



**INVESTIGATION REPORT ON HARD LANDING INCIDENT TO M/s INDIGO,
AIRBUS A320 AIRCRAFT, VT-ITK FLIGHT 6E-923 ON 15TH SEP, 2021 AT
KOLKATA**

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**INVESTIGATION REPORT ON HARD LANDING INCIDENT TO M/s
INDIGO, AIRBUS A320 AIRCRAFT, VT-ITK FLIGHT 6E-923 ON 15TH
SEP, 2021 AT KOLKATA**

GENERAL INFORMATION:

a) Aircraft	Type	: Airbus A320
	Model	: Airbus A320-271N
	Nationality	: Indian
	Registration	: VT-ITK
b) Owner		: M/s Subria Three Limited, Ireland
c) Operator		: M/s InterGlobe Aviation Ltd.
d) Pilot in command		: ATPL holder
	Nationality	: Indian
	Extent of Injury	: Nil
e) First Officer		: CPL holder
	Nationality	: Indian
	Extent of Injury	: Nil
f) No. of Cabin Crew		: 04
	Extent of Injury	: Nil
g) No. of Passengers		: 167
	Extent of Injury	: Nil
h) Date and time of Incident		: 15 th Sep, 2021, 15:59:33 UTC
i) Last Point of Departure		: Chennai
j) Point of Intended Landing		: Kolkata
k) Place of Incident		: Kolkata
l) Phase of operation		: Landing
m) Type of Incident		: Abnormal Runway contact of the aircraft (Hard Landing)

(All timings in the report are in UTC, unless otherwise specified)

SYNOPSIS:

On 15th Sep, 2021 M/s Indigo A320 aircraft VT-ITK was scheduled to operate a passenger flight 6E-923 sector Chennai to Kolkata. The aircraft was under the command of an ATPL Holder with a CPL holder as a First officer. There were 173 person on board the aircraft including 6 crew member. The FO was the pilot flying and the PIC was the pilot monitoring.

The aircraft took off from Chennai at approx. 13:55 UTC. The takeoff, climb, cruise and approach were uneventful. However during landing at runway 19L at Netaji Subhas Chandra Bose international airport (VECC) the aircraft made a hard landing. The max vertical acceleration reached upto 3.066g. Hard landing inspections as per AMM was carried out & no damage was observed to the aircraft. There was no injury to the person on board the aircraft.

DGCA instituted the investigation of the incident by appointing an Investigator-in-charge under Rule 13(1) of the Aircraft (Investigation of Accidents and Incidents) Rules, 2017.

The investigation concluded that the Incident occurred due to delayed and inadequate flare input by the first officer during landing.

1.0FACTUAL INFORMATION

1.1 HISTORY OF THE FLIGHT:

On 15th Sep, 2021 M/s Indigo A320 aircraft VT-ITK was scheduled to operate a passenger flight 6E-923 sector Chennai to Kolkata. The aircraft was under the command of an ATPL Holder with a CPL holder as a First officer. There were 173 person on board the aircraft including 6 crew member. The FO was the pilot flying and the PIC was the pilot monitoring.

The aircraft took off from Chennai at 13:55:17 UTC. The takeoff, climb, cruise and approach were uneventful. The aircraft started descend at 15:31UTC. It made an ILS approach for Rwy 19L. Aircraft was established on ILS (LOC & GS) by 1000ft. There was no significant deviation observed from the DFDR data after the aircraft was established on ILS (LOC & GS). The aircraft started descend from 1000 feet radio altitude and was configured for a flaps 20 landing while on approach to Runway 19L.

The autopilot was engaged in glideslope (G/S) & localizer (LOC) modes and the autothrust was engaged in speed (SPD) mode. The autopilot was disengaged at 15:58:18 UTC at 950 ft RA by the PF while the autothrust (A/THR) remained engaged. The descent rate was maintained at an average of 700 feet/minute during the approach.

At approx 95 ft RA, nose down input was given by the PF, the pitch angle decreased from 4.5 degree to 3 degree and rate of descent increased from 600 ft/min to 850ft/min. PIC advised PF to flare. PF initiated the flare at around 15 ft RA and Pitch angle increased from +3° to +4° before decreasing to +3.5°. Just before touchdown, thrust levers were retarded to the IDLE detent leading to A/THR disconnection and the aircraft made hard landing on runway 19L.

There was no intervention from the PIC as he felt that taking over control during a low flare at a high rate of descent had an increased likelihood of a bounced landing and tail strike with severe consequences. Touchdown occurred at 15:59:33 (UTC) and vertical load as per DFDR at time of landing was 3.066 g.

There was no injury to any person on board the aircraft. There was no fire at any stage. Also there was no damage to the aircraft.

1.2 INJURIES TO PERSONS:

Injuries	Crew	Passengers	Others
Fatal	00	00	00
Serious	00	00	00
Minor/None	02+04	167	

1.3 DAMAGES TO THE AIRCRAFT: There was no damage to the aircraft.

1.4 OTHER DAMAGE: NIL

1.5 PERSONNEL INFORMATION

1.5.1 PILOT IN COMMAND:

Date of Birth	25 th Dec, 1985
License	ATPL
Date of Issue	6 th Jun, 2015
Valid up to	5 th Jun, 2025

Category	Aeroplane
Date of Class I Med. Exam.	6 th Aug, 2021
Class I Medical Valid up to	10 th Feb, 2022
FRTOL Number	9623
Date of issue FRTOL License	20 th Jul, 2021
FRTOL License Valid up to	19 th Jul, 2026
Endorsements as PIC	26 th Jul, 2018
Total flying experience	8820:49
Total flying experience on type	8593:49
Total flying experience as PIC on type	2069:50
Last Flown on type	14 th Sep, 2021
Total flying experience during last 1 year	358:46
Total flying experience during last 6 Months	177:28
Total flying experience during last 30 days	52:24
Total flying experience during last 07 Days (excluding incident flight)	19:38
Total flying experience during last 24 Hours (excluding incident flight)	1:48
Last PPC carried out on	10 th Jul, 2021

1.5.2 FIRST OFFICER

Date of Birth	17 th Jun, 1993
License	CPL
Date of Issue	29 th Jun, 2016
Valid up to	28 th Jun, 2026
Category	Aeroplane
Date of Class I Med. Exam.	17 th Feb, 2021
Class I Medical Valid up to	12 th Mar, 2022
FRTOL Number	20248
Date of issue FRTOL License	29 th Jun, 2021
FRTOL License Valid up to	28 th Jun, 2026
Total flying experience	573:59
Total flying experience on type	367:54
Last Flown on type	10 th Sep, 2021
Total flying experience during last 1 year	219:59
Total flying experience during last 6 Months	142:38
Total flying experience during last 30 days	27:24
Total flying experience during last 07 Days (excluding incident flight)	5:14
Total flying experience during last 24 Hours (excluding incident flight)	Nil
Last PPC carried out on	19 th Jul, 2021

No exceedance in the Flight Duty Time for both the crew was observed as per the record available.

1.6 AIRCRAFT INFORMATION:

1.6.1 The details provided below are as on prior to incident flight:

Manufacturer	Airbus
Aircraft Registration	VT-ITK
Type of Aircraft	Airbus A320
Aircraft Serial No.	7001
Manufacturing year	2016
Certificate of Airworthiness number and issue date	No. 6794 Issue Date: 10 th Aug, 2016
ARC number and Validity	Ref.: IG/ENGG/ARC/2019/27 valid till 4 th Aug, 2022
Category	Normal
Sub Division	Passenger/Mail/Goods
Certificate of Registration	No.: 4684 Category:A
Owner	M/s Subria Three Limited
Operator	M/s Interglobe Aviation Limited
Maximum All Up Weight authorized	73,500 Kg
Last Major inspection was carried out	6000 FH/ 4500 FC/20MO Date: 13 th Sep, 2021
Airframe Hours Since New	15486:40

1.6.2 After the incident, the PFR was reviewed and no related faults messages were observed. Load report was reviewed and code 4400 was observed. Maximum vertical acceleration was recorded as 3.066g. The event was categorised as severe hard landing. Further severe hard landing inspections were carried out (in avionics, airframe & engine systems) as per AMM task 05-51-11-200-004-B and were found satisfactory. Power assurance check as per AMM task 71-00-00-710-806 was carried out and found satisfactory.

1.6.3 Also power acceleration and deceleration checks as per AMM task 71-00-00-710-805 were carried out and found engine was running in normal operating limits as per AMM task 71-00-00-910-803. Magnetic chip detectors and items of scavenge oil filter elements were examined and no signs of bearing or gear distress were observed. Both engines were found satisfactory.

1.6.4 After the incident, as advised by Airframe & Engine manufactures, all inspections including severe hard landing inspections as per AMM were carried out & no abnormality was observed. Aircraft was released to service.

1.6.5 Weight and Balance

- There were total of "167" passengers, "4" cabin crew and "2" pilots.
- Take Off fuel - 8100 Kgs
- Take off Weight (Max) – 73, 500 Kgs
- Take off Weight (Actual) – 65, 832 Kgs
- MACTOW 28.7 %
- Landing Weight (MAX) – 67, 400 Kgs
- Landing Weight (ACTUAL) – 61, 557 Kgs

1.7 METEOROLOGICAL INFORMATION:

Meteorological report at the time of incident are as under:

METAR from VECC, Calcutta / Dum Dum (India)
METAR VECC 151630Z 00000KT 3600 HZ SCT018 SCT100 28/27 Q1006 NOSIG= METAR VECC 151600Z 00000KT 3600 HZ SCT018 SCT100 28/27 Q1006 NOSIG= METAR VECC 151530Z 00000KT 3600 HZ SCT018 SCT100 29/27 Q1007 NOSIG=

1.8 AIDS TO NAVIGATION:

Kolkata Airport is equipped with navigational aids like ILS, DME, DVOR, etc. All Navigational Aids fitted on the aircraft and installed at Kolkata Airport were working satisfactorily.

1.9 COMMUNICATION:

There was always two-way communication between the aircraft & ATC.

1.10. AERODROME INFORMATION:

Kolkata Airport is known as Netaji Subhas Chandra Bose International Airport, Kolkata. Earlier it was known as Dum Dum Airport. It is largest airport in the eastern India. It is located 17 Km from Centre of the city.

Airport Name : Netaji Subhas Chandra Bose international airport
 ICAO Code : VECC
 IATA Code : CCU
 Coordinates : 223914.27N 0882648.21E
 Aerodrome Elevation : 20 ft
 Runway : 19L/01R, 19R/01L
 Hours of Operation : 24 hours
 Fire Category : 09

Declared distances:

R/W	TORA(M)	TODA(M)	ASDA(M)	LDA(M)	THR Elevation
19L	3633	3633	3633	3207	18 FT
01R	3633	3633	3633	3633	18 FT
19R	3271	3271	3271	3183	17 FT
01L	3271	3271	3271	2833	18 FT

1.11 FLIGHT RECORDERS:

1.11.1 COCKPIT VOICE RECORDER: The details of CVR installed on the aircraft is as follows:

P/N	980-6023-023
S/N	CVR-06071

As per CVR recording, the approach briefing was carried out by crew before asking descent from ATC. After obtaining necessary clearance the aircraft initiated descend. It was also observed that the PIC and First Officer carried out the checklist and followed the SOPs. The PF was following the instructions and configured the aircraft accordingly. When, PIC noticed the high vertical speed of the aircraft, he advised PF to flare. No response from PF was heard after that and aircraft touched the runway and made a hard landing. PIC took over the controls after the landing of the aircraft.

1.11.2 DIGITAL FLIGHT DATA RECORDER: The details of DFDR installed on the aircraft is as follows:

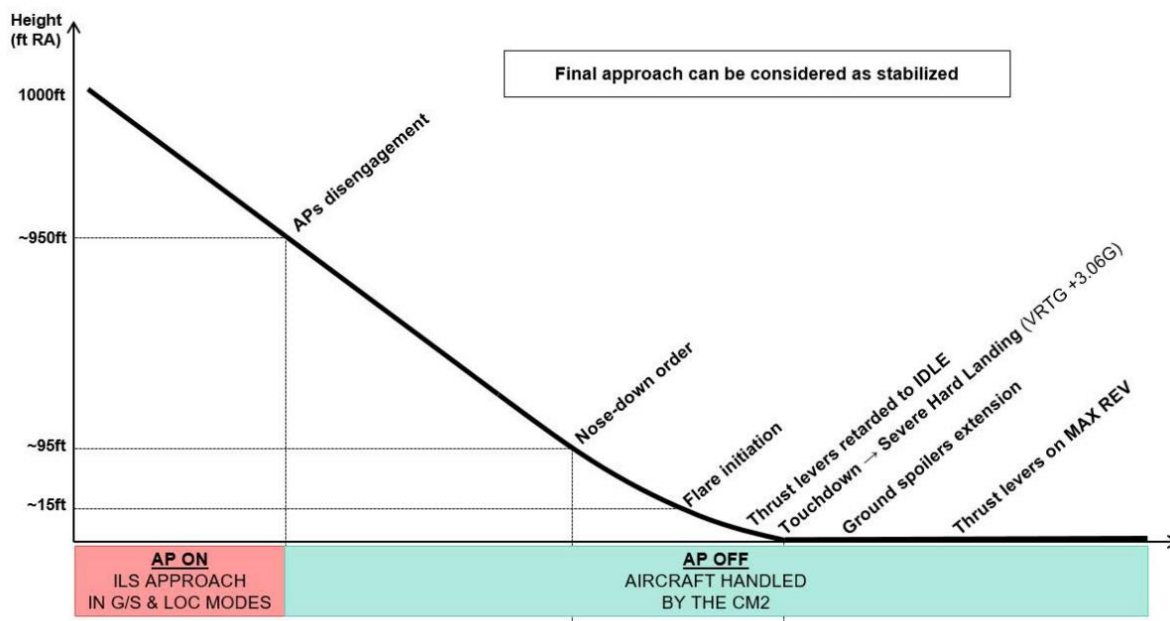
P/N	980-4750-002
S/N	FDR-08177

The raw DFDR data was downloaded and sent to M/s Airbus for analysis. M/s Airbus analysed the data with all relevant parameters available. The sequence of events is as follows:

As per DFDR data, aircraft controls were with the First Officer (PF). Takeoff, cruise and climb were uneventful. During final approach at around 950ft, both autopilots and Flight Directors were engaged in G/S and LOC modes. Then, both autopilots were voluntarily disengaged and the aircraft was manually handled by the PF with the A/THR active in SPEED mode. Rate of descent was approximately 700ft/min.

At 500ft, (stabilization height recommended in VMC), the aircraft was on the correct lateral and vertical flight path and was in landing configuration. The thrust was stabilized, and the aircraft was at target speed for approach. The final approach can be considered as stabilized. Between ~240ft RA and ~170ft RA, the glide slope deviation exceeded its callout value for ~7s. Then the aircraft recovered the glide path.

At 95ft, above the runway, the sudden pitch input (nose down) was recorded by the PF. The pitch angle reduced from 4.5 degree to 3 degree, resulted in an increase of vertical speed from 600 ft to 850 ft. The PF initiated the flare at around 15ft RA. The pitch angle increased to 4 degree before reducing to 3.5 degree. The rate of descent reduced to 600ft/min. The vertical acceleration at the time of touch-down was recorded 3.066g against the structural limit 2.6g as specified by the manufacturer. No input from the PIC was recorded till touchdown. After landing the PIC took over the controls.



1.12 WRECKAGE & IMPACT INFORMATION:

Aircraft landed safely on main landing gear and heavy landing report was auto-generated. Detailed inspection was carried out as per severe hard landing inspection schedule. No damage to the aircraft was observed. Aircraft was released to service, post disposition from manufacturer.

1.13 MEDICAL AND PATHOLOGICAL INFORMATION:

The scrutiny of the preflight medical check for alcohol documents revealed that both crew were not under influence of alcohol at Chennai.

1.14 FIRE: There was no fire at any stage.

1.15 SURVIVAL ASPECTS: The incident was survivable.

1.16 TESTS & RESEARCH: Not applicable

1.17 ORGANIZATIONAL & MANAGEMENT INFORMATION:

M/s Indigo is a low cost model airline with its head office at Gurugram. It has a fleet of Airbus A321, A320 and ATR. The airline started its operation in the year 2006. The airline has approx. 278 aircraft in its fleet and operates to various domestic and international destinations.

1.18 ADDITIONAL INFORMATION:

As per **FCTM PR-NP-SOP-250 FLARE AND TOUCHDOWN**

- From stabilized conditions, the flare height is about 30ft RA.
 - The flight crew should:
 - Control the rate of descent prior to the initiation of the flare (rate not increasing).
 - Start the flare with positive (or “prompt”) backpressure on the sidestick and holding as necessary.

Late, weak or released flare inputs increase the risk of a hard landing.

- If the flare is initiated too late, then the pitch changes will not have sufficient time to allow the necessary change to aircraft trajectory.

1.19 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUES: Nil

2.0 ANALYSIS:

2.1 AIRCRAFT:

The Aircraft VT-ITK had valid certificate of Airworthiness, Certificate of Registration and ARC before operating the incident flight. Last ARC was issued on 6th Aug, 2021 which was valid till 4th Aug, 2022. All the inspections were carried out as per the approved schedules. Last major inspection of 6000 flight Hrs/4500FC was carried out on 13th Sep, 2021. Till the time of incident, the aircraft had logged in 15486 Air frame hours since new.

After the incident, as advised by Airframe & Engine manufactures, all inspections including severe hard landing inspections as per AMM were carried out & no abnormality was observed. Aircraft was released to service.

From the above, it is inferred that the maintenance aspect was not the contributory factor to the incident.

2.2 WEATHER:

Weather was normal throughout the flight and no significant change was observed.

2.3 FLIGHT CREW:

PIC had 8820:49 hrs of total flying experience out of which 2069:50 hrs as PIC on type. He was not involved in any accidents or serious incidents previously. First Officer had total flying experience of 573:59 Hrs out of which only 367:54 Hrs on type. She was not involved in any accident or serious incident previously.

Both crew had valid licenses. Both the crew were not under the influence of alcohol. FDTL of both the crew was within limit.

During the incident flight, the FO was the pilot flying (PF) and PIC was the pilot monitoring. The aircraft took off from Chennai at 13:55:17 UTC. The takeoff, climb, cruise and approach were uneventful.

Crew received the weather at the destination prior to descent. CCU ATIS reported no significant weather affecting the approach and landing. The PF prepared for the approach as per procedures. A managed descent was commenced at top of descent.

The approach was stabilized. The PF disconnected the autopilot at 950 ft AGL and followed the flight director (FD) manually. At approx 95 ft RA, nose down input was given, the pitch angle decreased from 4.5 degree to 3 degree and rate of descent increased from 600 ft/min to 850ft/min.

The increased vertical speed required an earlier flare. PIC advised PF to flare. However, PF initiated the late flare at around 15 ft RA and gave inadequate flare input with a half of full back stick order then released it slightly. Subsequently, pitch angle increased from +3° to +4° before decreasing to +3.5° (nose up). Rate of descent decreased towards ~600ft/min.

Just before touchdown, PF retarded the thrust levers to the IDLE detent leading to A/THR disconnection.

There was no intervention from the PIC at any point of time for taking over controls till touchdown. Touchdown occurred at 15:59:33 (UTC) and vertical load as per DFDR at time of landing was 3.066 g.

The delayed and inadequate flare input by the PF applied from a significant rate of descent did not enable to sufficiently change the aircraft trajectory before the touchdown to avoid the hard landing.

There was no injury to any person on board the aircraft. There was no fire at any stage. Also there was no damage to the aircraft.

From the above, it is evident that the crew handling was the contributory factor to the incident.

3.0 CONCLUSION:

3.1 FINDINGS:

- 3.1.1 The aircraft had valid Certificate of Airworthiness at the time of incident. The ARC was also valid. All maintenance schedules, mandatory modifications and checks were carried out as per the requirements. There were no defects / snags pending rectification.
- 3.1.2 The weather at the airport at the time of incident was fine.
- 3.1.3 The aircraft was under command of an appropriately licensed ATPL holder with a CPL holder as the First Officer.
- 3.1.4 The crew were well rested prior to the operation of flight and were not under the influence of alcohol.
- 3.1.5 During the incident flying the FO was the pilot flying and PIC was the pilot monitoring.
- 3.1.6 The takeoff, climb, cruise and approach were uneventful. The aircraft started descend into Kolkata at 15:31UTC.
- 3.1.7 The approach was stabilized. The autopilot was disengaged by the PF at 15:58:17UTC at 950 ft RA while the autothrust remained engaged.
- 3.1.8 The descent rate was maintained at an average of 700 feet/minute during the approach.
- 3.1.9 At approx 95 ft RA, nose down input was given, the pitch angle decreased from 4.5 degree to 3 degree and rate of descent increased from 600 ft/min to 850ft/min.

- 3.1.10 The increased vertical speed required an early flare. PIC advised PF to flare. However, PF initiated the late flare at around 15 ft RA and gave inadequate flare input with a half of full back stick order then released it slightly. Pitch angle increased from +3° to +4° before decreasing to +3.5° (nose up). Rate of descent decreased towards ~600ft/min.
- 3.1.11 Just before touchdown, PF retarded the thrust levers to the IDLE detent leading to A/THR disconnection.
- 3.1.12 There was no intervention from the PIC at any point of time for taking over controls till touchdown.
- 3.1.13 Touchdown occurred at 15:59:33 (UTC) and vertical load as per DFDR at time of landing was 3.066 g.
- 3.1.14 The aircraft made a hard landing at runway 19L of Netaji Subhas Chandra Bose international airport (VECC), Kolkata.
- 3.1.15 There was no injury to any person on board the aircraft. There was no fire at any stage. Also there was no damage to the aircraft.


3.2 PROBABLE CAUSE:

The Incident occurred due to delayed and inadequate flare input by the pilot flying during landing.

4.0 SAFETY RECOMMENDATIONS:

Necessary corrective training to be given to the involved crew.

Date: 28th Oct, 2022
Place: New Delhi


(Payal Agarwal)
Investigator-in-charge