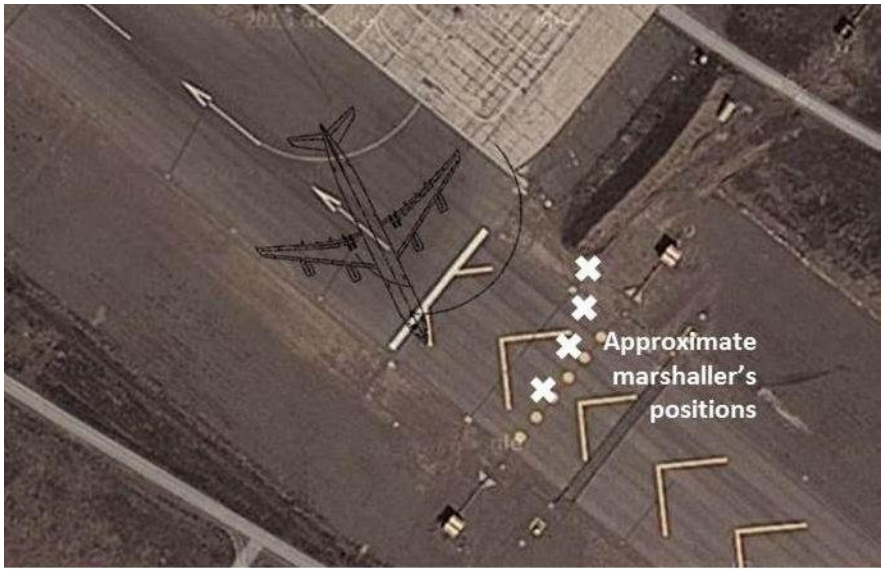
i) Captain requested Marshaller aid to move Nose wheel of A/C to RWY margin to have enough width for the anti-clockwise turn

j) During the anti-clockwise turn, the captain came to realize that the outer left engine (number 4) might not have sufficient clearance over the "Jet-blast barrier" at the south-east corner of the runway end.

k) Aircraft entered into “Pre-Threshold” Area (Chevron Marking).

l) DFDR data divulges that the aircraft was skidding during the anti-clockwise turn. Substantial Left brake pedal input with high engine power settings (up to 55% N1) recorded at the speed of less than 3 knots.

m) The captain had to make a slow turn to allow the Marshaller to “run along” so that they could keep visual contact with each other.



n) As both pilots became very doubtful, the captain brought the aircraft to a complete stop with the aircraft heading 040□.

o) The aircraft nose wheel was out of the hard surface and then landed on the soft ground.

p) No tow bar was available for the A340 aircraft in this airfield for use. After ATC coordinated, a pull operation towing system was available.

3. CONCLUSIONS:

1. According to FCOM runway width of 45 meters was not enough for 180^0 turn on the wet RWY. Maximum NWS angle, 180^0 turn on an absolute minimum runway width of 45 meters (without margin) has no room for error, even in an ideal condition (dry surface, good traction, etc.)
2. The Runway Classification was not suitable for A340 aircraft type.
3. Wet runway surface caused the aircraft to skid during turn.
4. The anti-clockwise turn was made with non-recommended techniques of high thrust settings and inner brakes applied. The captain's intention was to keep minimum turning radius and low speed to avoid skidding, as well as to keep visual contact with the Marshaller. However, the wet surface still caused the aircraft to skid
5. The Pilots claimed their rest was disrupted due to rescheduling of the flight by Saudi Arabian Airline.

- Note: the Crew rest and scheduling is entirely the responsibility of Air Asia

6. No detailed airfield briefing to assist pilot operationally. Unofficial information gathered from other pilots may not be sufficient.
7. No intersection "B" take-off performance (RTOW) table limited pilots' option to only full runway length take-off; which increased time, fuel burn and additional threat of having to make a 180^0 turn to line up for departure.
8. With the wet surface, whichever direction the turn is, with either technique, the aircraft could not have made the 180^0 turn maneuver within the 45 meters width.

4. SAFETY RECOMMENDATIONS:

4.1 To General Civil Aviation of Kingdom Saudi Arabia:

It is recommended to take immediate action to consider the implications of the findings of this investigation on Saudi Arabian Airline operation.

4.2 To Civil Aviation Department of Malaysia:

It is recommended to take immediate action to consider the implications of the findings of this investigation on Air Asia operation and perform effective supervision on its activities.

4.3 To Air Asia:

- ✓ Evaluate Continuing flight data Analysis and Surveillance System program about crew behavior associated with all aircraft fleets.

- ✓ Establish and Implement the "Action Plan for Prevention of the Similar incident" including the followings :
  - Reinforce the education on pilot behavior on SOP, FCOM, avoidance procedures and careful use of the Airport information.
  - Review of flight crews' procedure for efficient and immediate reaction against the similar situation.
- ✓ Air Asia assures that the crew were well within compliance of their FDP
- ✓ Establish annual CRM training for the cockpit flight crew and evaluate its performance and send conclusion to Malaysia DCA.
- ✓ Evaluate DFDR recording system or Pilot Check list for recorded UTC parameter in recording systems.

4.4 To Saudi Arabian Airline:

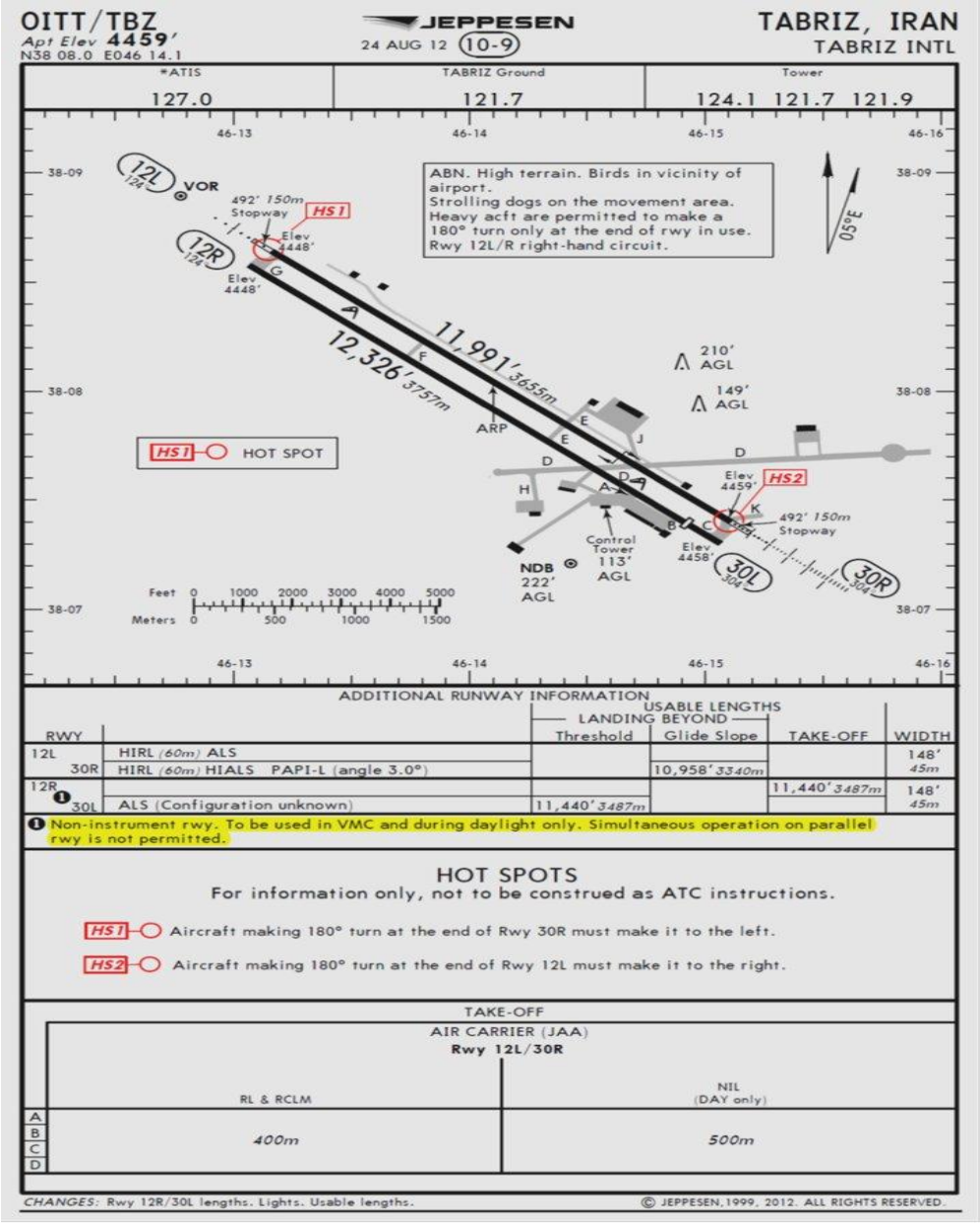
- ➢ Receive all limitations of the destination airports from Iranian Airport Authority then arrange the proportional aircraft fleet for the safe flights.
- ➢ Respect to Operation Manual of Chartered Airlines and study & follow it for flight planning.

4.5 To Air Bus Company:

- To insert warning note in the FCOM for the operators for increasing required Run Way width in the wet & Slippery runway surfaces.

5. Appendices:

- Used Jeppesen Chart
- Communication Between flight and ATC
- Photos of the site
- FCOM related pages for 180^{0} Turn



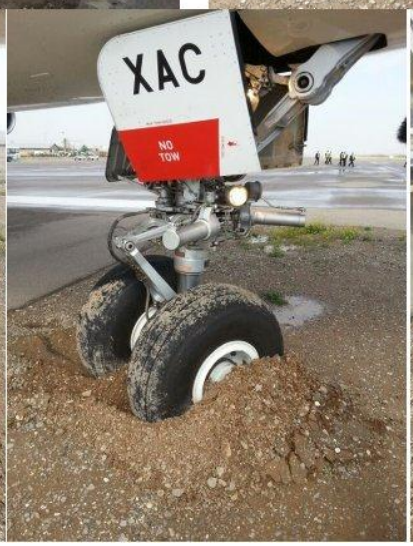
TIME(UTC) Hh/mm/ss	STATION	CONTEXT
0451	SVA2869	TWR good morning SVA 2869
0451	TWR	Good morning SVA 2869
	SVA	SVA 2869 just to confirm do you received on FPL
	TWR	Your FPL time is 0500
	SVA	Call you when ready and request expected SID for departure
	TWR	RUDAD 1E
	SVA	Copied RUDAD 1E SVA2869 thank you sir
	SVA	TWR SVA 2869
	TWR	SVA2869 go ahead sir
0521	SVA	SVA2869 request ATC clearance to Madina FL 370
	TWR	Confirm ready to start
	SVA	That's affirm EOBT 380 SVA 2869
	TWR	Roger stand by for ATC clearance
	SVA	Standing by for ATC clearance and standing by startup clearance
	SVA	TWR SVA2869
	TWR	SVA2869 go ahead
0522	SVA	SVA 2869 request start up
	TWR	Startup approved SVA 2869
0526	SVA	SVA 2869 request taxi
	TWR	Roger SVA 2869 continue use gate A back track and line up30L
	SVA	Taxi via A back track and line up 30L SVA 2869
	TWR	SVA 2869 copy ATC clearance
	SVA	Go ahead SVA2869
0529	TWR	SVA 2869 cleared destination Madina via upper lima 125 climbing initially 290 follow SID RUDAD 1E
	SVA	Cleared to Madina via UL 125 and climing initially FL 290 follow RUDAD 1E departure SQ 5111 SVA 2869
	TWR	Roger read back is correct continue line up RWY 30l report ready for departure SVA2869
	SVA	Roger continue and line up RWY 30l and call you when ready SVA2869
	SVA	TWR SVA 2869
	TWR	Go ahead SVA 2869
0533	SVA	SVA2869 we require to Marshaller
	TWR	roger
0538	SVA	SVA 2869
	TWR	Go ahead SVA2869
	SVA	Marshaller direct …..come here
	TWR	Say again please
0543	PILOT	Do you have push back truck

	TWR	**Roger sir we will coordination push back**
	PILOT	**Any other tow truck coming sir SVA2869**
	TWR	**Say again SVA2869**
	PILOT	**Any tow truck coming push back**
	TWR	**Roger I will coordinate for push back**
	PILOT	**Ok thanks**
0559	**SVA**	**TWR 2869**
	TWR	**Go ahead**
0559	**TWR**	**Station calling Tabriz**
	SVA	**We let to shut down**
	TWR	**Confirm requesting engine shut down**
	SVA	**We shutting down now**
	TWR	**No problem for shut down and we are co-coordinating with push back coming for you**
	SVA	**Thank you very much**
	TWR	**SVA2869 Tabriz TWR**
	SVA	**Go ahead SVA 2869**
0615	**TWR**	**No no just you advice that RWY closed from that time**
	SVA	**Roger**
0617	**SVA**	**SVA2869 how long that it takes tow truck arrive**
	TWR	**Say again please**
	SVA	**How long that it takes to arrive here**
	TWR	**Stand by**
	TWR	**SVA 2869 Tabriz tower**
	SVA	**Go ahead**
	TWR	**Roger be advise flight standard required the last 30 minute that you called me and just they need the recorded tape**
	SVA	**Yes sir we get it and request how long does it take for tow truck to arrive here**
	TWR	**Confirm you requesting tape to record it**
	SVA	**No request estimate for the tow truck**
0901	**TWR**	**SVA 2869 go ahead sir**
	SVA	**الحمد الله I take the nose wheel we think it's now because we need not tow bar and I can taxi start engine back to terminal is it ok?**
	TWR	**Roger stand by please I will advise confirm you have passenger**
	SVA	**We have no passenger only crew on board about 3-2 on board**
	TWR	**Roger no problem**
	SVA	**I will call you when ready for start ok**
	TWR	**You can taxi whit out the tow truck**
	SVA	**Ok thank you very much**
	TWR	**SVA2869 Tabriz tower**
	SVA	**We call you now sir**

	TWR	**Roger start up after vacation by car**
	SVA	**Say again**
	TWR	**Confirm ready for start**
	SVA	**Negative we require another 2-3 minute to start up**
	TWR	**Roger report before starting engines**
	SVA	**Roger we call you**
	SVA	**Tower sav2869**
	TWR	**Go ahead sir**
0909	**SVA**	**We are ready to start up**
	TWR	**Roger start up approved**
	SVA	**Startup approved SVA 2869**
0914	**SVA**	**SVA2869 request taxi**
	TWR	**SVA 2869 follow FOLLOW ME car**
	SVA	**Follow FOLLOWE ME car SVA 2869**
0918	**SVA**	**Tower SVA 2869 we are shutting engine الحمد الله thank you**
	TWR	**Roger thank you**


XAC


XAC
NO
TOW


XAC
NO
TOW