

FINAL INVESTIGATION REPORT ON SERIOUS INCIDENT TO
M/s JET AIRWAYS, B737-800 AIRCRAFT,VT-JGM
AT MUMBAI AIRPORT ON 27th Aug' 2010

1. **Aircraft** Type & model :B737-800
Engines :CFM56-7
Nationality :Indian
Registration :VT-JGM
2. **Owner/ Operator** : M/s Jet Airways, Mumbai
3. (a) **Pilot-in-Command** : ALTP Holder
First Officer : CPL Holder
Other crew : cabin crew 4,
One trainee first officer
- (b) **Extent of injuries** : nil
5. (a) **Number of Passengers** : 139
(b) **Extent of injuries** : Minor :21, Serious:4
6. **Place of incident** : Mumbai Airport
7. **Date & Time of incident** : 27th Aug' 2010,1525 UTC
8. **Type of Serious Incident** : **Serious injuries**
during evacuation

(ALL TIMINGS IN THE REPORT ARE IN UTC)

S Y N O P S I S

On 27/8/2010 M/s Jet airways B737-800 aircraft, VT-JGM, was operating jet connect flight 9W-2302 from Mumbai to Chennai under the command of Captain holding ALTP license with First Officer having CPL license and a first officer trainee. There were 139 passengers 4 cabin crew members and 8 ACM cabin crew onboard. Total persons onboard were 154. Aircraft was pushed back from bay A6 at about 1515 UTC. After start up, the aircraft was taxiing on N-taxi track. While taxiing on N7 additional cabin crew(ACM) seated at row 35A apparently observed some fire from left engine and informed to another ACM on Seat 35B who also claimed to have confirmed the fire from the left engine. Immediately ACM seated on 35B got up from his seat and went to the rear galley and informed the captain about the fire. In turn captain asked the cabin crew in charge-CCIC (L1 Position) to confirm the fire. She also confirmed fire to the

Captain. But all the indications in the cockpit were normal and no fire warning was there. However based on the confirmation given by the CCIC he ordered for precautionary evacuation. A precautionary emergency was declared and Engines and APU were shut down. For the purpose of evacuation L2,R1 and R2 slide chutes were deployed and inflated. Also Left side aft over wing exit door and right side both over-wing exit door were opened. During the evacuation time airport fire and rescue services were also deployed. However no foams were discharged as there was no fire/smoke. At the time of incident the taxi track was wet due drizzling of previous hours. Weather was fine. In the process of evacuation 25 passengers were injured and 4 of them were seriously injured with multiple fractures on the legs. There was neither smoke nor actual fire in the incident.

1. FACTUAL INFORMATION:

1.1 History of the flight:

On 27/8/2010 M/s Jet airways B737-800 aircraft, VT-JGM, was scheduled to operate jet connect flight 9W-2302 from Mumbai to Chennai under the command of Captain holding ALTP license with First Officer having CPL license and a first officer trainee. There were 139 passengers 4 cabin crew members and 8 ACM cabin crew onboard. Total persons onboard were 154. Aircraft was on stand A6 and planned to take-off from r/w 27. Surface Movement Control(SMC) approved aircraft for pushback and start up facing east. Aircraft was pushed back from bay A6 at about 1515 UTC. After successful start up, at about 1521 UTC aircraft was initially given taxi clearance for taxiing via L4 and to hold short of "N" taxi way. Subsequently SMC instructed the aircraft to taxi behind spicejet aircraft, continue "N" taxiway to hold short of r/w 14. Aircraft was taxiing on N-taxi track. After turning from L4 to "N" cabin and galley secured for take-off check was given. While taxiing abeam Taxiway N7 additional cabin crew(ACM) seated at row 35A apparently observed some fire from left engine and informed to another ACM on Seat 35B who also claimed to have seen the fire from the left engine. Immediately ACM seated on 35B got up from his seat and went to the rear galley and informed the captain about the fire on interphone. Captain with the help of camera came to know that the call was from the rear side. He took the call and then

confirmed from the ACM self-introduction that he was an ACM travelling crew seated at 35B. After confirming from the ACM on 35B Aircraft was stopped abeam N7 taxi track. Captain requested tower "do you see the fire on left engine". For which tower replied "negative from this side." Later again informed the aircraft "no fire from this side in sight to me, standby". Captain then asked the cabin crew in charge (CCIC) (L1 Position) on interphone to confirm the fire and told her that there is no indication of fire in the cockpit and to go and check the left side. CCIC got up from her position and started moving onto the cabin. By the time aircraft also stopped. CCIC went to the 36th row and checked through the window of 36A. She went back to her position and then confirmed to the captain on interphone that there was fire under the left wing. Captain checked the cockpit and there were no indications or warnings in the cockpit for fire. Mean time at about 1524 UTC SMC advised Follow Me jeep 3 to proceed to the spot near N7 taxiway. Subsequently CFTs were also advised to proceed to the site. Based on the confirmation given by the CCIC, captain of the aircraft decided for precautionary evacuation from right side. On intercom CCIC was informed for the precautionary evacuation from the right side. CCIC asked captain "both the doors". For which he told her to decide. Then the check list for evacuation was carried out. A precautionary evacuation was declared and Engines and APU were shut down. Evacuation command was announced on PA, "Cabin crew- Evacuate, Evacuate, Evacuate". At about 1525 UTC aircraft reported to tower "we have fire on left engine and we are evacuating". CCIC informed L2 on interphone for precautionary evacuation from the right side doors and she did not give instruction for operation of L2 and over-wing exit doors. However For the purpose of evacuation L2,R1,and R2 slide chutes were deployed and inflated. Also Left side aft over-wing exit door and right side both over-wing exit doors were opened. During the evacuation time airport fire and rescue services were also deployed. However no foams were discharged as there was no fire/smoke. **All the crew members confirmed that there was no smoke in the cabin and there was no abnormal smell in the cabin. There was no actual fire in the incident.** At the time of incident the taxi track was wet. There was no rain and wind was light. It was a dark night and all the taxiway lights were glowing. The surface was shining with the wet conditions due to drizzling in the previous hours. There was no damage to the aircraft. However in the process of evacuation 25 pax were

injured and 4 of them were seriously injured with multiple fracture on the legs. All the injured passengers were given first aid at the airport and then shifted to the nearby hospitals for treatment.(sketch of the location of incident attached as **appendix-1**)

1.2 Injuries to persons:

Injuries	Crew	Passengers	Others
Fatal	Nil	Nil	Nil
Serious	Nil	4	NIL
Minor/None	NIL	21	Nil

1.3 Damage to aircraft:

NIL

1.4 Other damage: Nil.

1.5 Personnel information:

1.5.1 Pilot - in - Command:

He had joined Jet Airways on 29/9/2000 As a Trainee First Officer at Mumbai. Later after the completion of induction training he was released as a First Officer on 2nd Oct 2001 on 737-700/800. He became Commander on November 2006 and got endorsement for B737-900 in the same month.

Date of Birth : 16.12.1967
 ALTP : 2982
 Validity : 02.01.2012
 Category : Aeroplane
Date of Medical Examination : 30.03.2010
Validity of Medical : 29.09.2010
Total Experience on Ng aircraft: 8400 hrs
Experience as P1 : 3500 hrs

Experience as P2 : 3500 hrs

As on the date of incident he has the following current ratings/validity.

1. IR/LR valid till 14.09.2010.
2. Refresher valid till - 12.07.2011. (Includes CRM)
3. DGR- valid till 5th July 2011.
4. AVSEC - valid till 11th July 2012
5. Monsoon rating- revalidated on 16th July 2010
6. SEP - valid till 15.07.2011
7. Valid Supervised take-off/Landing approval
8. RTR- valid till 24th Nov 2011.
9. FRTO- valid till 20th Dec 2012.

He was not involved in any incident/accident in the recent past.

1.5.2 First Officer:

Date of joining jet airways	:	04.07.2006
Date of Birth	:	29.10.1970
CPL	:	3593,
Validity	:	16.05.2012
Date of Medical Examination	:	18.01.2010
Validity of Medical	:	17.01.2011
Date of IR/LR checks	:	04.04.2011
Date of Refresher	:	18.05.2010;
Validity	:	17.05.2011
Total Experience	:	2474:54hrs
Experience on Type	:	2099:14 hrs
Released for flying as F/O	:	14.11.2007

First officer was not involved in any accident/incident in the recent past.

1.6 Aircraft Information:

The aircraft was manufactured by M/s Boeing Airplane Company, Seattle USA in the year 2002, 8th Nov. It is Indian registered aircraft and was fitted with 2 CFM56-7 engines. LH engine was fitted at the time of aircraft manufacture and is yet to see the shop for overhaul. LH engine (sl no: 891193) has done 23118 hrs and 14006 cycles since new. RH engine Sl no: 894574, has done 8727 hrs and 6747 cycles since new. The left engine was originally fitted along with the induction of VT-JGM in Jet Airways on 16th Dec 2005. Aircraft was on a quick turn around flight and no defect was reported in the previous flight. There was no defect reported for last one week. Aircraft has undergone major inspection (C4 check) and completed on 24.8.2010. After that there is no defect reported relating to aircraft/engine fire system. The last extended transit inspection was done at Mumbai on 25th Aug 2010. All the mandatory modifications applicable to the airframe and engines were complied with. The engine performance and trend data is also found satisfactory.

1.7 Meteorological information:

As per the MET special report issued at time 1510 UTC for Mumbai airport, Weather was Hazy. Runway in use 27, winds 180/03knots, visibility 2500mtrs, QNH 1003, QFE 1002, temp 27, DP 26, Trend No SIG. However at the time of taxiing it was reported that the taxi track was wet and shining due to drizzling in the previous hours.

Weather was not a contributory factor to the incident.

1.8 Aids to navigation:

N/A

1.9 Communications:

There was always a two way communication between the aircraft and the tower.

ATC tape transcript of conversation between Mumbai tower (SMC frequency) and the aircraft was made and its extract is produced below:

The SMC gave approval to the aircraft at 151606 UTC for pushback and start up facing east. At 152054 UTC SMC cleared for taxiing via L4 , hold short of "N" taxi track and then after reporting short of "N", further gave clearance to continue taxi behind spicejet aircraft, continue "N" to hold short of R/w 14. At 152322 UTC when SMC called the aircraft " confirm are you taxiing". Few seconds later aircraft reported that "we have an emergency. We have fire." It further asked tower" do you see any fire on our left engine". For which SMC reported "Negative from this side". At the same time SMC advised follow Me jeep 3 to proceed to the reported site of Jetair aircraft near N7. At 152410 UTC tower again reported the aircraft " negative. No fire from this side in sight to me. Standby." At about 152534 UTC aircraft reported " we have fire on our left engine and we are evacuating". Subsequently tower advised Fire services also to proceed to the site and informed the aircraft also that they are approaching shortly. At 1525 UTC aircraft reported "we are evacuating". Before the arrival of emergency services itself evacuation started.

As per Apron control-duty manager's report, between 1527 to 1529 UTC Follow me jeeps 4,3,1 and 2 reached the site. Two CFTs also reached the site between 1528 and 1530 UTC. As per Duty Manager-Emergency services on site at about 1527 UTC no fire was noticed from the aircraft. At about 1537 UTC "no visual Indication of the fire" was confirmed to the fire watch tower on R/T and the fire watch tower in turn conveyed the same to the ATC tower.

Communication is not a contributory factor to the incident.

1.10 Aerodrome information:

Mumbai airport has got 2 cross runways with the orientation 09/27 and 14/32. At the time of incident the runway 09/27 was in use. The aircraft was parked on Bay#A6. The aircraft pushed back facing east and thereafter taxied via 'L4' to "N" taxi track. The aircraft stopped abeam N7 due reported fire from left engine. Captain declared precautionary evacuation. Engines and APU were shut down. Precautionary evacuation was carried out on taxi way at the same location.

1.11 Flight recorders:

1.11.1 Cockpit Voice recorder (CVR):

CVR recording revealed that after about 2 minutes of taxiing and was on "N" taxi track, ACM at 35B informed interphone to captain that the left side engine was on fire. When captain asked him with exclamation "left side engine fire" he said "Yes captain". Captain again asked the same ACM in continuation " have you seen fire coming out of engine", he again said" yes captain. Yes captain". Mean time another ACM at 35C also informed CCIC on interphone "Left engine on fire , captain already informed". Then first officer announced "cabin crew at stations" . After that captain/first officer started calling tower. Mean time cabin was announced for all guests to remain seated. Captain after about 5 calls could get tower and informed " we have emergency. Do you see fire from our left engine". For which tower reported "negative. No fire from this side in sight to me, sir." ATC also at the same time advised follow me jeep 3 to proceed to the Jetair site near N7. Captain also called CCIC on interphone and told her to reconfirm the fire," can you go and inspect because indications are absolutely normal, inspect from the window". Then pilots were also discussing " no indications, nothing. May be a spark". Meantime CCIC came back on interphone and informed captain, "she has seen the fire under the left wing". Based on this confirmation of CCIC, Captain declared to CCIC, "precautionary evacuation from right side" and when CCIC asked, "both doors, captain", he told her "you decide, stand-by for the evacuation command". Subsequently first officer informed the tower " we have fire on left engine. We are evacuating" and then evacuation check list was completed. Captain announced cabin evacuation on PA system. In turn CCIC informed L2 on interphone for precautionary evacuation through right side doors.

1.11.2 Digital flight data recorder (DFDR):

DFDR read-out revealed that push back and engine startup and taxiing were normal. There was nothing abnormal indicating LH engine on fire.

1.12 Wreckage and impact information:

The incident happened during taxing. There was neither smoke nor fire from/on the LH engine or below the LH wing. There was no damage to the aircraft except slide chute deployed for evacuation through L2,R1 and R2 side doors.

1.13 Medical and pathological Information:

Both the cockpit crew and trainee first officer had undergone preflight medical examination for the incident flight. After the incident also all the operating crew and all ACM crew were subjected to BA test. They were not under the influence of any intoxicating drugs or alcohol. The records were found to be in order.

1.14 Fire:

There was neither smoke nor fire from/on the LH engine or below LH wing as reported by the cabin crew and ACM cabin crew.

1.15 Survival aspects:

The incident was survivable. However 25 passengers got minor injuries and 4 were seriously injured due to multiple fractures on their leg while evacuating through escape slide chutes and over-wing exits on RH side.

After having confirmed the engine fire below the left wing abeam Taxi track N7 from CCIC, captain ordered for precautionary evacuation from right side. For the precautionary evacuation Engines and APU were shut down. At about 1525 UTC aircraft reported to tower " we have fire on left engine and we are evacuating". CCIC informed L2 on interphone for precautionary evacuation from the right side doors and she did not give instruction for operation of L2 door and over-wing exit doors. However For the purpose of evacuation L2,R1,and R2 slide chutes were deployed and inflated. Also Left side aft over-wing exit door and right side both over-wing exit doors were opened. During the evacuation time airport fire and rescue services were also deployed. However no foams were discharged as there was no fire/smoke noticed from the aircraft/engine as reported by the

aircraft. **All the crew members confirmed that there was no smoke in the cabin and there was no abnormal smell in the cabin. There was no actual fire in the incident.** Incident took place at about 1525 UTC in the night time. At the time of incident the taxi track was wet. In the process of evacuation 25 pax were injured. 13 were treated at MI room and 12 were referred to hospital. 4 of them were seriously injured with multiple fractures on the legs. All the injured passengers were given first aid at the airport and then shifted to the nearby hospitals for treatment. During the interview with the seriously injured passengers It has come to the notice that they all jumped through the over wing exit on left side and right side. One of the lady passengers who got multiple fractures on her leg informed that most of the passengers used over-wing exit on RH side. The other seriously injured lady passenger who exited through RH over wing exit also reported that passengers jumped on her one over the other and some people were carrying luggage also.

At 1532 UTC all passengers were evacuated. At 1610 UTC the last passenger coach dispatched to the terminal and at 1622 UTC full emergency was withdrawn. At 1633 UTC aircraft started towing operation from the incident spot and reached the bay 40 at 1705 UTC. During the rescue process emergency services crew of airport assisted the evacuated passengers and prevented them in running towards the active runway. The passengers evacuated were shifted to main fire station with the help of passengers coach, ambulance and safety jeep along with crew members. 2CFTs, 1 ambulance, 4 operational jeep were used for fire fighting and search and rescue process. The incident site was suitably cordoned by CISF and airport safety department personnel.

1.16 Tests and research:

1.16.1 Engineering checks:

After emergency evacuation of all passengers, aircraft was cleared off the taxiway and brought to the stand no 40. Even though on ground there was no evidence of fire/smoke observed, In order to verify the reported observation of the aircraft the following line maintenance tests and work were carried out . Aircraft was checked visually for external condition including

LH engine for any signs of damage , fire/overheat and nil found. In the cockpit it was observed that both the engines were shut down using engine fire handle but no engine fire extinguishers were discharged by the crew. Engine EEC BITE for recent faults and exceedences were carried out and no defects were observed. LH engine detailed visual inspection was carried out with fan cowl and reverser cowl opened. No abnormalities were observed. LH engine MCD inspection was carried out and nil observation on Aft sump /AGB-TGB. Forward sump MCD was observed 3 pieces of minor non-magnetic particles. Same was within Aircraft Maintenance Manual (AMM) limit and does not have any relevancy on the current event. Subsequently LH engine boroscope inspection was carried out and is satisfactory. Airborne Vibration Monitoring (AVM) download for last 10 sectors were carried out and found satisfactory. Engine was given run-up and found satisfactory. Aircraft was released for further schedule operation on 28.8.2010 at 1140 UTC.

1.16.2. in-situ exercise:

After the evacuation of passengers all the cabin crew were taken to the incident aircraft. There was no sign of smoke or fire from the left engine or below the left wing. They also witnessed the same. Further they were taken to the cabin and asked to check whether they can see the LH engine from the seat 35A. They all confirmed that They could not see LH engine. The anti collision lights of the aircraft(one at top and another at bottom of the fuselage) was asked to switch ON. It started emitting RED light under the bottom of the fuselage. Now this flickering red light emanating from the bottom of the fuselage was reflecting in quick intermittency on the bottom of the wing. This must have created the illusionary situation as such there was fire from the bottom of the wing. All the crew also realized their unawareness about the effect of the anti-collision lights.

From the above exercise it is established that there was no actual fire or smoke from the engine or the bottom of the left wing. It is the illusionary situation due to the red light emanated from the anti collision light at the bottom of the fuselage in line with wing, which reflected on the bottom of the wing with quick intermittency.

1.17 Organizational and management information:

The involved aircraft B737-800 was owned and operated by M/s Jet Airways, Mumbai which is a well established schedule airlines in India. Jet Airways commenced flight operations with three Boeing 737-300 in May 1995 and since then, currently has a fleet of 97 aircraft, which comprises Boeing 777-300 ER, Airbus A330-200, Boeing 737-700/800/900 and ATR 72-500 turboprop aircraft. With an average fleet age of 5.15 years, the airline has one of the youngest aircraft fleet in the world.

Jet Airways operates approximately over 334 flights daily. It maintains three Commercial "Hub" stations. They are Mumbai, Delhi, and Brussels. The major maintenance stations are located at Mumbai, Delhi, Bangalore and Chennai. Over and above these stations there are layover stations where extended maintenance facilities are provided to aircrafts when night parked. The other layover stations in the current schedule are: Pune, Calicut, Cochin and Trivandrum.

Airlines also has an DGCA approved Flight Safety setup to ensure all aviation activities in the airlines uphold the highest level of safety performance and meet national and international standards. Flight safety department, engineering, operations and commercial divisions of the airlines had also rendered full co-operation in the investigation.

1.18 Additional information:

Nil

1.19 Useful or effective investigation techniques:

Nil

2. A N A L Y S I S:

2.1 Serviceability of the aircraft:

On the day of incident Aircraft was on a quick turn around flight and no defect was reported in the previous flight.. There was no defect reported for last one week. Aircraft has undergone major inspection (C4 check) and completed on 24.8.2010. After

that there was no defect reported relating to aircraft/engine fire system. The last extended transit inspection was done at Mumbai on 25th Aug 2010. All the mandatory modifications applicable to the airframe and engines were complied with. The engine performance and trend data is also found satisfactory.

After emergency evacuation of all passengers, aircraft was cleared off the taxiway and brought to the stand no 40. Even though on ground there was no evidence of fire/smoke observed, In order to verify the reported observation of the aircraft the following line maintenance tests and work were carried out . Aircraft was checked visually for external condition including LH engine for any signs of damage , fire/overheat and nil found. In the cockpit it was observed that both the engines were shut down using engine fire handle but no engine fire extinguishers were discharged by the crew. Engine EEC BITE for recent faults and exceedences were carried out and no defects were observed. LH engine detailed visual inspection was carried out with fan cowl and reverser cowl opened. No abnormalities were observed. LH engine MCD inspection was carried out and nil observation on Aft sump /AGB-TGB. Forward sump MCD was observed 3 pieces of minor non-magnetic particles. Same was within AMM limit and does not have any relevancy on the current event. Subsequently LH engine boroscope inspection was carried out and is satisfactory. AVM download for last 10 sectors were carried out and found satisfactory. Engine was given run-up and found satisfactory. Aircraft was released for further schedule operation on 28.8.2010 at 1140 UTC.

From the above it is clear that Serviceability/ maintenance of the aircraft is hence not a factor to the incident.

2.2 Weather:

As per the MET special report issued at time 1510 UTC for Mumbai airport, Weather was Hazy. Runway in use 27, winds 180/03knots, visibility 2500mtrs, QNH 1003, QFE 1002, temp 27,DP 26,Trend No SIG. There was no rain at the time of incident. However at the time of taxiing it was reported that the taxi track was wet and shining due to drizzling in the previous hours.

Weather was not a contributory factor.

2.3 Pilot handling of the situation:

Statement/clarification of the Captain of the aircraft revealed that On 27.08.2010, 9W 2302 was first flight of the day for the commander. Aircraft was parked on A6. Aircraft was pushed back at about 1515 UTC. After successful engine start ATC advised to taxi on Lima 4, hold short of N-taxi track. After reaching N-taxi track, further clearance was given to holding point runway 14, although plan was to take off on runway 27. After taxied out cabin and galley secured for takeoff check was given. After a while he received a call from ACM at 35B that Left engine was on fire. This, he confirmed a number of times from him. A transmission was also made to the ATC to enquire regarding the fire. ATC said "Negative no fire from this side in sight to me". Further to this, an enquiry was made to CCIC and she was advised that his instruments were normal, "would you go and check the Left side". She also confirmed, there was a fire under the Left wing, although there was no indications or warnings in the cockpit for Fire. On intercom CCIC was informed for the precautionary evacuation from the right side. She asked him "both the doors, captain" for which he said "you decide". Then the checklist for evacuation was carried out and at last the evacuation command was given on the PA, "Cabin crew-evacuate, evacuate, evacuate". He said that As per SOP's, the evacuation was carried out and after finishing the checklist, he inspected the cabin for any pax in the cabin and then he was the last to evacuate. Post evacuation, the megaphone, first aid kit, physicians kit was confirmed to be taken by the operating crew members. After evacuation he found out only 01 lady passenger was with a twisted ankle.

He said that he could recognize the call of ACM at 35B on interphone when he called and introduced himself to the captain. With the help of the camera he came to know that the call was from the aft side. He took the call and then confirmed it was an ACM travelling crew. It was while taxiing. At that point of juncture, he did not question the authority of ACM at 35B. However, the information given by him about the fire prompted captain to confirm Fire. For which he said " Yes Captain. Fire was confirmed from left engine" captain confirmed thrice from him. However, he did not talk to L2 but talked to L1-CCIC to check up the fire from left engine.

He further clarified that initially CCIC said that she did not check and after asked her to inspect and confirm, she called back on the interphone saying that "yes confirmed, there is a fire under the left wing". After confirming the fire from ACM-

35B, captain called ATC to confirm the fire from left engine for which he got information from ATC, "Negative no fire from this side in sight to me". Captain confirmed that he did not receive any report from any other aircraft or from ground personnel about the fire from VT-JGM.

He also clarified that As per the company's SOP, there is no such requirement to operate VHF2 to contact company (Dispatch) at any stage after push back and while on ground during taxiing. However after takeoff on change over to area radar or FL 200 whichever is first. Hence I did not use the company channel for confirming the fire or for the purpose of evacuation. **He did not use mobile or any cockpit crew used their mobile during this incident and evacuation process**

He further informed that he peeped through the glass of the side window only (not opened), he could see only a small portion of the leading edge slats and winglet. He did not see any fire. As he was already confirmed by 02 different proficient cabin crew (ACM IFE and CCIC), he did not send the FO/trainee FO for further check to confirm fire physically for prompt actions . Trainee FO was on his 2nd flight as a Pre -SIM training and as such captain did not consider him for that purpose as SOP.

He instructed CCIC, as fire has been confirmed, a precautionary evacuation will be carried out from the right side and to Standby, wait for his command. Although Standard operating procedure (SOP) doesn't recommend **which are the doors to be used for evacuation** he advised CCIC on the interphone for Evacuation from the right side.

In the cockpit it was observed that both the engines were shut down using engine fire handle but no engine fire extinguishers were discharged by the crew. This indicates that there is some dilemma in discharging the fire bottle as there was no real fire.

He said that there was no abnormal smell or smoke felt in the cockpit or in the cabin during the evacuation process. Nor any of the other crew member reported the same. After the complete transportation of the passengers, he took a complete walk around inspection of the aircraft. He found there was no fire/smoke, especially from the LH side. Captain said that Taxiing track was wet, otherwise no rain and light wind was there. It was a dark

night and the taxiway lights were burning. The surface was shining with the wet conditions.

Having known that there was no indication or warning for the engine fire in the cockpit, first officer also did not suggest to the captain that no necessity of evacuation through slide chute/over-wing exit and she could have given the ideal option of returning back to the bay on single engine for normal de-planing of passengers.

From the above it is established that there was no actual fire from the engine or from the wing side. This was confirmed by the captain from the cockpit indications. He also physically checked peeping through his side window and no fire was seen. Tower also confirmed him no fire. Aircraft was on ground and stopped. He completely relied on the illusionary information passed by the overacted ACM at 35B which was wrongly ascertained by the CCIC who was already under the wrong illusionary information of fire from another ACM-CCIC, happened to be her husband. Captain failed to judge the situation and ordered for precautionary evacuation which itself shows that he is not aware of the prevailing actual situation. Normally evacuation is done only for emergency. In the above mentioned situation he could have returned back to the bay on single engine for normal deplaning of passengers.

It is hence clear that lacking the situational awareness captain made wrong decision of carrying out evacuation. First officer also failed to play her role in suggesting returning back to bay on single engine for normal deplaning of passengers as there was no real emergency.

2.4. Role of cabin crew:

2.4.1. Role of Cabin crew in-charge:

Cabin crew in-charge(CCIC) in her statement/clarification explained that how **she confirmed fire on the left engine in the following manner**. She was seated for takeoff on L1 jump seat , the ACM crew seated on the 35C (also her husband)called her on the interphone and informed that the left engine on fire. He reported another ACM on 35B had already informed Captain about

the fire through interphone. She got up immediately and called the Captain on interphone and asked for any briefing. Captain told "stand by" and then captain gave a call on interphone and told her that there was no indication of fire in the cockpit and told her to check and confirm. Before she went in the cabin for checking the aircraft had already stopped. By the time she went to the 36th row for checking ACM(35B) and ACM 35C were standing and she checked through the window of 36A and saw fire from the bottom of the wing. At the same time ACM-35B told her that he also saw the fire. She went back to her position and confirmed to the captain that she herself saw the fire. Thereafter the captain came on PA and said cabin crew at stations. Then captain called her on interphone and said they will be conducting a precautionary evacuation from the right side doors.

She further clarified that Captain instructions for evacuation were conveyed through interphone to L2 cabin crew. The moment she kept the interphone down the captain came on PA and announced "cabin crew, evacuate-evacuate-evacuate". This is also confirmed from CVR recording. She checked the external conditions through the R1 door and checked that the door was armed and open the door and pushed the door with force so that the slide will inflate. Slide got deployed and inflated properly. Meantime R1 crew was controlling the passengers. However she did not give any instruction specifically for operation of L2 door and over wing exit on both side. After that evacuation was executed through R1 door. At that time she observed that Some of the passengers were seen moving toward the over wing exit and rear side. The emergency evacuation command were given by her and R1 crew for evacuating the passengers from R1 door. The evacuation command was given by shouting "EMERGENCY, EMERGENCY, RELEASE SEAT BELTS, REMOVE SHOES, LEAVE EVERY THING, HURRY HURRY, COME THIS WAY AND JUMP". One of the ACM at 10A came forward to R1 and she instructed her to slide down after few of the passengers evacuated and assist the passengers. Few of the passengers evacuating from R1 door jumped with shoes on but nobody with luggage. One of the male passenger with infant also evacuated from the R1 door. A lady passenger came with her luggage to R1 door however the luggage was taken back from her and was evacuated from R1. she did see some passengers rushing toward the over-wing exit on right side. she did see some of the cabin lockers open.

Neither had she instructed the crew members for using megaphone nor did she use the megaphone inside the aircraft however it was taken down by R1 crew to control the passengers.

She also reported that no passenger was opening any of the over-wing exit door or any of the slide chute. she checked right side before opening the door. **She did not get any information from any other crew members prior to evacuation or during evacuation about the opening of L2 door and over wing exit door by the passengers.**

She did not smell anything abnormal in the cabin prior to evacuation or during the evacuation. She also reported that **emergency torch light was not used during the evacuation from the cabin.** She also said that **no pax was sliding through L2 door.**

she said About 80 seconds were taken for **complete evacuation.** **She ensured the complete evacuation of the passengers.** Before she informed to the cockpit the completion of evacuation when she was removing the emergency equipment saw P1 and P2 coming out of the cockpit. She saw P3 going toward the over wing exit.

She also confirmed that she did not allow any of the ACM crew to operate the interphone or to contact the cockpit crew, however they did not speak to her before using intercom to talk to the cockpit crew. Operating crew at rear side also did not inform her about the ACM crew activities. She accepted that except in giving the specific instructions and confirming the action of the other crew member she performed her role as CCIC. When the ACM-35C informed her about the fire on interphone she thought it was more important to inform the captain but she did not exercise control over ACM. She was aware that there is no role to be played by the ACM crew members in case of emergencies including the present case, as per the company policy. However, **She failed to exercise control on ACM crew members during this present flight.**

On ground after evacuation she and R1 crew took the passengers away from the aircraft. Then she saw coaches , ambulance and fire vehicles were there. She saw few of the passengers moving toward the active runway she went behind them and guided them back to the coaches. She saw one lady passenger was bleeding from her palm and guided her to the ambulance. She reported that No smell of fire or smoke was observed around the aircraft.

She also reported that During her SEP training she has been trained for emergency evacuation for fire depending on external situational assessment however not trained to recognize fire from the engine.

From the above it is established that the CCIC did not instruct to open the rear door L2 or instructed the L2 crew to open L2 door to check for the confirmation of fire from left engine or below the wing. Rather she fully relied on the information from the other ACM (her husband) and ACM at 35B and registered the same information in her mind prior to checking by leaning through the window of 35A. As such from the location of 36A the engine cannot be seen and hence it is not possible to confirm the fire. She also failed to have the control on ACM cabin crew members and allowed them to overact on the situation leading to the chaos in the cabin. She was also not having the basic awareness of the external lights especially the anti-collision lights of the aircraft. She did not ensure proper preparation of the cabin for evacuation and also failed to give proper instruction for orderly evacuation. This had led to the opening of L2 slide and the opening of right side both over-wing exits and left side rear over-wing exit. Passengers injured were mostly those who exited through over-wing exit.

Hence it is clear that CCIC failed to justify her role as CCIC in the incident flight.

2.4.2 Role of Cabin crew at L2:

Cabin crew at L2 station stated that After passing the cabin galley secure check to the L1, after some time ACM-35B and ACM-35C came running to the galley, told her the left engine was on fire. 35B took the L2 interphone and informed the Captain. 35C took the R2 interphone and informed the L1, about the fire. She tried to see outside from the last 02 rows but could not see a fire. By that time Capt came on the PA to tell the crew to be at their stations. Then she checked the external conditions of both the doors (L2 and R2 door) and the door mode Armed and joined the R2. The L1 buzzed back saying that there could be a precautionary evacuation using the Right side, but wait for further instructions. By the time she kept the interphone back, Capt came on the PA, giving order to evacuate. After that there was no PA announcement or Intercom from the L1 or R1. She confirmed that no passenger reported fire. **No passenger (pax) rushed to the rear galley prior to the evacuation command.**

After the evacuation command, she was guarding L2 door by holding the assist handle and facing the door. When the pax was rushing towards the L2 door, she told them to use the other exits. In this process due to the constant rushing of pax due to the force, she fell on one knee. Still she was holding the assist handle in her right hand when she was falling down, and her left hand became free. When she was falling, she was facing the door. She fell in the assist area and the jump seat was in the folded back condition. She could see some of the legs on the floor, when she looked up she saw the L2 door opened. she said she did not open the door and also did not know who opened the door. By the time some pax also jumped using the slide. When She got up ACM-35D who reached L2 area also saw her condition and helped her to stop the pax using the L2 door. Afterwards all the pax had been directed to slide through R2 door. However some of the pax jumped out. She reported some of the pax did not remove their shoes and hand baggage while sliding through the R2 slide chute.

She did not observe any smoke or abnormal smell in the cabin prior to or during the evacuation. She also confirmed that After the PA announcement of Cabin crew at stations, aircraft was slowing down, ACM-35B and 35C moved out of the galley and proceeded towards the over-wing exits. she was standing behind the last row and saw both the ACM's reaching the over-wing exits and they were standing.

She also affirmed that after ACM-35B told her about the fire in the left engine, she went to Row 36 left side and glanced through the window. She did not see any fire from the left side. However she did not inform this to the cockpit. She came back and checked through L2 and R2 door for the external conditions and then gone back to the aisle area just behind the last row. She also confirmed that no crew was down the slide of R2 to assist the passengers.

She also affirmed that the ambulances and pax coaches came little bit about 10 mins after she evacuated through R2 door. Till that time pax were grouped near the aircraft. she did not notice at this stage any pax moving towards the runway. She did not see either fire or smoke around the aircraft or from the aircraft. She could see the fire vehicles standing close by.

From the above it is concluded that having not seen the fire from the left side when she checked from 36th row, She failed to

inform either the cockpit crew or the CCIC. The guarding procedures followed by the crew during evacuation for L2 were not appropriate. L2 side door might have been opened in the chaos by the L2 crew to avoid worsening of the chaos in the cabin and some of the passengers jumped through the L2 slide.

2.4.3. Role of ACM on Seat 35A:

ACM seat on 35A stated and clarified that During her SEP training she has been trained for emergency evacuation for fire depending on external situational assessment however not trained to recognize fire from the engine. During the investigation it was established that the message of presumed fire from the left engine was originated from the ACM seated on 35A, which led to the all subsequent over-action by the other ACMs.

As per her statement She could not see **engine from her seat position**. As the location from where she reportedly saw the fire the first time, she could not think of any other area from where the fire was coming. Hence She presumed fire was coming out beneath the wing (left hand) near the engine area. **She has undergone the training to identify different types of fire and its recognition and the colour of the fire was reported** orange yellow. She said It was long throw in intervals blowing towards the aft. It was not spreading and it was not going up or down. About 05 mins after the starting of taxiing, she noticed fire and it was seen till 02 mins after complete stop of the aircraft on the taxi way. **She did not smell anything abnormal in the cabin during observation of the fire and no smoke in the cabin.**

She had not been taught for identifying the locations and the importance of certain navigational and anti- collision lights. After having reportedly seen the fire from the left side she immediately told ACM seated on 35B. He also leaned over and checked and confirmed a fire.

She reported that there was a total of 08 ACM's on board. 06 were seated on the 35th Row and 02 at different locations- were in the FWD location. She also reported that she knew CCIC's husband- ACM 35C was also traveling in the same flight. ACM on seat 35B is her close friend

She said During the induction training I have been taught in the classroom that on the basis of request from the operating crew, assistance will be provided by the ACM crew. However it has not been documented in the company policies/ procedure which includes cabin crew training manual.

She also affirmed that after hearing the PA announcement from the cockpit "Cabin Crew at Stations", she saw ACM 35B and 35C were proceeding towards the right side over-wing exits. ACM-28D also moved toward the over-wing exit on the left side. Once evacuation command was given by the Captain, Pax got up and started running towards front as well as the rear of the cabin and many of the pax were also holding their luggage in their hand. She then advised the pax to leave their luggage and remove shoes and proceed towards the aft for evacuation. **She did not see any pax evacuating from L2 Door.** Till the time she evacuated through the R2 door, the L2 door remained closed.

She did say that some of the pax were moving perpendicular to the aircraft towards the active runway. She ran behind them and stopped them and re-grouped them to guide them towards the coaches. She said on ground, the operating crew were speaking on the megaphone and was helping the pax.

She explained that On 24th August 2010, she started her recurrent training at Chennai and it continued for 03 days, thereafter on the 4th day morning she reached Mumbai for completion of recurrent training which covers ditching drill and the fire drill. There were about 25 other crew members along with her and they were from different stations. They reached the training pool at about 1230pm and the ditching training started at 2pm. she was in the 1st batch. As soon as she completed Ditching drill left the training locations at 4 pm for doing the Fire drill training at Powai. She reached the training centre around 5pm. There were about 15 other crew members for doing the fire drill. Her number was 11 to carry out the drill. she completed fire drill successfully at about 06.50pm. Then immediately left for the airport to catch flight 9w-2302. Before doing the ditching drill she had food in the morning as well as in the afternoon and before the fire drill she took some snacks.

From the above it is established that after the completion of hectic day drill of ditching and fire drill she might have got the illusion of fire after noticing the reflection of anti-collision light (RED light) on the bottom of the wing. She has not been taught for identifying the locations and the importance of certain navigational and anti-collision lights. She is also not trained to recognize fire from the engine. From her position she could not see the engine. Hence it is safely concluded that she

wrongly presumed the reflection of red light(anti collision light) on the bottom of the wing as fire from the left engine and activated her close friend and ACM at 35A who in turn overacted the situation and informed the captain.

2.4.4. Role of other ACMs:

Statement/clarification of ACM at 35B revealed that during SEP training he has been trained for emergency evacuation for fire depending on external situational assessment however not trained to recognize fire from the engine.

He confirmed that **from his seat location he could not see the left engine.** He said that ACM on 35A informed him of the fire in the left engine. He leaned towards the window and saw intermittent throw of flames coming from under the left wing. The location he saw the flame was nearer to the engine so he presumed it was from engine. **He did undergo the training to identify different types of fire and its recognition** and he said **the colour of the flame was** Orange yellow. It was long throw of about 1 ½ feet in intervals upto 2-3 seconds blowing towards the aft. It was not spreading and it was not going up or down. About 07 mins after the starting of taxiing, he noticed flames and it was slowing down after aircraft speed reduced. However **He did not smell anything abnormal in the cabin during his observation of the flame and no smoke was there in the cabin.**

He has not been taught for identifying the locations and the importance of certain navigational and anti- collision light. However he learnt from Captains about navigational and anti collision lights. By that way he knew, anti-collision lights red in colour, located on the top and belly of the aircraft. The bottom one is around the middle of the fuselage approx in line with the main landing gears. He knew anti collision lights throw the lights with quick intermittency as he has seen while on duties.

Having presumed the fire from the left engine he informed ACM on seat no 35C. He immediately went to the Aft galley, informed L2 and also informed the Captain, through the interphone on the L2 side " Captain this is ----(ACM-35B name), Left side engine on fire". When he spoke to Captain, he said "there is no indication in the Cockpit and he will check" At the same time he felt slowing of the aircraft. L2 did not react on his information. By that time ACM on 35 C also came to the rear galley and informed the CCIC through the interphone at R2

location. On overhearing his conversation, R2 crew went to the 35th row for checking. He came back and told him "Yes, you are right". At any stage, till his presence in the rear galley L2 did not go to the cabin and check for the flame/fire.

Then he and ACM 35C went together to the right side over-wing area. After reaching the over-wing exit row he told the pax seating on seat F to move to seat E and he stood on that row near the over-wing exits. ACM 35C was standing behind him which is also the next exit row. Left side of the Aft over-wing exit, ACM 28D was standing. Before he went nearer to exit row seat, aircraft had stopped completely. At this time PA announcement came from the cockpit "Cabin crew at your stations" After sometime he could hear the noise of flaps operation and engine winding down. Subsequently all the cabin lights (night mode) went off and the emergency lights came on. Finally PA announcement came " Cabin Crew- Evacuate, Evacuate, Evacuate". From the stopping of the aircraft to evacuation commands it took about 02 mins. Having heard the PA announcement for evacuation he opened right side FWD over-wing exit. At the same time the rear over-wing exit was also opened by ACM 35C. Once evacuation command came, all the pax stood up and started rushing towards the exits. He was the first person to evacuate through RH over-wing exit and he was standing on the wing and helping the pax who had evacuate from the over-wing exit. He shouted " Emergency, Emergency, leave bags, bend Low and sit and slide." He could see some of the pax sliding from the exit with luggage and shoes. He could catch hold of some of the baggage and threw it toward the front of the aircraft. At that instance he could not see any ambulances/ search and rescue vehicles. Also there was no assistance available on the ground from Jet Airways at that point of time. After about 10 mins later they came with coaches and the airport ambulances and rescue vehicles. He could see some of the pax grouped together away from the aircraft and near the runway. However he did not see any pax entering the runway. After the completion of evacuation he went back into the cabin, to check whether all pax had evacuated or not. He did see 01 male pax standing on the left side wing and he helped to bring him inside the cabin and evacuated through right side over-wing. At this time the Supernumerary was checking the cabin. After glancing over the equipment locker he finally evacuated through the R1 door. At that time of his final evacuation only CCIC was

inside in the FWD galley. He reported that ACM on seat 35A is his close friend.

He also informed that that around the year 2007, there was a circular issued from Jet Airways, advising that on the basis of request from the operating crew, assistance will be provided by the ACM crew. However it has not been documented in the company policies/ procedure which includes cabin crew training manual.

He did not see any pax evacuating from L2 Door. He reported that some of the pax were moving perpendicular to the aircraft towards the active runaway, and they were stopped and grouped together before entering the runway. He did not see anybody using the megaphone inside the cabin. However he did see R2 crew the operating crew using the megaphone on ground and helping the pax. He also ascertained that after he sat on his location he could see the Bay (A6) was in wet condition. During taxiing, he could see the wetness of the surface on his side, but there was no water pooling.

From the above it is clear that he has overacted beyond the limit and role of ACM crew. He carried forward the wrong message of fire from the left engine passed on to him by his close friend at 35A and overacted to the captain without going through CCIC. Before the evacuation command he made unwanted movements towards the over-wing exit which could adversely attracted the passengers leading to the chaos in the cabin. Also there was no specific instruction from CCIC to him for any assistance during evacuation. Without coordinating with CCIC he opened the over-wing exit on right side along with other ACM-35C. The above over-reaction of ACM-35B is the main cause for the injuries to the passengers.

Statement/clarification of ACM 35C revealed that During his SEP training he has been trained for emergency evacuation for fire depending on external situational assessment however not trained to recognize fire from the engine.

From his seat location he could not see the left engine. He said that ACM on 35B informed him of the fire in the left engine. He leaned towards the window and saw intermittent throw of flames coming from under the left wing. He saw for approximately 05 seconds and the flame was just twice.

The location he saw the flame was nearer to the engine so he presumed it was from engine. Moreover it was informed by his colleague 35B. **He had also undergone the training to identify different types of fire and its recognition** and the color of the flame was Yellowish - orange. It was long throw of about 1 feet in intervals upto 2-3 seconds blowing towards the aft. It was not spreading and it was not going up or down. There was no busting noise. The fire was noticed for about 05 seconds with intermittent 02 throws. **He did not smell anything abnormal in the cabin during his observation of the flame and there was no smoke in the cabin**

He has not been taught for identifying the locations and the importance of certain navigational and anti-collision lights . however he knew, anti-collision lights red in colour, located at belly of the aircraft. The bottom one is around the middle of the fuselage approx in line with the main landing gears. He knew anti collision lights throw the lights with quick intermittency as he has seen while on duties.

After having seen the fire he immediately went to the Aft galley, following ACM 35B who was already in the aft galley. He was informing the captain using interphone at L2 about the fire from the left engine and he used the R2 interphone to inform the CCIC " left engine fire". The aircraft had already stopped, and captain announced on the PA cabin crew at your stations. He and ACM 35B started proceeding towards the over-wing exit. When we were proceeding to the over-wing exit 01 passenger on 36F got up and said "stop the aircraft". ACM 35B told him to be seated. Then he and ACM 35B went together to the right side over-wing area. After reaching the over-wing exit row ACM 35B told the pax seated on seat F to move to seat E and he stood on that row near the over-wing exits. He was standing in front of ACM 345B which is also the next exit row. Left side of the Aft over-wing exit, ACM 28D was standing. Before he went nearer to exit row seat, aircraft had stopped completely. At this time CCIC crossed me and went towards rear cabin and then went back to the fwd cabin. After a while he could hear engine winding noise. Subsequently all the cabin lights (night mode)went off and the emergency lights came on. Finally PA announcement came " Cabin Crew Evacuate, Evacuate, Evacuate". From the stopping of the aircraft to evacuation commands it took about 02 mins. Having heard the PA announcement for evacuation he opened right side AFT over-wing exit. At the same time the FWD over-wing exit was also opened by ACM 35B. Once evacuation command came, all the pax stood up and started rushing towards the exits. Both ACMs(35b,C) were the first to evacuate through RH over-wing exit and he was

standing on the wing and helping the pax who had evacuate from the over-wing exit. One of the passenger was running towards the wing tip on the wing surface, have been stopped by 35B and guided to the ground assistance. Later ACM-35B joined with him for evacuation and shouted "Emergency, "Emergency, release seatbelt, remove shoes, leave everything, bend Low, go that way and sit and slide". He could see some of the pax sliding from the exit with luggage and shoes. At that instance he could not see any ambulances/ search and rescue vehicles. Also there was no assistance available on the ground from Jet Airways at that point of time. After about 10 mins later they came with coaches and the airport ambulances and rescue vehicles. he could see some of the pax grouped together away from the aircraft near tail side. However he did not see any pax entering the runway. After the completion of evacuation he went back into the cabin, to check whether all pax had evacuated or not. He did see at this time the Supernumerary pilot and the Captain were moving towards the rear cabin. Then he evacuated from the right side over-wing exit.

He said CCIC is his wife. He said that around the year 2006, there was a circular issued from Jet Airways, advising that on the basis of request from the operating crew, assistance will be provided by the ACM crew. However it has not been documented in the company policies/ procedure which includes cabin crew training manual.

He did not see any pax evacuating from L2 Door. While he was checking for the fire from through window of 35A, he did see few water droplets on the window, he could also see the wetness of the surface, but there was no water pooling. Taxi lights were on. **There was no specific instruction/request from CCIC during the evacuation process. From the above it is clear that he has overacted beyond the limit and role of ACM crew. He carried forward the wrong message of fire from the left engine passed on to him by ACM35B and overacted to the CCIC. Before the evacuation command he made unwanted movements towards the over-wing exit which could adversely attracted the passengers leading to the chaos in the cabin. There is no specific instruction from CCIC to him for any assistance during evacuation. But Being the husband of CCIC, without coordinating with CCIC he opened the over-wing exit on right side along with other ACM-35B. The above over-reaction of ACM 35C is the main cause for the injuries to the passengers.**

Statement/clarification of ACM 28D revealed that During his SEP training he has been trained for emergency evacuation for fire depending on external situational assessment however not trained to recognize fire from the engine.

He reported that While aircraft on taxiing, he heard a lot of sudden unbuckling of seat belts. When he looked back, he saw ACM-35B heading towards the AFT galley and using the L2 side interphone. After about 30secs, the aircraft came to a halt. 20secs later, he heard the PA announcement, " Cabin crew at stations". After this announcement, he saw ACM 35B and C heading towards the right side over-wing exits in a hurried manner. They were not in uniform. Cabin was very calm. At this moment CCIC crossed his row and went behind and then returned back to the FWD galley. He presumed that there must be something abnormal situation and thinking that no Cabin crew was on the left over-wing exit he got up from my seat and went to the ACM -35C. then he asked 35C "what's happening". He whispered closer to him, "that he saw fire under the left wing". He volunteered and went to the left over-wing exit for evacuation if any, ordered. Then he heard a PA announcement, " Cabin crew- Evacuate, evacuate, evacuate." he was guarding rear side left over-wing exit, facing the door with both the hands on the fuselage. On this row, 03 pax were seated on the left side. On the forward row, left side over-wing exit, again 03 pax were occupying the seat. He saw 35B and C was opening the right hand side over-wing exit. He started acting on evacuation. In the middle of this process, he saw a hand coming under his left hand and operating the handle of the over-wing exit. The over-wing exit guard opened upwards. He was still standing inside the aircraft at the edge of the seat. One pax pushed him aside and jumped outside the over-wing exit. He saw that the pax fell down on the wing. He also jumped out, grabbed him and helped him to bring him back into the cabin. Then he was standing on the wing facing the exit and blocking the way so that no pax was evacuated through the left over-wing exit. Several pax were rushing towards my side but he kept directing them to go to the opposite exit.

At no time passengers reported/ commented on the fire. No pax rushed to the rear galley prior to the evacuation command. He had not seen any passenger opening the right side over-wing exit. Having reached the left over-wing exit area, he did not brief the pax seated for the evacuation. He reported that During

induction training, he did undergo evacuation drill using the slide chute, but not using the over-wing exit. During refresher he did not undergo any such drills. During the induction training covering slide chute drill (Evacuation drill), he has been demonstrated in the aircraft about the guarding of the main doors only and not for over-wing exits, especially under the situation of pax occupying the seat. **He did not observe any smoke or abnormal smell in the cabin prior to or during the evacuation.** When he jumped out of the left over-wing exit, he did not see any smoke/burning smell near the wing. He did not anytime go down to the ground to assist pax during the evacuation. He did not undergo any aircraft familiarization training during his induction or in the refreshers

From the above it is clear that he has overacted beyond the limit and role of ACM crew. Before the evacuation command he made unwanted movements towards the over-wing exit which could adversely attracted the passengers leading to the chaos in the cabin. Without coordinating with CCIC he opened the over-wing exit on left side, which is the main cause for the injuries to the one of the passengers. He also did not have proper training for guarding the over-wing exit and evacuation through the over-wing exit.

From the foregoing exhaustive analysis, it is clear that the ACMs 35B,35C and 28D overacted beyond the limit of the ACM duties and were not having training on over-wing exit evacuation. Before the evacuation command they made unwanted movements towards the over-wing exit which could adversely attracted the passengers leading to the chaos in the cabin. without coordinating with CCIC they opened the over-wing exit on right and left side which is the main cause for the injuries to the passengers. Overall there is no co-ordination between the cabin crew and ACMs. ACM at 35A without having proper knowledge of anti-collision lights and its effect on the wing in a wet surface condition wrongly presumed it as fire from the engine and activated the ACMs for overacting on the situation without co-ordination with other cabin crew and CCIC.

2.5 ATC role:

After having confirmed from CCIC the fire from the left engine when Captain enquired the tower(SMC) and asked, " we have

emergency. Do you see fire from our left engine". For which tower reported "negative. No fire from this side insight to me, sir." ATC also at the same time advised follow me jeep 3 to proceed to the Jet airways site between N6 and N7. ATC also advised CFTs to proceed to the site expeditiously for attending the aircraft.

Statement of the SMC controller, WSO and relevant ATC tape transcript also confirmed the above.

There is No ATC role being the contributory factor to the incident

2.6. Circumstances Leading to the incident:

Aircraft after successful pushback and start up, started taxiing as instructed by tower via L4 and then N taxi track. While the aircraft was abeam N7 taxi track captain received the interphone from ACM-35B that aircraft left engine was on fire. This message was given by his close friend sat on 35A and was overseen by the ACM-35B. ACM-35A has wrongly presumed the red light(anti collision light) reflection on the left wing bottom. One of the two Anti-collision light is installed on the bottom of the fuselage. Other is on the top of fuselage. After confirming thrice from the ACM-35B, aircraft was stopped abeam N7 taxi track. Captain called tower for confirming the fire from left engine. Tower replied that negative and did not see any fire from their side. Mean time captain also asked CCIC to confirm the fire through the window as he did not have any indications for the fire, in the cockpit. CCIC also confirmed after checking through the window at 36A and confirmed the fire under the left wing. She also already got the overacted message from other ACM 35C-her husband about the fire from the engine. Captain after discussed with the first officer declared precautionary evacuation and advised the CCIC for evacuation from right side doors and told her to decide. Mean time ACM 35B and 35C made unwanted movement in a hurried manner towards the right side over-wing exit. Also the other ACM 28D seeing the situation in the cabin and after talked to the CCIC who was passing him and with the ACM 35C going to right over wing, went exit to the left over-wing exit for evacuation purpose. These 3 ACMs moved towards the over-wing prior to the evacuation

command from the captain on PA. CCIC also passed the evacuation instruction to the L2 crew for right side evacuation. Seeing the unwanted movements of the crew and ACM passengers became panicky of the situation. Aircraft after reporting to tower their emergency due reported fire from left engine declared that they are evacuating. After carrying out the shut down and evacuation checklist captain announced the cabin for evacuation. Immediately passengers started rushing towards aft and front especially towards the over-wing exit. In the chaos the L2 door slide also deployed apart from R1 and R2 doors slide. Both Right side over-wing exits and rear left over wing exit also opened for evacuation. CCIC did not control the cabin for orderly evacuation. Mean time tower informed Follow Me jeeps, CFTS and rescue services to proceed to the site of evacuation. During the chaos of situation in the cabin some of the passengers jumped out of the L2 door and left over-wing exit also. Passengers also jumped through the right over-wing exit without any control. Some of the passengers had fallen one over the other who exited through the right over-wing exits. Some of the passengers were jumping as well sliding out during the evacuation with their shoes and luggage. In the process of chaotic evacuation 25 passengers were injured. Out of which 13 were treated at MI room of the airport and 12 were referred to the nearby hospital. Out of the injured passengers 4 of them were seriously injured due multiple fractures. The incident took place at about 1525 UTC in the dark night and the taxi track surface was wet.

3. C O N C L U S I O N S :

3.1 F I N D I N G S :

- a) Aircraft had a valid C of A and valid Certificate of Release to Service (CRS) on the day of incident.
- b) Both pilots were appropriately licensed and qualified to undertake the flight. They were also medically fit and given adequate rest prior to operating the flight.
- c) Commander had total flying experience of 8400 hrs on B-737NG and as P1 3500 hrs and as P2 4900 hrs. First officer had total flying experience of 2475 hrs out of which 2100 hrs on type.

- d) Pilots were not under the influence of alcohol.
- e) At the time of taxiing taxi track "N" was wet due drizzling in the previous hours. There was no rain at the time of incident. Weather is not a contributory factor to the incident.
- f) There was neither smoke nor fire from/on the LH engine or below LH wing as reported by the cabin crew and ACM cabin crew. There was neither smoke nor burning smell inside the aircraft.
- g) It is the illusionary situation due to the red light emanated from the anti collision light at the bottom of the fuselage in line with wing, which reflected on the bottom of the wing with quick intermittency.
- h) Serviceability/ maintenance of the aircraft is not a factor to the incident.
- i) There was no actual fire from the engine or from the wing side. This was confirmed by the captain from the cockpit indications. He also physically checked peeping through his side window and no fire was seen. Tower also confirmed him no fire.
- j) Captain completely relied on the illusionary information passed by the overacted ACM at 35B which was wrongly ascertained by the CCIC who was already under the wrong illusionary information of fire from another ACM-CCIC, happened to be her husband.
- k) Captain failed to judge the situation and ordered for precautionary evacuation which itself shows that he is not aware of the situation. Normally evacuation is done only for emergency. In the above non-emergency situation the captain could have returned back to the bay on single engine for normal de-planning of passengers.
- l) Lack of the situational awareness, captain made wrong decision of carrying out evacuation. First officer also failed to play her role in suggesting returning back to bay on single engine for normal deplaning of passengers as there was no real emergency.
- m) During cabin crew SEP training crew were trained for emergency evacuation for fire depending on external situational assessment. however they were not trained to recognize fire from the engine.

- n) Cabin crew were not taught for identifying the locations and the importance of certain navigational and anti- collision lights during their training.
- o) CCIC did not instruct to open the rear door L2 or instructed the L2 crew to open L2 door to check for the confirmation of fire from left engine or below the wing. Rather she fully relied on the information from the other ACM(her husband) and ACM at 35B and registered the same information in her mind prior to checking by leaning through the window of 35A.
- p) From the location of 36A the engine cannot be seen and hence it is not possible to confirm the fire.
- q) CCIC also failed to have the control on ACM cabin crew members and allowed them to overact on the situation leading to the chaos in the cabin.
- r) CCIC and other crew members including ACMs were not having the basic awareness of the external lights especially the anti-collision lights of the aircraft.
- s) CCIC did not ensure proper preparation of the cabin for evacuation and also failed to give proper instruction for orderly evacuation. This had led to the opening of L2 slide and the opening of right side both over-wing exits and left side rear over-wing exit. Passengers injured were mostly those who exited through over-wing exit.
- t) Overall CCIC failed to justify her role as CCIC in the incident flight.
- u) L2 crew failed to inform neither the cockpit nor the CCIC having not confirmed the fire from the left side when she checked from 36th row. The guarding procedure followed by her during evacuation for L2 were not correct.
- v) L2 side door might have been opened in the chaos by the L2 crew to avoid worsening of the chaos in the cabin and some of the passengers jumped through the L2 slide.
- w) During the induction training of the cabin crew they have been taught in the classroom that on the basis of request from the operating crew, assistance will be provided by the ACM crew. However it had not been documented in the company policies/procedure which includes cabin crew training manual.

- x) After the completion of hectic day drill of ditching and fire drill ACM 35A might have got the illusion of fire after noticing the reflection of anti-collision light (RED light) on the bottom of the wing. She has not been taught for identifying the locations and the importance of certain navigational and anti-collision lights. She is also not trained to recognize fire from the engine. From her position she could not see the engine. Hence it is safely concluded that she wrongly presumed the reflection of red light (anti-collision light) on the bottom of the wing as fire from the left engine and activated her close friend and ACM at 35A who in turn overacted the situation and informed the captain.

- y) It is clear that the ACMS 35B,35C and 28D overacted beyond the limit of the ACM duties and were not having training on over-wing exit evacuation. Before the evacuation command they made unwanted movements towards the over-wing exit which could have adversely attracted the passengers leading to the chaos in the cabin. Without coordinating with CCIC they opened the over-wing exit on right and left side which is the main cause for the injuries to the passengers.

- z) Overall there is no coordination between the cabin crew and ACMS. ACM at 35A without having proper knowledge of anti-collision lights and its effect on the wing on a wet surface condition wrongly presumed it as fire from the engine and activated the ACMS for overacting on the situation without coordination with other cabin crew and CCIC.

- aa) Other crew members also failed to ensure the orderly and injury free evacuation.

- bb) There is No ATC role being the contributory factor to the incident.

- cc) Airport fire services and search and rescue team had been deployed appropriately to ensure the evacuated passengers shifted to the safe place and proper first aid was given to injured passengers.

- dd) There was serious injuries to 4 passengers and minor injuries to 21 passengers.

3.2. C A U S E (S)

Wrong decision of the captain to carry out evacuation for non-real emergency situation of imaginative fire from the left engine, leading to the serious injuries to passengers is the most probable cause for the incident.

Contributory factors:

1. Non-awareness of the effect of anti-collision light by the ACMs, cabin crew and CCIC
2. Over reacted ACMs and absence of company policy on ACM role in the flight
3. Failure of CCIC to play her role in evacuation
4. Incorrect usage of non-required exit for evacuation
5. Lack of training on over-wing exit evacuation
6. Wrong door guarding procedure
7. Lack of situational awareness and crew coordination of the cockpit crew.

4. S A F E T Y R E C O M E N D A T I O N S :

- (a) Appropriate action should be taken on involved cockpit crew, ACMs, cabin crew for their lapses.
- (b) SEP training of the crew should be reviewed based on the findings and contributory factors.
- (c) Evacuation procedures should be reviewed based on various emergency situations.
- (d) Appropriate action as deemed fit may be taken on the other findings.



Date: 26.10.2010
Place: Mumbai

(C.P.M.P. RAJU)
Enquiry officer: VT-JGM