

**FINAL REPORT OF SERIOUS INCIDENT TO M/s JET  
AIRWAYS ATR 72-500 AIRCRAFT VT-JCV AT  
CHANDIGARH AIRFIELD ON 02/03/2012**

1. Aircraft  
    Type : ATR 72-500  
    Nationality : INDIAN  
    Registration : VT - JCV
2. Owner/ Operator : Injet Leasing Company Ltd/Jet Airways
3. Pilot – in –Command : ATPL holder on type  
    Extent of injuries : Nil
4. First Officer : CPL Holder qualified on type  
    Extent of injuries : Nil
5. Place of Incident : Chandigarh Airfield
6. Date & Time of Incident : 02<sup>nd</sup> March 2012 0900 UTC(Approx.)
7. Last point of Departure : Jaipur
8. Point of intended landing : Chandigarh
9. Type of operation : Schedule Operation
10. Crew on Board : 5  
    Extent of injuries : Nil
11. Passengers on Board : 28  
    Extent of injuries : Nil
12. Phase of operation : Landing
13. Type of incident : Aircraft bounced twice after touchdown thereafter carried go around.

(ALL TIMINGS IN THE REPORT ARE IN UTC)

## **SUMMARY:**

On 02/03/2012 M/s Jet Airways ATR 72-500 aircraft VT-JCV operating scheduled flight 9W-2821 (Jaipur – Chandigarh) under the command of pilot holder of Airline Transport Pilot License with Co-pilot duly qualified on the type was involved in a bounced landing incident at Chandigarh. There were 28 passengers and 5 crew members (Including AME) on board the aircraft. There was no fire and no injury caused to any of the occupants on board the aircraft. The incident was reported immediately to DGCA by M/s Jet Airways. The DGCA appointed an inquiry officer to investigate the incident under rule 77C.

The aircraft VT-JCV took off from Jaipur around 0740 UTC, the enroute flight was un-eventful. The aircraft was cleared for landing runway 29 by Chandigarh Air Traffic Control. The weather reported was visibility 8 km with winds 275/14 kts. The aircraft carried out VOR/DME approach for runway 29. Though the approach speed (Vapp) was 103 knots as per the bug card the pilot maintained a very high speeds varying between 128 knots to 122 knots till touchdown which was 20 knots plus than Vapp speed. During flare height the pilot maintained the same high speed with throttles levers not retarded , negative pitch attitude and pitch trim setting nose down as a result the aircraft made a touchdown on the nose landing gear and the right main landing gear with a pitch of  $-1.93^{\circ}$  and vertical 'g' of 1.51. Thereafter the aircraft made couple of bounces on the runway and in the second bounce the vertical 'g' was recorded as 2.68. Subsequently the pilot did a go-around.

On second approach for landing the pilot again maintained speed of about 122 kts well above Vapp with pitch  $-1.93^{\circ}$  and power levers not at idle and were kept at  $43^{\circ}$ . It again resulted into a bounce landing and finally the aircraft settled down on the runway. After landing the aircraft taxied to the bay and the passengers disembarked normally from the rear entry door. There was no injury to any of the passengers. The pilot made an entry in the log book for heavy landing and asked the engineer to carry out heavy landing inspection. During inspection the nose wheel hub was found damaged and the aircraft was grounded at Chandigarh for detailed inspection.

## **1. FACTUAL INFORMATION.**

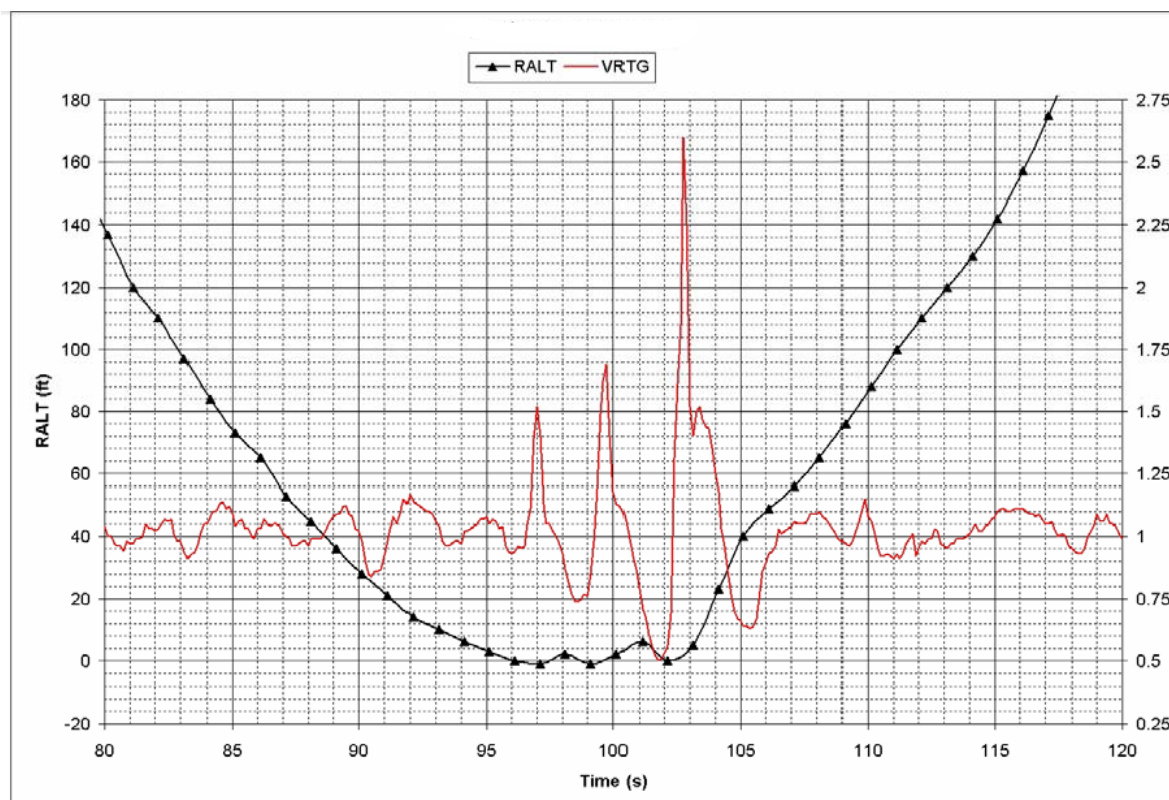
### **1.1 History of the flight**

On 02/03/2012 M/s Jet Airways Ltd. ATR 72-500, VT-JCV, aircraft was operating a scheduled flight from Jaipur to Chandigarh under the command of pilot operating flight under the privileges of Indian FATA (Foreign Aircrew Temporary Authorization) holding an ATPL from CAA, Nepal with duly qualified First Officer on the type. There were 28 passengers and 5 crew members on board the aircraft.

Previous to the incident flight, the aircraft VT-JCV had a night halt at Kolkata. It operated three sectors (Kolkata – Raipur – Indore - Jaipur) prior to the incident flight. There was no defect reported on aircraft by the operating crew, which got down at Jaipur for night halt. Subsequently after the crew change, the aircraft was scheduled for 9W-2821, Jaipur - Chandigarh at around 0730 UTC. The weather at Jaipur was fine, visibility more than 5 kilometers with clear skies. The aircraft took off for Chandigarh at around 0740 UTC. While inbound to Chandigarh, VT-JCV first contacted ATC at around 0830 UTC and reported ETA as 0910 UTC, the ATC gave the complete METAR as clear skies, visibility 8000 meters, winds variable 320/12 knots. Thereafter the Commander requested ATC for runway 29 as this was straight in approach while operating this sector. The ATC asked the commander to reduce speed to around 170 kts as there was an aircraft ahead of them. Subsequently the ATC cleared VT-JCV for VOR-DME approach R/W 29. As per the Commander statement, the platform altitude of 3000 feet was maintained uptill 6 DME thereafter the VOR-DME procedure for Chandigarh was executed as per Standard Operating Procedure at minimums the aircraft was on profile.

As per the bug card Vapp was 99 kts and considering 14 kts head wind the Vapp was calculated by the cockpit crew to be around 103 kts. However as per DFDR at 1000 ft radio altitude it was observed that the pilot maintained very high speed varying between 128 kts to 122 knots which was 20 kts plus above the Vapp speed. The pilot maintained the same speed and the pitch almost till flare height of around 30 ft and the power levers were not retarded as per the SOP during flare. Since the speed was very high by the time the pilot initiated flare the aircraft made

a touchdown on runway surface on nose landing gear and the right main landing gear with a pitch of  $-1.93^{\circ}$  and vertical 'g' of 1.51. After the first impact the aircraft bounced and landed after 02 second with vertical g of 1.68, and thereafter it bounced again after 03 seconds with vertical 'g' of 2.68. Subsequently the pilot initiated a go-around as per the bounce recovery procedure of ATR 72 aircraft.



***Variation of Vertical 'g' during landing and go around***

The cockpit crew after initiating go around climbed to 2500 ft then turned left climbing to 5000 ft and then joined the circuit altitude and then proceeded 8 DME outbound to intercept the VOR radial in order to make second approach and landing. During go around there was a discussion in the cockpit regarding the go around altitude at Chandigarh and procedure. It was also known that prior to the incident flight, the commander had last flown to Chandigarh on 12.01.2012 and the co-pilot had last flown to Chandigarh on 11.11.2011.

During the second approach the pilot asked the first officer to give wind checks along with height. At 50 ft the pilot maintained speed of about 122 kts which was well above the Vapp with pitch of  $-2.90^{\circ}$  and power levers at  $46^{\circ}$ . Just prior to

touchdown the pitch was  $-1.93^{\circ}$  with power levers not retarded as per SOP. Since there was no flare the aircraft bounced again during landing and finally settled down on the runway. The aircraft taxied to the bay and parked normally. The passengers disembarked normally from the rear entry door. There was no injury to any of the passengers. There was no fire. The commander made a PDR (Pilot Defect Report) entry of heavy landing in the technical log book and asked the Engineer to check the aircraft for heavy landing. During inspection the Engineer observed that the right nose wheel flange was damaged and about 90% of inboard side of metallic right nose wheel hub found missing. The aircraft was grounded thereafter for detailed inspection.

### **1.2 Injuries to persons.**

<b>INJURIES</b>	<b>CREW</b>	<b>PASSENGERS</b>	<b>OTHERS</b>
FATAL	Nil	Nil	Nil
SERIOUS	Nil	Nil	Nil
MINOR/ None	Nil	Nil	

### **1.3 Damage to aircraft.**

The right nose wheel flange was damaged. About 90% of inboard side of metallic right nose wheel hub found missing. Right wheel axle sleeve was also damaged.



***Inner Metal Hub of the Nose Wheel Disintegrated during impact***

**1.4 Other damage:** Nil

**1.5 Personnel information:**

**1.5.1 Pilot – in – Command:**

AGE	: 43 years
Licence	: ATPL from CAA, Nepal
Date of Issue	: 18/05/2001
Valid up to	: 30/04/2013
Category	: Aeroplane
Class	: Multi Engine Land
Endorsements as PIC	: ATR 42/320, ATR 42/500 & ATR 72/500
Date of Med. Exam.	: 02/12/2011
Med. Exam valid upto	: 01/06/2012
FRTO Licence No.	: Part of ALTP
Date of issue	: 18/05/2001
Valid up to	: 30/04/2013
Last flown on type	: 01.03.2012

Total flying experience : 8500:00 hours approx  
Experience on type : 5500:00 hours approx  
Experience as PIC on type : 2800:00 hours approx

Total flying experience during last 01 Year : 784:49 hours approx  
Total flying experience during last 180 days : 312:00 hours approx  
Total flying experience during last 90 days : 160:00 hours approx  
Total flying experience during last 30 days : 31:00 hours approx  
Total flying experience during last 07 Days : 05:55 hours approx  
Total flying experience during last 24 Hours : NIL

### **1.5.2 Co-Pilot:**

AGE : 23 years  
Licence : CPL holder  
Date of Issue : 23/01/2008  
Valid up to : 22/01/2013  
Category : Aeroplane  
Class : Single/Multi Engine – Land/Sea  
Endorsements as PIC : Duchess (BE-76)  
Date of Med. Exam. : 24/10/2011  
Med. Exam valid upto : 23/10/2012  
FRTO Licence No. : 11052  
Date of issue : 23/01/2008  
Valid up to : 22/01/2013  
Last flown on type : 01/03/2012

Total flying experience : 1357 hours  
Experience on type : 1104 hours  
Experience as PIC on type : NIL

Total flying experience during last 180 days : 428.30 hours  
Total flying experience during last 90 days : 198 hours  
Total flying experience during last 30 days : 38 hours

Total flying experience during last 07 Days : 07:35 hours

Total flying experience during last 24 Hours : 05:55 hours

### **1.6 Aircraft information:**

ATR 72-500 is a Twin engine aircraft fitted with PW127F/M Engine. The aircraft is certified in Normal category, for day and night operation under VFR & IFR. The maximum operating altitude is 25000 feet (7620 m) and maximum takeoff weight is 22,500 Kgs. Aircraft length is 27.2 meters, wingspan is 27.0 meters and height of this aircraft is 7.6 meters. The Aircraft is approved in the "Normal" category under JAR 25 and ICAO annex 16.

### **Construction:**

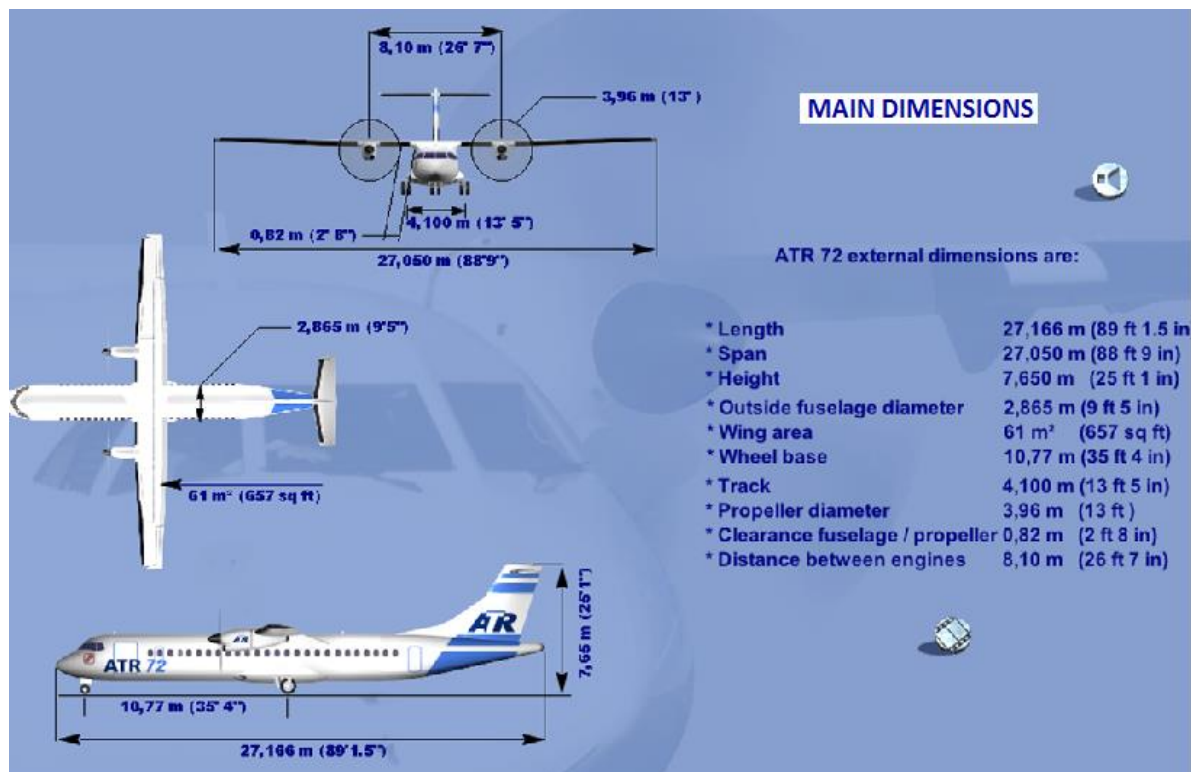
The structure of the aircraft ATR 72-500 is based on Modern Technology and makes wide use of new materials.



***ATR 72-500 is a twin Turbo-prop powered aircraft designed to carry 72 passengers.***

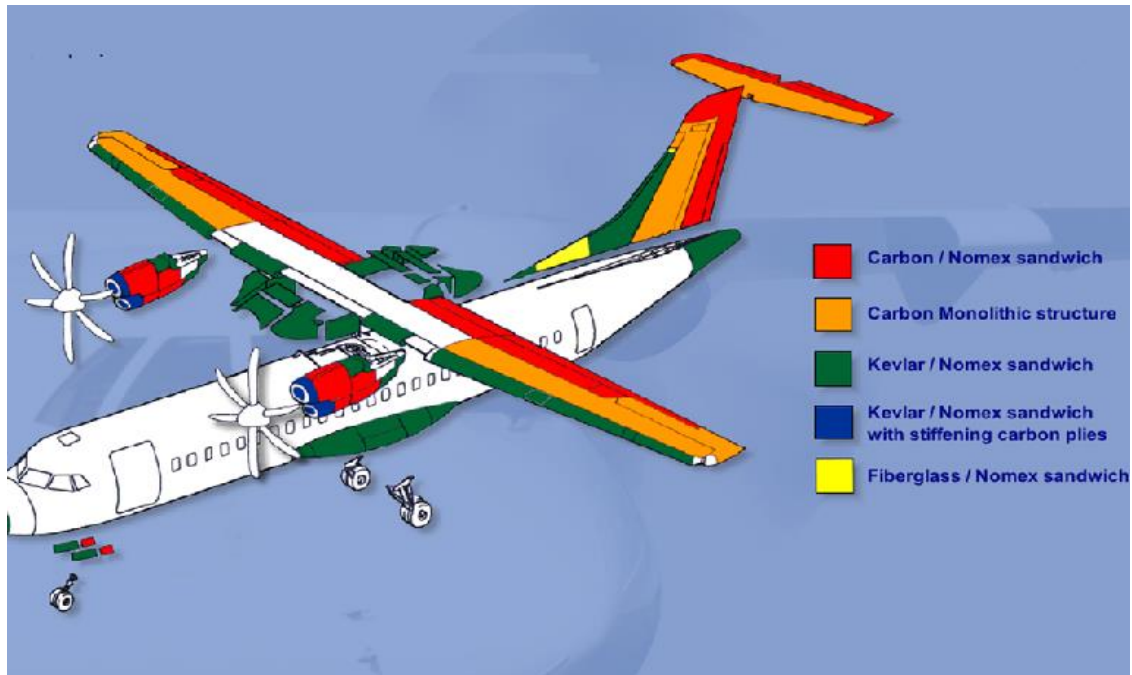


The primary structure includes fuselage which is a Semi-Monocoque structure, includes the primary and secondary structure and primary fuselage is made of 2024 T3 ALCLAD Aluminium alloy. The primary structure has got different sections the nose, forward centre, centre, rear centre and tail section. The fuselage has elliptical cross section. The fuselage main structure consists of components such as Bulkheads, Fuselage frames, Stringers and Skin panels. All the sections are joined by metallic high strength fasteners.



***Main Dimensions of ATR 72-500 aircraft.***

The main wing is divided into two sections, centre box and outer box. The centre box is made of Aluminium Alloy with integral Stringer. The outer wing skin is made of Carbon Monolithic structures with machined aluminium ribs. The trailing edge flaps and engine cowls are made of Carbon Nomex structure.



***Composite Components of ATR 72 aircraft***

ATR aircraft is provided with T-Type stabilizers bolted to fuselage tail section. ATR aircraft horizontal stabilizer is of cantilever type; it is composed of a leading edge and a main box. The horizontal stabilizer is fitted to top end of vertical stabilizer spar by means of 6 bolts. ATR aircraft vertical stabilizer is composed of dorsal fin and fin. The dorsal fin is fixed to the fuselage by means of screws. It is of conventional type structure using composite materials for skin panels. The ribs are made of 7075-T62. The fin is fitted to the rear fuselage by means of 12 bolts. The fin includes a removable leading edge and a main box.

ATR 72-500 aircraft VT-JCV (MSN. 932) had been manufactured on 02nd December 2010. The aircraft was registered with DGCA under the ownership of M/s Injet leasing company limited on 09.12.2010. The aircraft is registered under category 'A' and the Certificate of Registration No. 4154.

The Certificate of Airworthiness Number 6263 under "Normal category" sub-division passenger was issued by DGCA on 03.12.2010. The specified minimum operating crew is two and the maximum all up weight is 22,800 kgs. At the time of incident the Certificate of Airworthiness was current and was valid upto 01.12.2015. The Aircraft was holding a valid Aero Mobile Licence No. A006 at the time of incident. This Aircraft was operated under Scheduled Operator's Permit No. S-6A

which was valid up to 12.02.2013. As on 02<sup>nd</sup> March 2012 the aircraft had logged 3899: 11 Airframe Hours.

The ATR 72-500 Aircraft and its Engines are being maintained as per the maintenance program consisting of calendar period/ flying Hours or Cycles based maintenance as per maintenance program approved by Regional Airworthiness office, Mumbai.

Accordingly, the last major inspection 'A6' check carried out at 2986 Hrs/ 2311 cycles on 22 Nov 2011. Subsequently all lower inspections, after last flight inspection and pre flight checks, were carried out as and when due before the incident.

The aircraft was last weighed on 10<sup>th</sup> Dec 2010 at Toulouse- Saint Martin, France and the weight schedule was prepared and duly approved by the office of Director of Airworthiness, DGCA, Mumbai. As per the approved weight schedule the Empty weight of the aircraft is 13,209 kgs. Maximum fuel capacity is 5000 kgs. Maximum permissible load with 2 pilots, 2 cabin crew, with full fuel and Oil (without passenger) is 4203 Kgs. Empty weight CG is 14.034 meter aft of datum. As there has not been any major modification affecting weight & balance since last weighing, hence the next weighing is due on 04<sup>th</sup> Nov 2015. Prior to the incident flight the weight and balance of the aircraft was well within the operating limits.

All the concerned Airworthiness Directive, Service Bulletins, DGCA Mandatory Modifications on this aircraft and its engine have been complied with as on date of event.

Transit Inspections are carried out as per approved Transit Inspection schedules and all the higher inspection schedules include checks/inspection as per the manufacturer's guidelines as specified in Maintenance Program and are approved by the Quality Manager.

The last fuel microbiological test was done on 17<sup>th</sup> Nov 2011 at Kolkata. DGCA approved facility and the colony count was within acceptable limits.

The ATR 72-500 aircraft is fitted with two wing mounted Turboprop PW127F/M engines manufactured by Pratt & Whitney. The left Engine S/N EB0341 had logged 10648 Engine Hrs and 8467 cycles and the right Engine S/N ED0319 had logged 3900 Hrs with 3026 cycles. There was no defect report on the engine on the previous flight.

### 1.7 Meteorological information:

The following is the Met report on the date of incident between 1400 hrs to 1530 hrs

Time (Hrs)	Wind Dir	Speed (kts)	Visibility	Clouds	Temp (°C)	DP	QNH	Trend
1400	320	10	8 Km	SKC	26.5	1.2	1008	NO SIG
1430	320	13	8 Km	SKC	26.3	1.3	1006	BECMG 32015G25 Kt
1500	300	10G20	8 Km	SKC	26.3	0.9	1007	BECMG 32015G25 Kt
1530	320	10G20	8 Km	SKC	26.1	0.0	1007	NO SIG

### 1.8 Aids to navigation:

Chandigarh airfield is a defense airfield and the operations are controlled by the Indian Air Force. There is single runway available at Chandigarh airfield which has the orientation 11/29. The VOR/DME approaches are available on either side of the runway. However the ILS landing facility is available for runway 11 only. The PAPI is available for the runway 11 / 29 (3 degree Glide Path). There is an Aerodrome Beacon over- ATC Roof (Green 7 White 7 RPM). NDB is also available at Chandigarh Airfield, for approach and landing. Two way VHF communication is available at the airport. The ATC is controlled and manned by Air Force.

**1.9 Communications:** There was always two ways communication between the ATC and the aircraft.

## 1.10 Aerodrome information:

### Co-ordinates

ARP: N 30° 40' 29"  
E 76° 47' 26"

Elevation - 1030' FT. (314 m)

Controlling Authority: Indian Air Force, Western Air Command

### Runway Orientation and dimension

Orientation -11 / 29

Length - 9000'x150' (2743 m x 45 m)

Runway Surface – First 900' on either side concrete, rest bitumen.

PCN 36 R/C/X/T.

Runway	TORA	TODA	ASDA	LDA
11	9000	10275	9975	9000
29	9000	10300	10000	9000

R/W & Taxi Tracks Markings Standard as per Annex- 14

### Visual Aids

PAPI - 11 / 29 (3 degree Glide Path)

Aerodrome Beacon over- ATC Roof (Green 7 White 7 RPM)

### R/W Lighting

HIRL available

### Stand by Power Supply

Diesel Generators

Airspace Controlling Authority Air Force Station Chandigarh.

Minimum Sector Altitude: 9800'  
Transition Altitude TA: 10000'  
Initial approach/ Holding Altitude: 9800'

## Met Services

Indian Air Force Met Section: Maintains 24 H current weather watch and 18 H forecasting watch

## Navigation Aids.

DVOR & DME Co-located. Code-'CHG' Frequency-116.5 MHZ

ILS (Localizer) Code - 'CHD' Frequency- 110.3 MHZ

NDB. Code CG Frequency 228

## VHF R/T Channel

Control Tower - 118.3 MHZ

Approach Control - 118.6 MHZ

Fire Safety Services Category – VII

Fuel: ATF by IOC

Chandigarh airfield is a Defence airfield and the operations are controlled by Indian Air Force. The ATC is controlled by the Indian Air Force and the Civil apron is controlled by Airports Authority of India.

**1.11 Flight recorders:** The Cockpit Voice Recorder (CVR) and the Digital Flight Data Recorder (DFDR) were downloaded and the following information was attained from them.

### **CVR:**

1. While approaching into Chandigarh the Commander of the aircraft requested ATC for runway 29.
2. The weather reported by ATC was fine with visibility 8 Km winds 320/10 Kts.
3. ATC cleared the aircraft for landing on runway 29 with winds 320/10 Kts.
4. Both the commander and the first officer did mention in the cockpit, during descent, that they had not flown into Chandigarh for quite some time.
5. The approach and descent was observed to be normal.
6. The commander did mention to the first officer that PAPI was not available however same was not reported to the ATC.
7. During landing a thud sound is heard and in few seconds the captain calls out for go around.

8. During go around both the pilots discussed about go around altitude and procedure.
9. Second approach was made in coordination with ATC and the aircraft landed safely on runway 29.
10. After landing the commander mentioned that the nose was going up so he pressed the yoke and taxied the aircraft to bay.

**DFDR:**

**Tabulated DFDR parameters for First Approach, Go Around and Final Landing**

FIRST APPROACH & GO AROUND								
REL TIME	RADIO ALT	PITCH	SPEED CAS	PLA1	PLA 2	VERT 'g'	LDG STATUS	
12:42:23	97	-4.39	130	41	41	1.05	FULL_AIR	FULL_AIR
12:42:24	84	-2.64	129	42	41	1.13	FULL_AIR	FULL_AIR
12:42:25	73	-2.46	128	42	42	1.07	FULL_AIR	FULL_AIR
12:42:26	65	-2.81	126	42	42	1.06	FULL_AIR	FULL_AIR
12:42:27	54	-3.16	125	42	42	1	FULL_AIR	FULL_AIR
12:42:28	45	-2.9	127	42	42	1.08	FULL_AIR	FULL_AIR
12:42:29	36	-2.81	124	42	42	1.12	FULL_AIR	FULL_AIR
12:42:30	29	-4.04	124	42	41	0.98	FULL_AIR	FULL_AIR
12:42:31	21	-1.85	128	42	41	1.16	FULL_AIR	FULL_AIR
12:42:32	14	-1.41	122	42	42	1.13	FULL_AIR	FULL_AIR
12:42:33	10	-1.67	122	42	42	1.03	FULL_AIR	FULL_AIR
12:42:34	6	-1.67	120	42	42	1.08	FULL_AIR	FULL_AIR
12:42:35	4	-1.67	126	41	40	1.07	FULL_AIR	FULL_AIR
12:42:36	0	-1.93	118	40	40	1.51	FULL_AIR	FULL_AIR
12:42:37	-1	-0.53	121	41	40	1.4	FULL_AIR	FULL_AIR
12:42:38	2	-2.02	120	40	40	0.87	FULL_AIR	FULL_AIR
12:42:39	-1	0.35	119	40	40	1.68	FULL_AIR	FULL_AIR
12:42:40	2	1.14	114	40	38	1.13	FULL_AIR	FULL_AIR
12:42:41	6	-2.72	116	40	38	0.7	FULL_AIR	FULL_AIR
12:42:42	0	3.16	119	39	38	2.6	FULL_AIR	FULL_AIR
12:42:43	5	9.84	113	60	53	1.51	FULL_GRD	FULL_GRD
12:42:44	23	8.35	109	80	79	1.17	FULL_AIR	FULL_AIR
12:42:45	40	1.41	109	80	79	0.89	FULL_AIR	FULL_AIR

## FINAL LANDING

RELTIME	RADIO ALT	PITCH	SPEED CAS	PLA1	PLA 2	VERT 'g'	LDG STATUS	
12:57:59	30	-2.9	120	46	46	1.04	FULL_AIR	FULL_AIR
12:58:00	22	-2.29	121	46	46	1.08	FULL_AIR	FULL_AIR
12:58:01	16	-2.2	121	46	46	1.09	FULL_AIR	FULL_AIR
12:58:02	11	-1.23	119	46	46	1.13	FULL_AIR	FULL_AIR
12:58:03	7	-0.97	118	46	47	1.12	FULL_AIR	FULL_AIR
12:58:04	4	-1.41	116	46	46	1.06	FULL_AIR	FULL_AIR
12:58:05	2	-1.32	121	46	46	1.04	FULL_AIR	FULL_AIR
12:58:06	0	-1.93	122	42	42	1.13	FULL_AIR	FULL_AIR
12:58:07	-1	-0.62	120	43	45	1.38	FULL_AIR	FULL_AIR
12:58:08	0	-2.64	122	43	43	0.96	FULL_AIR	FULL_AIR
12:58:09	-1	-0.79	121	37	33	1.5	FULL_AIR	FULL_AIR
12:58:10	-1	-2.64	116	34	29	0.96	FULL_AIR	FULL_AIR
12:58:11	-1	-0.53	122	26	20	1.38	FULL_AIR	FULL_AIR
12:58:12	-1	-1.67	108	26	19	1.22	FULL_AIR	FULL_AIR
12:58:13	-1	-1.41	107	19	13	1.13	FULL_AIR	FULL_AIR
12:58:14	-2	-1.58	100	15	12	1.1	FULL_AIR	FULL_AIR
12:58:15	-1	-1.14	92	14	12	1.08	FULL_GRD	FULL_GRD
12:58:16	-1	-1.32	85	14	11	1.05	FULL_GRD	FULL_GRD

a) As per DFDR analysis it was observed that from 1000 ft radio altitude to the flare altitude the pilot maintained very high speed varying between 128 knots to 122 kts which was 20 kts above the Vapp.

1. **Aircraft touched down a first time** with a pitch attitude of -1.9°: according to aircraft geometry and with accuracy of the recording we can consider that an almost 3-points- landing. During this touch:

- PLAs were not retarded to idle power.
- The peak of vertical load factor was 1.52 g
- Vertical speed did not exceed any limit

2. **Aircraft touched down a second time** with a pitch attitude of 0.35°: according to aircraft geometry we can consider that a nose gear touchdown rapidly followed by main gear touch. During this touch:

- PLAs were well higher than idle.
- The peak of vertical load factor was 1.68 g;
- Vertical speed did not exceed any limits.



3. **Aircraft touched down a third time:** with a pitch attitude of 3.16°: according to aircraft geometry we can consider that a nose gear touchdown rapidly followed by right and then left main gear touch. During this touch:
  - PLAs were well higher than idle.
  - The peak of vertical load factor was 2.6 g;
  - CG Vertical speed for NLG touch  $\approx$  3.0 m/s that is over ultimate loads;
  - CG Vertical speed for MLG touch  $\approx$  3.47 m/s considering the Landing Weight it is very close to the limit energy of the landing gears.
  - Thereafter the aircraft performed a go-around.
  
4. After carrying out the go around and while on second approach for landing the DFDR analysis revealed that the pilot maintained a speed of about 122 kts which again was well above the Vapp with pitch of -1.93 at the time of touch down with power levers at 43°, which again resulted into a bounce and finally the aircraft settled down on the runway.

DFDR analysis revealed that during landing the pilot did not flare and retard power to idle as per Standard Operating Procedures. At the time of touchdown the power levers angle were at 42°, which was well above the idle power. The pilot maintained the same speed and the pitch almost till flare height of around 30 ft. Since the speed was very high by the time the pilot initiated flare the aircraft nose landing gear made a touchdown on the runway surface with a pitch of -1.93° and vertical 'g' of 1.51. It bounced and landed after 01 second with a vertical g of 1.68 and thereafter bounced again after 03 seconds with vertical 'g' of 2.68. Thereafter the pilot initiated a go around.

### **1.12 Wreckage and impact information.**

The nose landing gear of the aircraft and the right gear impacted the runway during initial touchdown thereafter the aircraft bounced twice with a maximum vertical g of 2.6 before initiating go around. During inspection it was observed that the right nose wheel flange was damaged. About 90% of inboard side of solid

metallic portion of right nose wheel hub was found missing. Right wheel axle sleeve was also found damaged due impact with the runway. The DFDR raw data was forwarded to manufacturer (ATR) for detailed analysis. As per the analysis

a. Nose Landing Gear (NLG)

- Because nose L/G impacted the ground first and alone, the calculated Reduced Mass to the NLG has been 17420 Kg.
- Vertical speed (Vz) to NLG has been 3.46 m/s.

*As a consequence, the Energy withdrawn by the NLG leg assembly at landing was above the specification value of NLG. As per the ATR recommendation NLG to be discarded.*

b. RH Main Landing Gear (RH MLG)

- Because RH MLG L/G impacted the ground alone just after the Nose, the calculated Reduced Mass to the RH MLG has been 17420 Kg.
- Vertical speed (Vz) to RH MLG has been 3.47 m/s.

*As a consequence, the Energy withdrawn by the RH MLG leg assembly at landing was above the specification value of RH MLG. As per the ATR recommendation RH MLG to be discarded.*

c. LH Main Landing Gear

- Because LH MLG L/G impacted after the RH MLG L/G, the calculated Reduced Mass to the LH MLG has been 8710 Kg (NLG and RH MLG have previously received the main rate of the total landing energy).
- Vertical Speed (Vz) to LH MLG has been 2 m/s.

*As a consequence, the energy withdrawn by the LH MLG leg assembly at landing was within the specification value of LH MLG. Hence the LH MLG can be utilized provided a detailed inspection is carried out at approved facility.*

### **1.13 Medical and pathological Information:**

Both the Commanders had undergone preflight medical check prior to the flight at Jaipur which was found satisfactory.

#### **1.14 Fire:**

There was no fire after the incident.

#### **1.15 Survival aspects:**

The incident was survivable.

#### **1.16 Tests and research: NIL**

#### **1.17 Organizational and management information:**

M/s Jet Airways currently operates a fleet of 102 aircraft, which includes 10 Boeing 777-300 ER aircraft, 12 Airbus A330-200 aircraft, 60 next generation Boeing 737-700/800/900 aircraft and 20 modern ATR 72-500 turboprop aircraft, with an average fleet age of 6.04 years. M/s Jet Airways operates 76 destinations (54 Domestic + 22 international). Jet Airways has approx 12000 employees in complete organization.

#### **1.18 Additional information:**

**1.18.1** After the incident the aircraft was grounded for detailed inspection and rectification in consultation with the manufacturer, ATR. The work/inspection package was formulated by the manufacturer as per the DFDR analysis. The inspection/work package as desired by the ATR was carried out at Chandigarh. The details of the work package are tabulated below. As per ATR recommendation the nose landing gear was replaced at Chandigarh.

Thereafter a NTO was issued by ATR to ferry the aircraft from Chandigarh to Bangalore with gear down.

ATA CHAPTER NO.	INSPECTIONS	TASK REFERENCE	FINDINGS
	<b>GENERAL</b>		
1	AIRCRAFT INSPECTION WHEEL ON GROUND	A/C GENERAL VISUAL INSPECTION AS PER NDTM 51-90-00 , INCLUDING :- WING TO FUSELAGE, DORSAL FIN, HOR TO VERT STABILIZERS, MLG,...FAIRINGS FOR RESEARCH OF DISPLACEMENTS/ABNORMAL GAP, FUSELAGE + STABILIZERS FOR IMPACTS RESEARCH, GAPS BTW FLAP/AILERON, ELEVATOR, AND SURROUNDING STRUCTURES COMPARED TO OPPOSITE SIDE FOR RESEARCH OF ABNORMAL GAPS, IDEM BTW RUDDER AND TAIL CONE/STABILIZER CLOSING RIB, ...ETC.	Inspection carried out and found satisfactory.
2	If feasible A/C JACKING (making sure that jacking points areas are in good conditions) If required: INSPECTION AFTER HARD LANDING and INSPECTION AFTER LEAVING RUNWAY	JIC 07-11-00 JUP10000 JIC 05-51-10 DVI10000 JIC 05-51-18 DVI 10000 JIC 05-51-15 DVI 10000	1) Inspection carried out and found satisfactory, except finding as reported earlier on the nose wheel hub. 2) MLG target gap insp. Couldn't be carried out due jacking constraints. However visual inspection of the sensor, target and harness found satisfactory.
	<b>WINGS</b>		
18	WING LWR AND UPPER PANELS INSPECTION (RESEARCH OF FUEL LEAK, SHEARED RIVETS OR SEALANTS, DISTORTIONS,BETWEEN RIBS 12 ANB 14	NDTM 51-90-00 57-24-00 DVI 10000 limited to external inspections without tank opening 57-24-10 DVI 10000 (ATR72) 57-24-20 DVI 10000 (ATR72)	DVI carried out and found satisfactory.
	<b>FUSELAGE</b>		
25	WING TO FUSELAGE FAIRINGS REMOVAL	JIC 53-93-00 RAI10000	Fairing removed condition satisfactory.
26	WING TO FUSELAGE FAIRINGS SUBSTRUCTURE INSPECTION	NDTM 51-90-00	Inspection carried out and found satisfactory.
29	a) DVI INSPECTION OF THE NLG ATTACHMENTS AND FLATNESS CHECK OF NLG BAY LATERAL-UPPER BULKHEADS / BULKHEAD-FRAMES...ETC. FOR RESEARCH OF SHEARED RIVETS OR SEALANTS, DISTORTIONS, ETC. Internal DVI of frame 6 web (LH and RH sides) paying particular attention to lower part of web and at NLG attach fittings. b) PERFORM NORMAL LDG RETRACTION/EXTENSION AND STEERING SYSTEM TESTS BY MEANS OF GREASE PLATES UNDER NOSE WHEELS per JIC 32-51-00-OPT-10010 and JIC 32-51-00-FUT-10000. CONFIRM CONDITION OF NLG/MLG SHOCK ABSORBERS	NDTM 51-90-00 JIC 53-11-00 DVI10005, JIC 53-11-00 DVI10010, JIC 53-11-00 DVI10030, JIC 53-17-00 DVI10010, JIC 05-51-15 DVI10000 JIC 32-31-00 FUT10000 (if required) JIC 32-51-00-OPT-10010 JIC 32-51-00 FUT10000 (if required, steering system to be checked wheel on ground at the end) JIC 32-11-00 CHK 10000 (MLG Sliding Rod Extension check, aircraft on wheels) JIC 32-21-00 CHK 10000 (NLG Sliding Rod Extension check, aircraft on wheels)	a) DVI carried out and found satisfactory. b) NLG Replacement and post installation checks carried out found satisfactory. c) MLG shock absorber condition found satisfactory.

	<p><b>INSPECTION OF INTERNAL STRUCTURES OF THE NLG BAY:</b></p> <p>- from the cockpit : removing metallic floor panel on RH side and just getting loose opposite panel on LH side in which the steering is going through, (for this it also better to remove all cockpit seats as well as the door). and from the NLG bay opening small access doors on laterals webs and the one on top horizontal web (the lateral "floor" panels within the avionic compartment must be also removed,...). All the lwr frames sections from frames 2 to 6 and in-between intercostals must be inspected, for this make sure that where required the insulations blankets are separated to allow a correct inspection, refer to attached document for the kind of damage we are looking for.</p>	<ul style="list-style-type: none"> <li>- RAI of Captain and F/O seats AMM JIC 25-11-11 RAI 10000</li> <li>- RAI of windshield Temp Controller AMM JIC 30-42-11 RAI 10000 + IPC 53-17-10 figure 18</li> <li>- RAI of Temperature Control Bracket IPC 30-42-10 figure 1</li> <li>- RAI of Access Door FIN 115AZ IPC 52-42-10 figure 1</li> <li>- RAI of floor panels IPC 53-12-10 figure 1 (cf doc+photo ci jointe)</li> <li>- RAI of insulation Blanket IPC 25-12-10 figure 58B</li> <li>- RAI of CONTROL UNIT FIN 2MQ IPC 52-51-10 figure 01A + JIC 52-51-00 RAI 10000</li> <li>- RAI of support radar IPC 53-17-10 figure 16</li> <li>- ...etc. .</li> </ul>	<p>DVI carried out and found satisfactory, other than one missing rivet installed as reported earlier.</p>
31	<p>DETAILED VISUAL INSPECTION OF MLG BAY AND SUBSTRUCTURES (FLATNESS CHECKS), MLG, MLG TRUNNION SUPPORTS, WHEEL/TIRES/BRAKES, ...ETC. DVI INSPECTION OF ELECTRICAL WIRINGS AND HYDRAULIC PIPES/CONNECTIONS FOR RESEARCH OF DEFORMATION, LEAK, CUT, ... PERFORM NORMAL LG RETRACT./EXTENSION TESTS</p>	<p>NDTM 51-90-00 JIC 05-51-15 DVI10000 JIC 32-31-00 FUT10000 (if required) JIC 32-41-00 CHK 10010 (tires) JIC 53-57-00 DVI10000 (MLG fittings)</p>	<p>DVI carried out and found satisfactory. Normal LG retract./extension couldn't be carried out due infrastructure constraints NTO obtained for the same</p>
32	<p>PAX SEATS , OVERHEAD STOWAGE COMPARTMENTS, CEILING/LINING PANELS, FLOOR PANELS REMOVAL BETWEEN FRAMES 23/29 ON BOTH LH/RH SIDES</p>	<p>JIC 25-21-21 RAI10000 JIC 25-23-21 RAI10000 JIC 25-23-23 RAI10000 JIC 25-24-21 RAI10000 ...ETC.</p>	<p>Condition checked and found satisfactory.</p>
33	<p>DVI AND FLATNESS CHECK OF MACHINED FRAMES 25 AND 27 AND FRAME 26, PLUS DVI OF LOWER PRESSURE PLATE BTW FR. 25/27 , KEEL BEAM, ETC. .</p>	<p>JIC 53-51-00 DVI10008 (int lwr longerons) JIC 53-51-00 DVI10013 (ext skin btw str14/15 and fr. 23/29) JIC 53-51-00 DVI10018 (ATR72 - int lwr longerons) JIC 53-51-00 DVI10023 (upper par of Fr. 26) JIC 53-51-00 DVI10030 (typical Fr. 23 to 29) JIC 53-51-00 DVI10050 (center section Fr 25 to 27) JIC 53-51-00 DVI10055 (front and rear lwr spars At Fr. 25 and 27) JIC 53-51-00 DVI10060 (ATR42 int. lwr longerons) JIC 53-51-00 DVI10070 (ATR42 ext. Fwd korner of wheel well) JIC 53-51-00 DVI10040 (Fr. 26 shear tie btw str. 12/13 , ATR42) JIC 53-51-00 DVI10001 (ATR72 - int. lower pressure plate btw frames 25/27) JIC 53-51-00 DVI10065 (ext. lower pressure plate btw frames 25/27) JIC 53-51-00 DVI10075 (ext lwr longerons btw frazes 25/27). JIC 53-51-00 DVI10080 (int frame 26 lwr splices). JIC 53-51-00 DVI10098 (ATR72 - int. Frame 26 floor beam splice At BLO). JIC 53-51-25 DVI10000 (ext. keel beam)</p>	<p>DVI carried out and found satisfactory.</p>
34	<p>FRAME TO FRAME DISTANCE CHECK BTW FR. 24 AND 28 FROM STR. 14 TO THE TOP, PLUS FRAME 25/27 HEADS TO FLOOR BEAM DISTANCE CHECK,</p>	<p>NDTM 51-90-00 ANALYSIS OF RESULTS PERFORMING</p>	<p>1. Frame to Frame Distance between FR.24 and 28 from STR 14 found 2225 mm at LEFT side and 2225 at RIGHT</p>

	PLUS FRAMES 25/27 DISTANCES CHECK FROM STR. 14 TO THE TOP	SYMETRICAL COMPARISONS	side. 2. Frame 25/27 Heads to Floor beam distance found 78.06 inch. 3. Frame 25/27 distance from STR.14 to Top found 93.00 inch
35	DVI OF FWD AND REAR WING PRESSURE DECKS, PLUS DVI OF THE FUSELAGE/WING PRESSURE SEAL, PLUS CEILING PANEL TO WING PANEL GAP CHECK.	NDTM 51-90-00 JIC 53-51-00 DVI10015 (ext fwd deck) JIC 53-51-00 DVI10025 (ext rear deck) JIC 53-51-00 DVI10035 (int fwd deck) JIC 53-51-00 DVI10045 (int rear deck) JIC 53-51-00 DVI10085 (int. up longerons splices). JIC 53-51-00 DVI10090 (ext up longerons splices). JIC 53-51-00 DVI10095 (ext circumf. splices at fr. 23/29).	DVI carried out and found satisfactory.
36	DVI OF WING ATTACHMENT FITTINGS AT WING RIB 2 (ONLY DETAILED VISUAL INSPECTION WITHOUT ANY ATTACHMENT PIN REMOVAL)	JIC 57-15-10 DVI10020 (fwd wing fittings) JIC 57-15-10 DVI10010 (rear wing fittings) JIC 53-51-00 DVI10000 (fr. 25/27 heads) JIC 53-51-00 DVI10020 (fr. 25/27 heads lugs)	DVI carried out and found satisfactory.
37	DVI OF WING ATTACHMENT FITTINGS AT WING RIB 4 (ONLY DETAILED VISUAL INSPECTION WITHOUT ANY ATTACHMENT PIN REMOVAL)	JIC 57-15-22 DVI10000 (fwd wing fittings) JIC 57-15-21 DVI10000 (aft wing fittings) JIC 53-51-00 DVI10000 JIC 53-51-00 DVI10005 (str. 7 area btw fr. 25/27) JIC 53-51-00 DVI10010 (frames 25/27 str. 7 fuselage fittings)	DVI carried out and found satisfactory.
38	DVI OF SHEAR WEBS AND ADJACENT STRUCTURES	JIC 57-15-10 DVI10000 JIC 53-51-00 DVI10003 NDTM 51-90-00 (use a bores cope to inspect back side of shear webs).	DVI carried out and found satisfactory.
39	POSSIBLE ADDITIONAL INSPECTIONS DEPENDING ON PREVIOUS INSPECTIONS RESULTS FINDINGS.	TO BE DEFINED (POSSIBLE AIRCRAFT MEASUREMENTS,...ETC.)	Nil Findings.

After the aircraft landed safely at Bangalore it was again grounded for inspections of main landing gears. As per ATR recommendations the Right main landing gear was discarded since it had exceeded its specification value. During the replacement of right main landing gear the RH main landing gear damper was also found damaged due impact, same was also replaced along with right main landing gear.

As per ATR recommendation the LH MLG was also removed for detailed visual inspection and was found to be satisfactory, and was installed back on aircraft.

**1.18.2 Commander Experience:** The Commander is an ATPL holder from CAA, Nepal who was flying under the privileges of FATA (Foreign Aircrew Temporary Authorization) issued by DGCA. His first appointment was with M/s Air Deccan Airlines in August 2004. His initial FATA was issued in June 2005 and he served the airline till August 2006. In September 2006 the commander joined M/s Kingfisher Airlines and served till September 2009. Thereafter he joined Wing Air, Indonesia and was in service with them till January 2011. In February 2011 the commander joined M/s Jet Airways and was in service with the airlines till March 2012. Though his current FATA was valid till April 2012, the commander has not flown in India since 09.03.2012.

Prior to the incident the commander had flown in India under the privileges of FATA for around 06 years. He was not involved in any accident/serious incident prior to this case.

**1.18.3 Cabin Crew In-Charge:** As per CAR Section 7 Series M Part 1 Issue II Para 3.3 there is a requirement that all flight shall be operated by qualified cabin crew in-charge. The Jet Airways Cabin Crew Department had also issued a circular on this Reference JACC/SEP/20/12 dated 22.02.2012, however there was no qualified CCIC (Cabin Crew In-Charge) on board the incident flight.

**1.19 Useful or effective investigation techniques:** NIL

## **2. ANALYSIS**

### **2.1 Serviceability of the aircraft:**

ATR 72-500 aircraft VT-JCV (MSN. 932) was manufactured on 02<sup>nd</sup> December 2010. The aircraft was registered with DGCA under the ownership of M/s Injet leasing company limited on 09.12.2010. The aircraft is registered under category 'A' and the Certificate of Registration No. 4154.

The Certificate of Airworthiness was issued by DGCA on 03.12.2010 and was current and valid upto 01.12.2015. This Aircraft was operated under Scheduled Operator's Permit No. S-6A which was valid up to 12.02.2013.

The ATR 72-500 Aircraft and its Engines were being maintained as per the maintenance program consisting of calendar period/ flying Hours or Cycles based maintenance as per maintenance program approved by Regional Airworthiness office, Mumbai.

Accordingly, the last major inspection 'A6' check was carried out at 2986 Hrs/ 2311 cycles on 22 Nov 2011. Subsequently all lower inspections, after last flight inspection and pre flight checks were carried out as and when due before the incident. There was no major modification affecting weight & balance since last weighing, hence the next weighing is due on 04<sup>th</sup> Nov 2015.

All the concerned Airworthiness Directive, Service Bulletins, DGCA Mandatory Modifications on this aircraft and its engine were found complied with. All Transit Inspections were carried out as per approved Transit Inspection schedules and all the higher inspection schedules include checks/inspection as per the manufacturer's guidelines as specified in Maintenance Program and are approved by the Quality Manager. The last fuel microbiological test was done on 17<sup>th</sup> Nov 2011 at Kolkata. DGCA approved facility and the colony count was within acceptable limits.

**2.1.1** Investigation revealed that the aircraft was confined around its final rest position and there was no in-flight disintegration of any part of the aircraft. Other than the nose landing gear hub damage there was no other visible damage on the aircraft. After DFDR analysis it was known that the nose landing gear and right main landing gear had exceeded the specification values during the hard landing and were scrapped as per ATR recommendations. Other than this there was no damage/defect found on the aircraft during detail investigation. Further prior to the incident flight the aircraft had operated three sector flights (Kolkata-Raipur-Indore-Jaipur) and no snag was reported on the aircraft.

In view of the above, it is inferred that the serviceability of the aircraft is not a factor to the incident.



## **2.2 Weather:**

The weather at departure from Jaipur was fine with visibility more than 5 km with clear skies. The enroute weather was fine. The weather at destination Chandigarh was reported as visibility 8 Km clear skies winds 320/12 kts. There was no weather warning issued from Chandigarh.

From the above it is inferred that weather is not a contributory factor to the incident.

## **2.3 Pilot handling of the aircraft:**

On 02/03/2012 M/s Jet Airways Ltd. ATR 72-500, VT-JCV, aircraft was scheduled to operate early morning flight for sector Kolkata – Raipur – Indore – Jaipur. On these sectors there was no snag reported on the aircraft by the operating crew. Thereafter VT-JCV was scheduled to operate flight 9W-2821 (Jaipur – Chandigarh) with crew change. Prior to the incident flight the commander had last flown to Chandigarh on 12.01.2012.

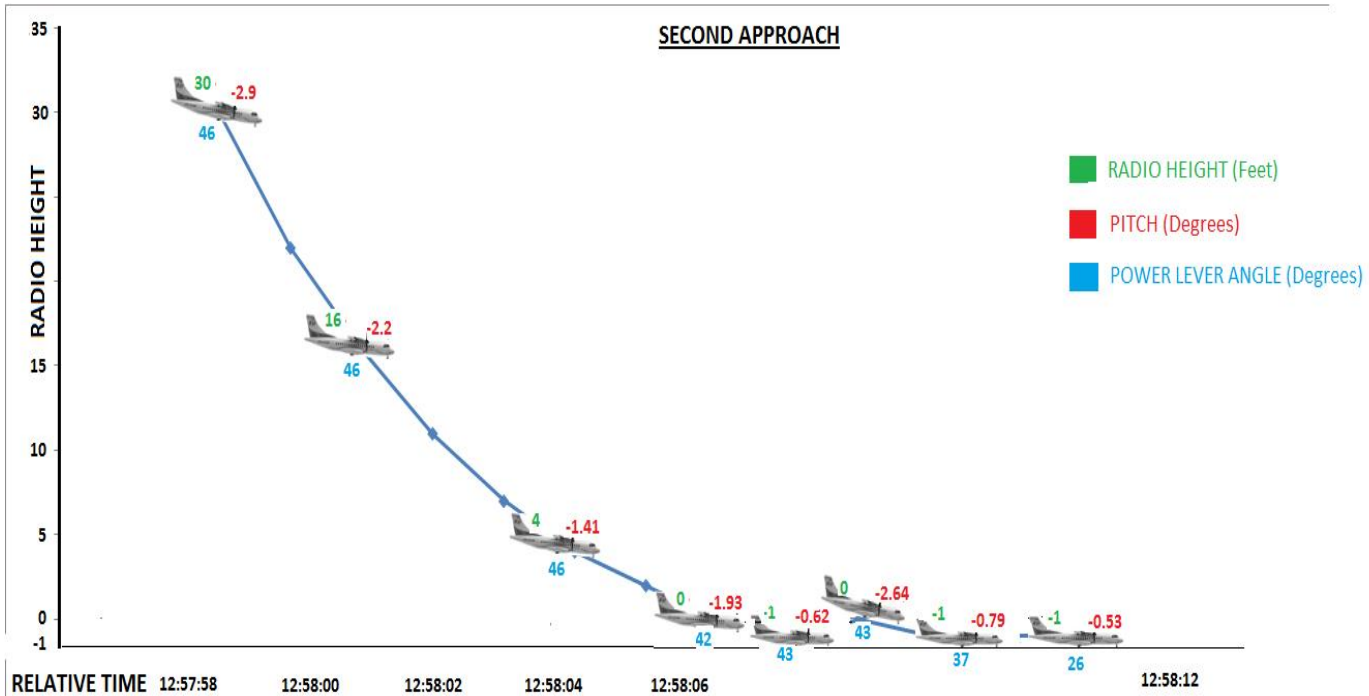
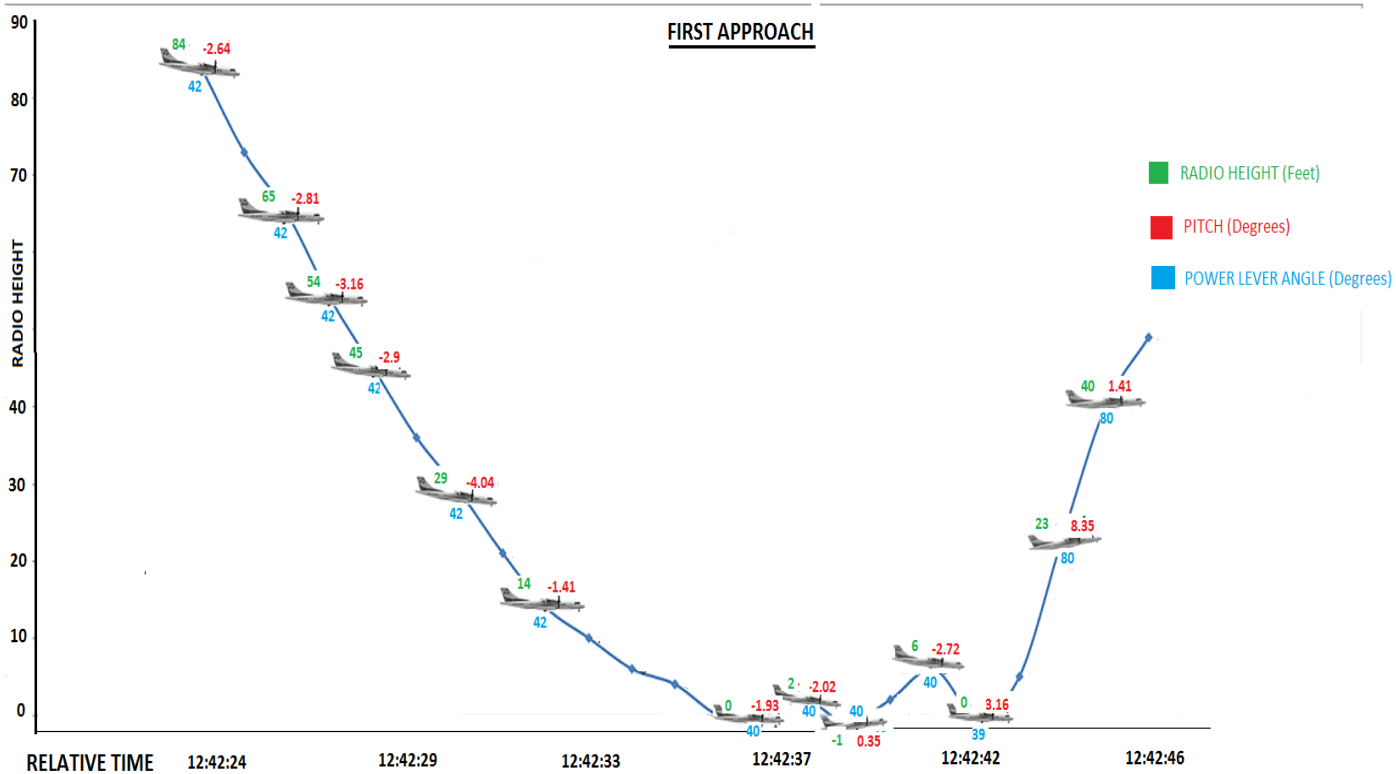
The weather at Jaipur was fine, visibility more than 5 kilometers with clear skies. The aircraft got airborne from Jaipur at around 0740 UTC for Chandigarh. While inbound to Chandigarh, VT-JCV first contacted ATC at around 0830 UTC and reported ETA as 0910 UTC. The Chandigarh ATC gave the complete METAR as clear skies, visibility 8000 meters, winds variable 320/10 knots. Thereafter the Commander requested ATC for runway 29 as this is straight in approach while operating this sector. Thereafter the ATC cleared VT-JCV for VOR-DME approach R/W 29, the platform altitude of 3000 feet was maintained uptill 6 DME by the operating crew. Subsequently the VOR-DME procedure for Chandigarh was executed as per Standard Operating Procedure at minimums the aircraft was on profile.

As per the Bug card the approach speed (Vapp) was 99 kts however considering 14 kts head wind the Vapp was calculated by the pilot to be around 103 kts. DFDR analysis revealed that during approach and landing the commander

maintained very high speed varying between 128 knots to 122 knots, which was around 20 kts plus above the Vapp speed till touchdown. Since the speed was high with powers levers not retarded, by the time the pilot initiated flare the aircraft nose landing gear and the right main landing gear made a touchdown on the runway surface with a pitch of  $-1.93^{\circ}$  and vertical 'g' of 1.51. After the first impact the aircraft bounced and landed after 01 seconds with a vertical g of 1.68 and thereafter bounced again and landed after 03 seconds with vertical 'g' of 2.68. Thereafter the pilot initiated a go around as per the bounce recovery procedure of ATR aircrafts.

During the second approach and landing at flare height the pilot again maintained speeds much above Vapp with pitch of  $-2.90^{\circ}$  and power levers at  $46^{\circ}$ . Just prior to touchdown the pitch was  $-1.93^{\circ}$  with power levers at  $43^{\circ}$ . Since there was no flare this again resulted into a bounce landing and finally the aircraft settled down on the runway. Thereafter the aircraft taxied to the bay and the passengers were disembarked normally. There was no injury to any of the occupants.

From the above it is inferred that the commander carried landing at high speed well above the Vapp speed, pitch attitude was low and pitch trim setting was nose down which resulted into couple of bounces during landing and subsequently into a go around. Hence handling of the aircraft by Commander is a contributory factor to the incident.



## **2.4 Circumstances leading to the Incident :**

M/s Jet Airways ATR 72-500 aircraft, VT-JCV was operating a flight 9W-2821, Jaipur - Chandigarh on 02/03/2012 at around 0730 UTC. The weather at Jaipur was fine, visibility more than 5 kilometers with clear skies. The aircraft took off for Chandigarh at around 07:40 UTC.

Though the calculated Vapp speeds as per the bug card was 103 kts, the pilot maintained speeds much above Vapp as it is evident from DFDR. From 1000ft radio altitude onwards to touch down the speed kept varying between 128 knots to 122 knots which was 20 kts plus above the Vapp with negative pitch attitude till landing. Further the power levers were not retarded during flare height and were kept at 43<sup>0</sup> which was much above the idle power. Since the pilot maintained high speed with negative pitch and power levers not retarded, before he could initiate flare the aircraft nose landing gear and the right main landing gear made a touchdown on the runway surface and subsequently resulted into a bounce landing. Thereafter the pilot initiated a go around as per the bounce recovery procedure. During the second approach and landing the pilot again maintained high speeds during flare with negative pitch attitude which again resulted into a bounce landing and thereafter aircraft settled down on the runway.

## **3 CONCLUSIONS:**

### **3.1 Findings:**

- b) The Certificate of Airworthiness and the Certificate of Registration of the aircraft was valid on the date of incident.
- c) The certificate of flight release was valid on the day of incident.
- d) Both the pilots were appropriately qualified to operate the flight.
- e) All the concerned Airworthiness Directive, Service Bulletins, DGCA Mandatory Modifications on this aircraft and its engine were found complied with.
- f) Previous to the incident flight, the aircraft VT-JCV had operated three sectors (Kolkata – Raipur – Indore - Jaipur) and there was no snag reported on the aircraft.

- g) The weather at Jaipur was fine, visibility more than 5 kilometers with clear skies. The aircraft got airborne from Jaipur at around 0740 UTC for Chandigarh.
- h) The weather at Chandigarh was fine with clear skies, visibility 8000 meters, winds variable 320/10 knots.
- i) The Commander requested ATC for VOR/DME approach runway 29 as this was straight in approach while operating the sector (Jaipur - Chandigarh).
- j) As per the bug card Vapp was 103 kts, however as per DFDR analysis it was observed that from 1000 ft radio altitude to the flare altitude the pilot maintained very high speed varying between 128 knots to 122 kts which was 20 kts above the Vapp.
- k) During flare the Power levers were not retarded to idle, pitch attitude was low and pitch trim setting was nose down which resulted into couple of bounces during landing and subsequently pilot did a go around.
- l) During the second approach and landing the pilot again maintained high speed with power levers not retarded, negative pitch attitude and no flare this again resulted into a bounced landing and finally the aircraft settled down on the runway.
- m) CVR readout revealed that prior to the incident flight both the cockpit crew had not flown into Chandigarh for a long time. The commander had last flown to Chandigarh on 12.01.2012 and the co-pilot had last flown to Chandigarh on 11.11.2011.
- n) There was no injury to any of the occupants on board the aircraft.
- o) After parking and during ground inspection the nose landing gear hub was found damaged. The aircraft was grounded for detailed inspection.
- p) During analysis by ATR it was known that the nose landing gear and the right main landing gear has exceeded their specification values and to be scrapped. The left main landing gear was however subjected to detailed inspection and was found satisfactory and hence re-installed on the aircraft.
- q) While pairing the cockpit crew for operating the flight (Jaipur - Chandigarh) Jet Airways operations department did not consider the fact that both the cockpit crew had not operated into Chandigarh for a considerable time period.

- r) There was no qualified CCIC (Cabin Crew In-Charge) on board the incident flight which is in violation of CAR Section 7 Series M Part 1 Issue II Para 3.3.
- s) Weather was not a contributory factor to the incident.

### **3.2 Probable cause of the Incident:**

During final approach and landing the commander maintained aircraft speeds much higher than Vapp with pitch attitude low and pitch trim setting nose down which resulted into a couple of bounces during landing and subsequently pilot did a go around.

The commander maintaining power levers much above idle power during flare is the contributory factor to the incident.

### **4 SAFETY RECOMMENDATIONS:**

1. All incident/accident to be discussed/reviewed during refreshers/CRM course.
2. During PPC/ training and refresher shall include landing techniques/Bounce recovery and go around procedures.
3. M/s Jet Airways should ensure compliance of CAR Section -7, Series-M, Part-I requirements regarding carriage of cabin crew in-charge for conduct of flight.
4. Hqrs may take appropriate action against the operating crew as deemed fit.

Place: New Delhi  
Date: 20.09.2012



(A. X. Joseph)  
Senior Air Safety Officer (E)  
Inquiry officer to VT-JCV