



SI 01/17



Date : 8 April 2017  
Type : Boeing B737-800  
Registration : 9M-MXX  
Operator : Malaysia Airlines Berhad  
Fatality : 0  
Nature : Runway Excursion  
Location : Sibiu Airport, Sarawak

## **SUMMARY**

On 08 April 2017, at 2217 LT, a Malaysia Airlines Berhad (MAB) Boeing B737-800 bearing registration 9M-MXX was performing a scheduled flight MH2718 from Kuala Lumpur (KUL) to Sibiu (SBW), Sarawak, with 63 passengers and 6 crew. MH2718 experienced a runway excursion upon landing on Runway 13 at Sibiu Airport in heavy rain.

The aircraft veered to the right of Runway 13 and travelled approximately 480 m on the soft ground parallel to the runway before coming to a stop diagonally towards the runway edge. The nose gear collapsed just before the aircraft came to a complete stop.

All passengers and crew were safely evacuated from the aircraft using the two (2) forward slides. No injuries were reported during the whole serious incident. The aircraft sustained damages to the nose gear assembly and also the lower fuselage aft of the nose gear, while areas around the flaps, engine cowling and fan bypass areas sustained minor damages as a result of the runway excursion.

Investigators from BSKU were sent to Sibiu on 9 April 2017 and investigation started on the same day. MAB also conducted an independent investigation alongside BSKU. The investigation was led by Investigation-in-Charge (IIC), Brigadier General Dato<sup>™</sup> Lau Ing Hiong RMAF. The investigation was assisted by two MAB investigators as experts on the aircraft type.

The investigation team arrived in Sibiu on 09 April 2017 and proceeded with the investigation on site. Interviews were conducted with the related personnel. The Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) were removed from the aircraft. On 18 April 2017, both FDR and CVR were brought to AAIB Singapore by two officers (one each from BSKU and MAB) for their analysis.

The investigation revealed a number of factors that have caused and contributed towards the incident that occurred during the night hours. Sudden increase in rain intensity at the Sibiu Airport, i.e. from moderate to heavy at below 100 ft above ground level (AGL) had caused the flight crew to have reduced visibility of visual references and runway lightings. There was no centerline light available on Runway 13/31 Sibiu. The Pilot Flying (PF) was informed of the crosswind component from the right during the final approach by the Pilot Monitoring (PM). The wind velocity had however reduced to less than 2 knots from the initial 6 knots as the aircraft was approaching the runway. The PF nevertheless applied crosswind technique for the landing by oscillating the control wheel to the right, consistent with the „perceived“ right crosswind. This had introduced a heading drift of 40 to the right that resulted in a heading of 1330. In actual fact, the runway heading is 1290. The aircraft touched down at approximately 10 m to the right of centerline with 60 of bank angle. There



SI 01/17



was minimal rudder input to regain the runway centerline track. The aircraft left the runway surface at 720 m from Threshold Runway 13, approximately three seconds after the aircraft had initially contacted the runway.

Recommendations will be forwarded to MAB with reference to the corrective actions that are required. These shall include providing remedial training to the flight crew that were involved, enforcement of threat and error management (TEM) principals in relation to flight activities, improvement on the standard callouts that would be used during the landing phase, and other crew resource management (CRM) related training.

The crew have completed the required training and assessment. They have been released for line operation.

The aircraft that was involved in the incident has been repaired and was returned to service on 22 November 2017.

### **CAUSAL FACTORS**

1. A sudden increase in the intensity of rain while approaching the runway at night resulted in the significant reduction of the PF's visual reference. Under these conditions and without the runway centerline lights, the PF did not detect the lateral movement of the aircraft in time to correct the displacement from the runway centerline.
2. Pilot induced oscillation resulting in the progressive input of roll angle to the right of up to 6 degrees during flare maneuver without any considerable left rudder input. This resulted in a drift in the aircraft heading towards the right side of the runway. The resultant drift angle recorded on touchdown was 4 degrees (Runway heading is 129o while the touch down heading was 133o).
3. The PF had likely lost his positional awareness with reference to the runway edge due to the degraded visibility, hence, did not exert sufficient and timely rudder application to regain the runway centerline before departing the surface of the runway.

### **SAFETY RECOMMENDATIONS**

#### **DCA is to ensure MAB**

1. To ensure flight crew that were involved are coached:
  - 1.1 In the use their best judgment, knowledge and experience in identifying and managing potential risks relating to takeoff, approach and landing in heavy rain and thunderstorm.
  - 1.2 On the proper execution of crosswind landing technique, in accordance with the procedures outlined in the Boeing B737-800 FCTM including go-around and wave-off practices both in manual and autopilot mode as applicable.
  - 1.3 To understand the difference between the execution of an automated and the manual go-around in terms of availability of the auto throttle function to assist the management of



SI 01/17



thrust. In this respect, flight crew's overreliance of automation should be addressed accordingly.

1.4 To emphasize the FCTM recommendation relevant to flare maneuver and landing roll procedures as follows:

1.4.1 Fly the nose wheels smoothly onto the runway without delay.

1.4.2 Not to attempt to hold nose wheels off the runway. Holding the nose up after touchdown for aerodynamic braking is not an effective braking technique and results in high nose gear sink rates upon brake application..

1.4.3 To avoid the risk of a tail strike, do not allow the pitch attitude to increase after touchdown.

1.5 In CRM with specific emphasis on the effective employment of TEM principals during pre-departure and arrival briefings. Elements relating to situational awareness, critical thinking, decision making and communication should be included in the training program. The communication module should highlight the need to be assertive and to voice out clearly of any developing or impending safety deficiencies that require immediate action by the PF.

2. Use of the RVR as a measure of visibility during heavy rain or thunderstorm should be carefully evaluated. By comparison to static precipitation such as mist, fog or smog, lower RVR reading in moderate rain, heavy rain or thunderstorm more often indicates potential risks of encountering wind shear, microburst, turbulence, or slippery and contaminated runway. Therefore, flight crew should exercise extreme caution when operating in the reduced RVR even though the RVR reading is above the minimum published for the approach type.

3. MAB is to examine the need to provide guidance material to all flight crew with regards to the appropriate use of the RVR during takeoff and approaches in heavy rain and thunderstorm, particularly in airports that do not have runway centerline lights. Information that is provided should include guidance or direction to the pilots regarding the lowest usable RVR reading relative to the charted (LIDO) RVR/CMV.

4. The importance of the TEM briefing should be further emphasized to ensure that all flight crew conduct thorough evaluation of the potential risks and hazards that are associated with the current flight. Having identified the applicable risks, flight crew should discuss their expectations and develop a shared mental model of the situation at hand, including any required mitigation to properly and proactively address the threats that are identified. Reference should be made to MAB OM (A).

5. Similar CRM training as per reference in MAB OM (A) should be extended fleet-wide during flight crew competency checks, as well as during the Command Development Course, simulator training and Initial Operating Experience (IOE).

6. Having an enhanced knowledge of the local weather phenomenon would be beneficial in ensuring the safe aircraft operation in the dynamic and often challenging meteorological conditions. MAB is to identify and provide information to flight crew with regards to local



## SI 01/17



weather phenomenon and other potential risks that are specific to selected airports through the MAB OM (C) or other suitable means.

7. Flight crew training program should be expanded to include decision and execution of go-around maneuvers below the MDA or close to the runway that are potentially caused by:

7.1 Loss of sufficient visual reference.

7.2 Aircraft is no longer assured of landing within the confines of the runway.

7.3 Runway becomes unusable due to presence of obstacles or other foreign objects.

7.4 Loss of required runway lightings.

7.5 Unstable approaches.

7.6 Any other reasons that are deemed necessary.

8. This recommendation is to be used in conjunction with MAB OM (A) which states that the landing may be completed provided that the required visual reference is established at the MDA/H and is maintained until landing.

9. To ensure clarity, MAB is to consider including in OM (A) on the requirement to perform a go-around in the event that visual reference becomes insufficient (or other reasons as stipulated above) following decision to continue approach below the MDA/H during precision and non-precision approaches.

10. Standard callouts are designed to alert the other pilot of any deviations from normal parameters should be short and precise. This is to address the issue immediately, without creating any doubts or uncertainty to the person executing the corrective action. It is especially true when the situation warrants immediate corrective action.

11. Similar to deviation from localizer track which is alerted by the call “localizer” without stating the direction of deviation, the drift from runway centerline should be highlighted with a single word “centerline” to save time and avoid ambiguity. MAB is to ensure the inclusion of standard callout intended to highlight identified deviations from the required lateral trajectory during flare and landing maneuvers.

12. MAB is to cascade to all flight crew highlighting the runway excursion incident and the lessons learned for the benefit of all pilots and the organization.

13. MAB is to ensure that all cabin crew are briefed on the requirement to deploy all escape slides for the evacuation on the ground, regardless of the number of passengers or their seating locations in the cabin. This is in accordance with the established SEP.

### **DCA to ensure MAHB**

1. To comply with the ICAO Annex 13 Part 3.4 requirement on preservation of evidence with regards to repair and replacement of the damaged runway edge light.



## SI 01/17



2. To collaborate with all relevant agencies within the airport in order to facilitate the effective post evacuation procedures, which includes transportation for all passengers and crew that are involved in the incident or accident. There should be a concerted effort by all agencies to ensure the expeditious handling of the situation in the interest of safety and wellbeing of the persons that are involved.

### 3. DCA Sibul

3.1 The ATC controller should provide information on changes in weather conditions as they occur, either by updating ATIS information or through radio communication. This is to enable pilots to evaluate the situation and make necessary preparation for landing, hold or divert to a more suitable airport.

3.2 The weather information in ATIS should be updated on a more frequent basis, i.e every half hour instead of hourly. Any SPECI information that is issued by the meteorological department must be transmitted to the pilot via ATIS and/or by the ATC controller as a broadcast message.

3.3 ATC controllers are to refrain from using non-standard phraseology in providing weather information.

### 4. DCAM

4.1 To examine the need to establish an agreement or understanding between the Ministry of Transport and Ministry of Health to facilitate the drug, alcohol, blood and other necessary tests by either hospitals or medical facilities, if such request is made by air operator's officials following an air incident or accident.

4.2 To consider installation of the runway centerline lights at Sibul Airport and other airports that are frequently exposed to risk of adverse weather conditions.