

1. **AIRCRAFT INFORMATION:**

Aircraft Owner : MG Kinabalu Leasing Limited, Ireland
Aircraft Operator : MASwings Sdn. Bhd
Air Operator Certificate Number : 38
Air Operator Certificate Expiry Date : 30 September 2016
Aircraft Type : DHC6-400 Twin Otter
Aircraft Serial Number : 894
Aircraft Registration : 9M-SSE
Nationality : Malaysian
Flight Number : MH3525
Flight Sector : Lawas (LWY) – Miri (MYM)
Type Of Flight : Scheduled Passenger
Total Hours : 1812
Total Cycles : 2615

2. **SUBJECT:**

Inadvertent Opening of the Passenger Door In Flight Dated 10 July 2015.

3. **INTRODUCTION:**

- 3.1 During flight MH3525 from Lawas to Miri, severe turbulence was encountered. Whilst inside the weather, the Red Master Warning associated 'door unlocked' message on the Crew Alerting System (CAS). Emergency checklist was carried out and the passengers seated next to the door were relocated. The door remained closed at that time. However, on final approach, when the flaps were set to 10 degrees, a loud sound was heard from the cabin and the door was found fully opened. Aircraft landing was uneventfully. There were no damages to the aircraft and there were also no injuries to either passengers nor crew.

4. **PERSONNEL CONTACTED:**

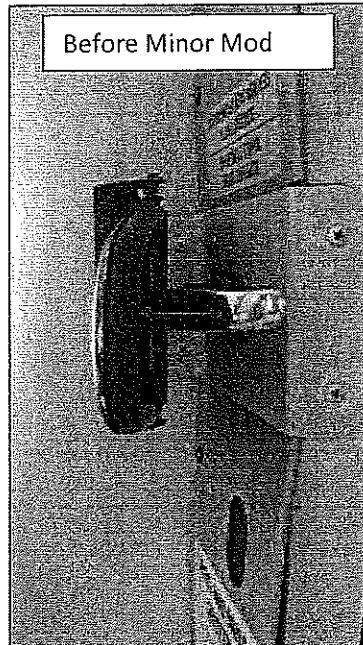
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|-----|------------------------------|--------------------------------------|
| 4.1 | Elex Kiong | Licensed Aircraft Engineer (MAS E&M) |
| 4.2 | David Cammarance Samuel Labo | Security Officer (MW) |
| 4.3 | Capt. Gobunath Arikrisnan | DHC6-400 Pilot (MW) |
| 4.4 | Capt. Syaharuan Keman | Flight Safety Manager (MW) |

5. **FINDINGS:**

- 5.1 The closing of the door whilst the aircraft was on transit at Lawas was performed by MASwings appointed ground handler, Green Valley Sdn. Bhd. The staff who was on duty to perform the task was En. Jospser.

- 5.2 In view of the DHC6-400 Twin Otter operation was into a non-Engineering manned Short Take Off and Landing (STOL) port, the operating pilots are required to ensure that the doors are positively closed and secured, prior departure. This was duly done as required for flight MH3525 on the 10th of July 2015.
- 5.3 The DHC6-400 Twin Otter door indication in the cockpit are associated to the following doors :
 1. Forward Cargo Door
 2. Aft Cargo Door
 3. Passenger Air Stair Door
 4. Right Hand Service Door
- 5.4 In the event of an unlocked door whilst the aircraft is on ground, the message annunciated will be an amber caution message on the CAS. However, when the aircraft is in air mode, the same situation would be indicated as a red warning message. Air mode is triggered when the aircraft is above 35 knots.
- 5.5 Further to the electrical door indication, inspection windows are also provided on both the inside and outside of the passenger air-stair door and on the RH service door. The door's security can be verified by means of the "witness marks" on the internal latch mechanisms.
- 5.6 The passenger air-stair door locking mechanism is configured for an 'over centered' arrangement, coupled with the action of a spring tension. As such, extra force will be required to move the door handle out of it's full 'close' position.
- 5.7 A flapper guard is installed over the door handle to prevent the inadvertent opening of the passenger air-stair door.
- 5.8 Following the landing of MH3525 on the 10th of July 2015 into MYY, the door locking mechanisms were inspected and they were found in normal condition. The door's locking system was found satisfactory. The door indication system was also found satisfactory. A general inspection was also performed on the passenger air-stair structure and no anomalies were observed. The aircraft was then released into service with no further incident.
- 5.9 Following a fact finding effort between MASwings Airport Operation, Security Department and the operating crew, it was confirmed that the LH rear most seat was occupied by a passenger and it was later established that he had inadvertently moved the door handle to the 'open' position when his leg came into contact with the internal door handle.
- 5.10 This LH aft seat is considered to be in close proximity to the passenger air-stair door . A flapper guard is provided over the door handle to prevent the inadvertent actuation of the door handle which would result in the door being opened.
- 5.11 Upon further inspection, the flapper guard assembly was found to be 'lifting' occasionally, hence resulting in the passenger's knee being able to pass through the gap between the door structure and the flapper guard assembly and eventually coming into contact with the door handle.
- 5.12 The inherent design deficiency was highlighted to Viking Canada following which a minor modification on the flapper guard assembly was introduced through Viking instruction HQ-98297 which has been duly accomplished on all 6 of MASwings' DHC6-400 Twin Otters, bearing registration 9M-SSA thru 9M-SSF.

- 5.13 The above mentioned minor modification, has improved the tension of the springs on the flapper guard assembly, resulting in the guard to be positively covering the door handle. This has reduced the possibility of any inadvertent actuation of the door handle as reflected in the attached images below.



- 5.14 Viking Canada had also indicated of an impending re-design to the door handle guard assembly which would result in an assembly part number change.
- 5.15 The DHC6-400 Twin Otters operate with no cabin crew on board. The monitoring of passenger activities and verification of any anomalies in the aircraft cabin is at bare minimum or not available at all.

6. CONCLUSION:

- 6.1 The opening of the door was a result of the inadequate spring tension on the door guard to positively cover the door handle from inadvertent operation.
- 6.2 The deficiency had been corrected as per the recommendation by Viking Canada as the OEM for DHC6-400 Twin Otters..

7. RECOMMENDATION:

- 7.1 Viking Canada had indicated a new design of the guard assembly. The retrofit of the new guard assembly is to be adopted as soon as it is made available.

Action : Head of Technical and Planning (EMD-MAB)

- 7.2 The passenger briefing prior flight should include highlights of potential hazards and safety

concerns in relation to the door operation

Action : Flight Safety Manager