FINAL INVESTIGATION REPORT ON SERIOUS INCIDENT TO AIRINDIA CHARTERS LTD AIRCRAFT , B737-800NG, VT-AXJ NEAR POSITION PARAR IN VABF 26.05.2010.

1.	Aircraft		
		Type	Boeing 737-800 NG
		Nationality	INDIAN
		Registration	VT-AXJ
2	Owner/Operator		AIR INDIA CHARTERS LTD.
3	Pilot – in –Command		
		License	ALTP
		Extent of injuries	Nil
4	Co-Pilot		
		License	CPL
		Extent of injuries	Nil
5	No. of Passengers on board		113
	Extent of Injuries		Nil
6	Last point of Departure		Dubai
7	Intended landing place		Pune
8	Place of Incident		After PARAR before DOGET way Point
9	Date & Time of Incident		1753 UTC Approx.

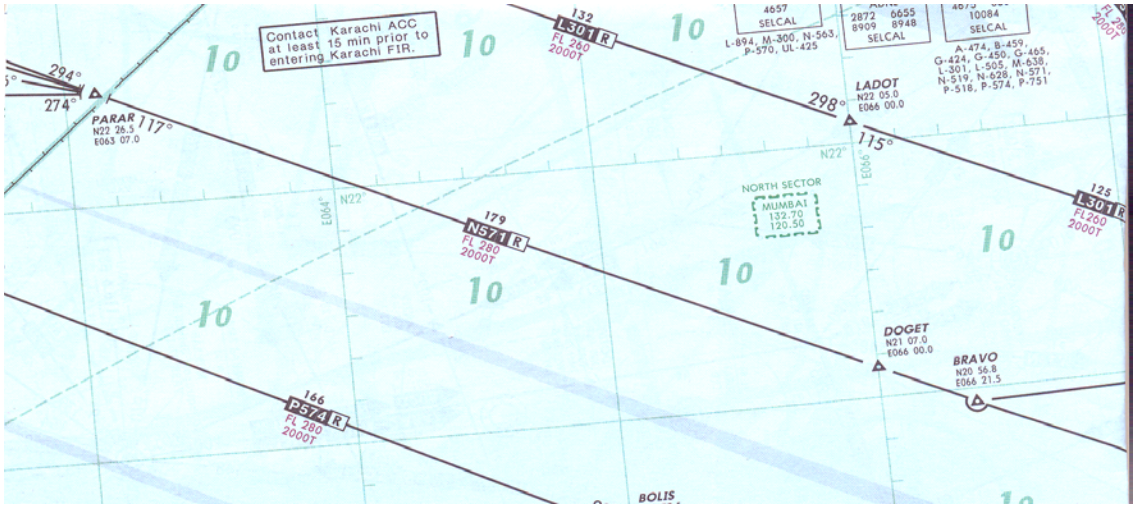
ALL TIMINGS IN THE REPORT ARE IN UTC

SUMMARY

1. FACTUAL INFORMATION.

1.1 History of flight

The aircraft was scheduled to fly on sector DUBAI – PUNE with flight no IX-212, the aircraft was flying on route N571. The departure from Dubai was at 16:30 Z. The aircraft was cruising at FL 370, with Auto Pilot CMD 'A' and Auto Throttle engaged. At 17:53 Z after aircraft crossing PARAR and before reaching DOGET, the Commander left the cockpit for the washroom, however it was noticed by him that toilet was occupied hence he wanted to return.



The incident happened immediately after crossing PARAR at 17:53Z.

At this moment he realized that, aircraft has gone into nose down configuration. The commander immediately wanted to enter into cockpit and retrieve the situation; however Cockpit door was not opening. He used the emergency access code to enter the cockpit. The total duration that he was out of the cockpit was approximately 40 seconds. The time taken after using emergency access code to release the cockpit door lock is maximum up to 30 seconds for the activation of Auto unlocks features. At the same time CCIC(Cabin Crew In-charge) was paging to Cockpit however there was no answer from cockpit. On entering the cockpit Captain saw aircraft is approx in 26° pitch down attitude, speed in red band throttles full back and with 5° of left bank. The aircraft was controlled manually and arrested Rate of Descent, he switched ON continuous relight and resumed level flight. There after Level Change was used to climb FL 370 the duration was approx 20 sec. He Climbed to FL 370 and turned right to get on given track. A/P was engaged in LNAV/VNAV (Lateral Navigation /Vertical Navigation) normal

modes. CCIC was informed about operations normal. There was no injury to passenger and crew. PA announcement to passenger were made. Thereafter flight operated normally and Landed safely at Pune at 19:40 Z.

1.2 **Injuries to persons. Nil**

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	Nil	Nil	Nil
SERIOUS	Nil	Nil	Nil
MINOR	Nil	Nil	Nil

1.3 D**amage to aircraft.** There was nil damage however the aircraft experienced positive g of 2.02 g and negative g of -0.2g, however necessary inspections were carried out as per AMM 05-51**.**

1.4 **Other damage: Nil**

1.5 **Personnel information:**

1.5.1 **Pilot – in – Command:**

Age:	39 yrs approx
License:	ALTP
Date of Issue:	19th April 2007
Valid up to:	18th April 2011
Category:	AEROPLANE
Class:	Single/Multiengine Land
Endorsements as PIC:	i. CESSNA T 303 ii. KING AIR C 90A ii. TB : 20 v. BOEING 737-800
Date of last Med. Exam:	6th May 2010
Med. Exam valid up to:	5th Nov 2010
Total flying experience:	6129:05 Hrs
Experience on type:	870:00 Hrs
Experience as PIC on type:	700:00 Hrs
Total flying experience during last 90 days:	140:00 Hrs

Total flying experience during last 30 days:	22:00 Hrs
Total flying experience during last 07 Days:	01;25 Hrs
Total flying experience during last 24 Hours:	4Hrs

1.5.2 **Co-Pilot:**

Age:	25 yrs 11 Months approx
Licence:	4793
Date of Issue:	12th JUNE 2006
Valid up to:	11th JUNE 2011
Category:	CPL
Class:	Multi Engine, Land /Sea
Endorsements as PIC:	B737-800
Date of last Med. Exam:	05th March 2010
Med. Exam valid up to:	04th March 2011

Total flying experience:	1310 Hrs
Experience on type:	968:10 Hrs
Experience as PIC on type:	Nil
Total flying experience during last 90 days:	146:15 Hrs
Total flying experience during last 30 days:	45:15Hrs
Total flying experience during last 07 Days:	25:40Hrs
Total flying experience in last 24 Hours:	04:00 hrs

1.6 Aircraft information:

A/C Registration;	**VT-AXJ**
Type of A/C;	**B737-800 8HG**
A/C MSN:	**36325**
A/C Line No.:	**2142**
A/C VAR No.:	**YL463**
ENG # 1 Sr. No.:	**894358 (CFM56-7B27)**
ENG # 2 Sr. No.:	**894379 (CFM56-7B27)**

DFDR P/N: **980-4700-042**
DFDR S/N: **2174**
Last ARA: **18/12/2009**
First C of A Date : **5/1/2007**
C of A renewed on: **2/1/2008**
CRS issue dates:

1) DXB - PNQ dated 26/05/2010 (AME Approval No: OA-901)
2) PNQ - BOM dated 26/05/2010 (AME Approval No: AICL/AUTH/100)

Maintenance History:

Maintenance is carried over as per approved Maintenance Program Rev. 4 dated 29.06.09 for B737-800 aircraft.

The last major inspection carried out was Bridging Check (P1). This includes the Tasks under the Phase 4 inspection and phase 1 inspection Carried out at TRV on 30/04/2010. The airframe hours and cycles at the time of inspection were 10706hrs/4282cycles

The airframe hrs and cycles since new at the time of incident were 10932 hrs/4369 cycles.

The airframe hrs and cycles since last renewal of Certificate of Airworthiness is 5595 hrs/2240 cycles

- There was no inspection pending or due on this aircraft.

- All mandatory modifications which were due; were complied on this aircraft.

- As per entry in the tech-log: Sect: DXB-PNQ, Date: 26/05/10
Defect reported: "A/C momentarily in MMO."
Rectification action taken: Structural inspection carried out as per 05-51-04. Found satisfactory. A/C released for further flight. CVR CB pulled. MEL 23-10 invoked.

-As per entry in the tech-log: Sect: PNQ-BOM, Date: 26/05/10

Defect reported: 1) MEL CVR CB
2) NIL sector snags.

Rectification action taken: CVR removed & send to EOD shop as incident reported. Installed new CVR Installation & security of installation

checked. Operation checked. Found satisfactory. Hence MEL 23-10 revoked.

1.7 Meteorological information:

The incident has occurred during the course of enroute navigation when the aircraft was cruising at FL370. The weather was not the factor for the upset of aircraft pitch attitude.

1.8 Aids to navigation:

Navigation flight Plan Jeppesen Charts, FMS were available.

1.9 Communications:

The aircraft had only HF and SELCAL communication facility available at the time incident. The aircraft was in Mumbai FIR and was technically in contact with Mumbai HF at the time of incident.

1.10 Aerodrome information:

Not applicable

1.11 Flight recorders:

1.11.1 Cockpit Voice Recorder*:*

The SSCVR is of Honeywell make Part Number: 9800 6022-001, Serial Number: 13150 was installed on Aircraft. The recording quality of all the Channels was excellent. The transcript of SSCVR was made in presence of both the cockpit crew.

Following are the relevant salient points of the SSCVR related to Incident.

The available recording begins at 17:37:59 UTC.

- At 17:47 UTC Muscat (Radar) control hands over IX-212 over to Mumbai HF. The flight's position report as maintaining flight level 370 along with position estimates was passed, and copied by Mumbai Radio.

- At 17:52 UTC the Captain excuses himself for a minute and the sounds heard in the recording suggest that he may have left the cockpit at about 17:53 UTC.
- At 17:53:27 UTC the cockpit door entry call was heard; and almost immediately a cabin crew member on the Cabin Interphone asking the F/O if she could enter. No reply was heard, and the door was not opened.
- At 17:53:35 UTC the Altitude Alert chime indicates that the aircraft has departed significantly from the selected altitude it was maintaining.
- At 17:53:37 UTC (10 seconds after the normal cockpit entry call was heard) the emergency door opening tone sounded. At **17:53:49** UTC the **PIC Enters** the cockpit to the sound of the **MMO exceedance clacker.** At **17:54:18 the Autopilot-Disengaged wailer** sounded. The **clacker sound stopped at 17:54:25.**

- It might be surmised from the transcript and the rest of the recording that:

A) The aircraft was restored to its assigned flight level by about **1800 UTC**

B) There was commotion in the cabin for a couple of minutes, and the CCIC was asking the passengers to fasten the seat and making an attempt to secure the cabin thereafter passengers were effectively reassured by the cabin crew.

C) The flight was completed normally.

1.11.2 Flight Data Recorder

The DFDR data show the airplane in a cruise configuration at 37,000 feet with the autopilot and auto throttle engaged. A nose-down column input was recorded on the first officer's (FO's) column, which engaged control wheel steering pitch mode, and the aircraft began to pitch nose-down. This nose-down column continued with a gradually increasing force, relaxing for a short period before increasing again, as the airplane Mach number passed MMO (causing the over speed warning discrete to indicate "over speed") and the normal load factor reached -0.2 g's. As the airplane reached approximately -22° pitch attitude, a split in the column sensor force and position data was recorded, indicating opposing inputs from the captain and FO's column. After this point, the column position and sensor force

realigned as the airplane began to pitch nose-up and the Mach number reached a maximum of 0.888. The airspeed gradually decreased as the pitch attitude and altitude leveled off. The airplane completed the rest of the flight without incident. There were no fluctuations, before or during the event, in angle of attack, normal load factor, or the recorded winds, which would have indicated the presence of atmospheric disturbances. A desktop engineering simulation match generated with the recorded airplane configuration and control inputs showed the airplane responded as expected to control inputs from the crew.

DFDR Data Analysis:

The DFDR data show the airplane in a cruise configuration at 37,000 feet. The autopilot and auto throttle were engaged in Vertical Navigation (VNAV) and Speed mode, respectively. At time 4764 seconds, a nose-down column command was recorded. The column sensor force reached approximately 20 lbs, and caused the autopilot to transition to control wheel steering pitch mode. This initial nose-down column command was relaxed, but then steadily increased, reaching approximately 60 pounds (time 4779 seconds). The airspeed began increasing, and the airplane reached a pitch attitude of -5°. Three seconds later the pitch command transitioned to nose-up, and remained nose-up for four seconds. At time 4787 seconds, a sharp nose-down column command was recorded. The column moved from approximately 1 degree nose-up to 5.5° nose-down. At this point, the column force then gradually began to increase in the nose-down direction as the pitch attitude decreased and the airspeed increased. At time 4794 seconds the overspeed warning discrete indicated "overspeed" as the airplane Mach number increased past 0.82, the maximum operating Mach (MMO). When the overspeed warning discrete indicated "overspeed," the airplane was pitched at -13° and was at an altitude of 34,900 feet. The nose-down column command continued until time 4800.5 seconds. At this time, a split in the position and sensor force is recorded between the captain and first officer's (FO) columns. The left column force sensor reached 130 pounds nose-up, as the right column force sensor reached -200 pounds nose-down. Two seconds later the left and right column positions rejoined as the airplane reached a pitch attitude of -23°. The airplane then began to pitch nose-up and increase speed, reaching a maximum Mach of 0.888 at time 4806 seconds (Dive Mach (MD) = 0.89). The airplane remained above MMO until time 4831 seconds, while the airplane gradually increased pitch attitude. During the event the

airplane descended from 37000 feet altitude to 30200 feet. The normal load factor reached a minimum of -0.2 g's and a maximum 2.1 g's. The auto throttle was engaged for the duration of the event. As the airspeed increased, the throttles reduced, eventually reaching idle as the auto throttle attempted to maintain the selected Mach number. The autopilot was engaged during the majority of the event. After time 4764 seconds, control wheel steering pitch was engaged, and after time 4769 seconds control wheel steering roll was engaged. The autopilot was disconnected at 4823 seconds. From the point of the initial column push (time 4764 seconds) to time 4801 seconds, the column inputs were being made by the FO. This is determinable from the sensor force on the FO's column being larger during this period. Also during this period, the force and position of the two columns began to deviate as the force became greater. This behavior is expected on the 737NG. Above 20 pounds of force, the sensor forces will begin to deviate, with the column that is driving the motion having the larger force. From time 4801 to 4803 seconds, the column sensor force and column position for the captain and FO move in opposite directions, indicating opposite inputs from the captain and FO columns. After time 4803 seconds the data come back together indicating one column is again driving the movement. After time 4803 seconds the captain's column sensor force was larger, indicating the captain's column was driving the movement.

The airplane completed the rest of the flight without incident. There were no fluctuations, before or during the event, in angle of attack, normal load factor, or the recorded winds, which would have indicated the presence of atmospheric disturbances.

Kinematic Consistency Analysis:

A kinematic consistency analysis (KINCON) was conducted on the provided DFDR data. KINCON is used to correct inherent inconsistencies often present in FDR data because of sample rate differences, multiple independent data sources, and the presence of instrumentation biases. The KINCON process uses integrated acceleration data to ensure basic inertial parameters such as altitude, ground speed, and drift angle are compatible and comparable. The output is a kinematically consistent set of data with acceleration biases removed, allowing calculations of wind data. The KINCON results show wind conditions that are in line with the recorded winds. The winds were light, approximately 10-20 knots, and relatively constant from the north. These light, constant winds, along with no fluctuations

in the angle of attack vanes, airspeed or normal load factor indicate the airplane was flying through calm air before and during the event.

1.12 **Wreckage and impact information:**

Not applicable.

1.13 **Medical and pathological Information:**

The medical records of PIC was requisitioned for scrutiny and found that, there was no major illness except treatment taken on 24th May 2010 for severe back pain (LUMBAGO). He had taken sick leave from 15th May 2010 to 23rd May 2010. He had reported the same ailment on 21st July 2006 and 6th November 2006.

In case of First Officer no serious ailment physical or psychological was reported.

There is no Preflight Medical Check facility at Dubai hence no Preflight Medical was done for cockpit crew. The AICL policy is that the post flight medical check is carried only when express directive is issued by the Executive Director(Medical/Operations)

1.14 **Fire:**

Not Applicable

1.15 **Survival aspects:**

The continuation of rapid descent would have led to Catastrophic structural failure of aircraft in air. The yanking of control column by PIC could have also resulted in loss of pitch control surfaces.

1.16 **Tests and research:**

Simulation at BOEING Facility:

The 737-800 Boeing desktop engineering simulation was used to re-create the excursion and determine if the airplane behavior matched expected behavior with the recorded control inputs. The simulation was set up with similar initial conditions (e.g. weight, speed, etc.), control inputs and throttles inputs, to the recorded QAR inputs. Elevator, wheel, and rudder math pilots were used to drive the simulation controls, and the resulting match was very close to the recorded data. There was little difference between the recorded and

simulation elevator data, indicating the airplane responded as expected to control inputs.

1.17 **Organizational and management information:**

The chairman of Air India is also the chairman of AICL. The authority to control all the operational activities in M/s Air India Charters Ltd. rests with the Chief Operating Officer.

The Chief of training is responsible for the overall training requirements of all departments. He is to coordinate, plan and ensure implementation of the plan for all training activities in consultation with other departments. However the Chief of Training position was initially with pilot not qualified as per the requirement of DGCA. Subsequently from June 2008 the position was lying vacant till the date of incident.

1.18 **Additional information:**

1.18.1 **Operational Aspect:**

As per the statement of PIC he left the cockpit for the washroom as it was occupied wanted to return back to cockpit. However cockpit door was not opening. He used the emergency access code to enter the cockpit. His duration out of the cockpit 40 seconds out of which 30 seconds elapsed for the activation of Auto unlock features. There was no answer from cockpit. On entering the cockpit he saw the aircraft in 26° pitch down (approx) attitude and speed in red band, throttles full back with 5° of bank. He manually controlled the aircraft and resumed flight using LVL change to climb and arrest ROD. The Cont relight was switched ON. He climbed to FL 370 right turn to get on track then A/P was engaged, LNAV/VNAV (normal modes) engaged. When he asked F/o why he did not open the door he said he was panic stricken. CIC was informed about operations normal. No Passenger or crews were hurt. PA announcement was made to Passenger and normal flight operated to Pune. On being queried as to why he did not follow the RVSM contingency procedure and climb back to the assigned flight level of 370. He stated he forgot the procedure. He was also asked as to why he did not direct CCIC to be in cockpit during his absence from the cockpit, he stated that it was not in SOP.

The First officer stated that as soon PIC left the Cockpit. He was doing his paper work with Flight Plan. The A/T was engaged and speed was 0.76 Mach on the MCP Speed LNAV and VNAV was also engaged. Suddenly CWSR came and I was trying to engage other

mode but later on very quickly CWSP both came. After that very rapidly speed increased. He tried to control the speed by reducing the thrust. In mean time he tried calling PIC as well as through the Attendant button continuous 4 – 5 times. The speed increased rapidly he tried to control the aircraft. The Warning sound started coming than he got into panic situation and couldn't control the aircraft neither open the cockpit door and answer the cabin call. During the pitch down attitude he tried to leave the control column to open the cockpit door but the aircraft pitch increased further and altitude was losing rapidly. In the mean time PIC came through the Emergency access entry. He took over the controls. He reduced the aircraft speed and climbed back to the FL 370. The whole incident was done within 30 – 40 seconds approximately. After the situation was under control the position report was given to DOKET. Aircraft landed safely in Pune. There was no injury to passenger or other cabin damages. The copilot was not involved in any incident as per the records of DGCA.

The cabin crew in-charge stated she was flying as the Senior Cabin crew of IX- 232 of 26th May 2010. she was working at L1door. The incident occurred 1 hour after take off from Dubai. She was in the forward galley preparing the clearance of cart when one passenger came to use the forward lavatory. As the Passenger entered the lavatory immediately the cockpit door opened and Commander came out. He looked at the lavatory door and asked her "Is the lavatory occupied?" she said "Yes" and he turned back to enter into the cockpit when descent was felt. Captain told CCIC to buzz in fast. She buzzed to enter the cockpit but the first officer didn't open the door whereas F/o kept on buzzing me outside. CCIC was continuously buzzing and identifying myself and asking first officer to allow her inside the cockpit but there was no response. By this time Commander had pressed the emergency access code from emergency panel and the light turned green and commander rushed into the cockpit shouting "What are you doing?" And behind him the cockpit door was closed. There was a rapid descent CCIC sat on the forward jump seat and secured herself and shouted at passengers to please fasten seatbelts. CCIC knocked on the lavatory door, the Pax came out and he was made to sit on R1 seat and secured him with shoulder harness. As soon as the commander entered the cockpit the aircraft became straight. She buzzed inside the cockpit to ask if everything was fine but there was no response from the cockpit. Assuming that captains will be busy with the ATC and with their drills, she did not buzz for the 2nd time. After almost 4 – 5 mins when everything was safe, she buzzed in the cockpit again. This time they opened the cockpit door.

She asked Commander “Is everything fine in the cockpit and the aircraft?” Captain said “Yes we are safe.” CCIC came outside and buzzed in the aircraft galley. CCIC asked R2 “Is everything fine in the aircraft?” She said “Yes”. She asked L2. She too said she is also fine and sitting on L2 jump seat secured. During the time of incidence, all the passengers were sitting on their seats and having their meals. There was no passenger standing for the lavatory and because of this no passenger was hurt. But yes they were very much scared and were shouting loudly. All their boxes and liquor bottles fell down. After about 15 – 20 mins. CCIC asked Commander can we continue with our services. He said yes everything is fine now and you can continue. There were all boxes and plastics and bottles fallen in the aisle. Captain made an announcement on the PA that our aircraft went through an air pocket and that is why there was a rapid descent but now everything is safe that we will land in Pune safely. After hearing the announcement, Passengers were relieved. When cabin crew came in the cabin to clear the aisles, Passengers were more relieved. After landing in Pune, CCIC asked Captain what was the reason he said it was an air pocket. When all Passengers deplaned Commander informed me that due to some reasons there will be a delay for take off from Pune.

2. ANALYSIS

2.1 Serviceability:

The First C of A was carried out on 5/1/2007 and it was renewed thereafter on 2/1/2008 The Last ARA was carried out on 18/12/2009. The aircraft was fully airworthy and there were no carry forward snags. The snag reported by pilot at Pune As per entry in the tech-log for the Sector: DXB-PNQ of date: 26/05/10 was “A/C momentarily in MMO”.
The rectification action was taken by carrying out Structural inspection as per 05-51-04. Found satisfactory. A/C released for further flight with CVR CB in pulled. MEL 23-10 invoked.

2.2 Design Aspect :

Boeing 737-800 VT-AXJ aircraft with winglets (YL463) experienced a VMO exceedance during cruise. The QAR data show the airplane in a cruise configuration at 37,000 feet with the autopilot and auto-throttle engaged. A nose-down column input was recorded on the first officer's (FO's) column, which engaged control wheel steering pitch

mode, and the aircraft began to pitch nose-down. This nose-down column continued with a gradually increasing force, relaxing for a short period before increasing again, as the airplane Mach number passed MMO (causing the overspeed warning discrete to indicate "overspeed") and the normal load factor reached -0.2 g's. As the airplane reached approximately -22° pitch attitude, a split in the column sensor force and position data was recorded, indicating opposing inputs from the captain and FO's column. After this point, the column position and sensor force realign as the airplane began to pitch nose-up and the Mach number reached at maximum of 0.888. The airspeed gradually decreased as the pitch attitude and altitude leveled off. The airplane completed the rest of the flight without incident. There were no fluctuations, before or during the event, in angle of attack, normal load factor, or the recorded winds, which would have indicated the presence of atmospheric disturbances. A simulation match generated with the recorded airplane configuration and control inputs showed the airplane responded as expected to control inputs from the crew.

2.3 Operational Aspect:

The First officer stated that as soon PIC left the Cockpit. He was doing his paper work with Flight Plan. The A/T was engaged and speed was 0.76 Mach on the MCP Speed, LNAV(Lateral Navigation) and VNAV(Vertical Navigation) was also engaged. Suddenly CWSR(Control Wheel Steering- Roll) came and I was trying to engage other mode but later on very quickly CWSP(Control Wheel Steering- Pitch) both came. After that very rapidly speed increased. The F/o tried to control the speed by reducing the thrust. In mean time he tried calling PIC as well as through the Attendant button continuous 4 – 5 times. The speed increased rapidly he tried to control the aircraft. The Warning sound started coming than he got into panic situation and couldn’t control the aircraft neither open the cockpit door and answer the cabin call. During the pitch down attitude he tried to leave the control column to open the cockpit door but the aircraft pitch increased further and altitude was losing rapidly. In the mean time PIC came through the Emergency access entry. He took over the controls. He reduced the aircraft speed and climbed back to the FL 370.

3. **CONCLUSIONS:**

3.1 **Findings:**

3.1.1 The aircraft had valid Certificate of Airworthiness and was maintained as per the approved maintenance program. The aircraft had all the mandatory modification complied with.

3.1.2 The flight crew had valid licenses and medical.

3.1.3 The correlation with the CVR examination reveal that at approximately 17.52 UTC, the PIC excused himself to go to washroom with speed window open at 0.76 Mach.

3.1.4 At subframe 4764(17:53:22 Z) the nose down command was recorded with control column force sensor sensing approx 20 lbs from the copilot side. This was due to the copilot adjusting his seat forward and inadvertently pressing the Control Column forward. On this input the autopilot went in to CWS PITCH mode, and within another 5 seconds it had gone into CWS ROLL mode. It is indicative of the fact that the copilot also gave input on ailerons and caused the aircraft to bank.

3.1.5 The altitude alert chime sounded as the aircraft had significantly departed the selected altitude of FL 370 at same time approx (17:53:35 Z) and trying to come back to selected FL by autopilot going in ALT Acquire mode. This chime caused panic in copilot and he applied the push force approx 50 lbs as recorded by sensor in control column.

3.1.6 At subframe 4785(17:53:50Z) at this time the copilot made an attempt to pull the aircraft up however it continued to loss altitude hence he again put the control column forward and aircraft went in further dive.

3.1.7 The PIC had arrived in the cockpit hence the differential input on the control column could be observed. But the PIC applied a approx 125lbs of pull force and got the aircraft in level flight but disconnected the autopilot at subframe 4820(17:54:19Z), after 20 second at 17:54:39 Z engaged Autopilot A and disconnected at 17:54:51 Z, started climbing and turned right on heading 120 to come back on track.

3.1.8 The PIC reached in cockpit when altitude loss was of only 2000 ft and it could be correlated with CVR/DFDR. Subsequently there was application of opposite force by pilot and copilot on control column as the PIC did not takeover as per standard procedure. During this time the aircraft lost 5000 ft and reached FL300.

3.1.9 The PIC did not gradually apply the force to level the aircraft but yanked the control column with approx 125 lb pull force in 2 second and leveled the aircraft in autopilot engaged mode.

3.1.10 The aircraft had reached the maximum operating Mach no of 0.89 at subframe 4831 hence the clacker warning was audible in the CVR. Hence the copilot reduced the thrust to arrest the speed which had gone in red band.

3.1.11 The PIC did not follow the RVSM contingency procedure after the aircraft had dived to the FL 300 in approx 50 seconds and leveled off.

3.1.12 The copilot has not put the seat harness and probably had no clue to tackle this kind of emergency. The jet upset exercise is carried out during simulator check in manual mode and not done with autopilot engaged.

3.1.13 The copilot is not involved in any incident as per the records.

3.1.14 There was complete commotion in the cabin however no passenger got injured as all were seated post dinner service.

3.1.15 The cabin crew had carried all the necessary drill cleaning all the cabin and securing it in case of any emergency evacuation if required.

3.1.16 The Cabin Crew In-Charge permitted R2 flight purser to go in cockpit to brief PIC about the cabin and passengers.

3.1.17 The flight was event free subsequent to incident and aircraft landed safely. All relevant inspection carried out as the aircraft had experienced + 2.1g and – 0.2g respectively.

3.2 **Probable cause of the serious incident**:

The incident occurred due to inadvertent handling of the control column in fully automated mode by the copilot which got compounded as he was not trained to recover the aircraft in automated mode.

Subsequent recovery actions by the PIC without coordination with copilot was the contributory factor.

4. SAFETY RECOMMENDATIONS:

4.1 The appropriate action shall be taken against the involved crew.

4.2 In view of the incident, AICL should review the training curriculum including the simulator training of the pilots to include such in-flight emergencies.

Place: Mumbai

Date: 6.8.2010

(Sanjay K Bramhane)
Deputy Director Air Safety
Inquiry Officer VT-AXJ