

## Lau Ing Hiong

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**From:** Aaron Dominic Anthony <aaron.anthony@malaysiaairlines.com>  
**Sent:** 20 Mac 2017 9:20  
**To:** Lau Ing Hiong  
**Cc:** Yahaya Bin Abdul Rahman, Kapt Dato'  
**Subject:** FW: MW/MOR/DHC/0216 SSB Skid off runway  
**Attachments:** MW MOR 0216 SSB 27Aug2016.pdf; NLG \_ DHC6 \_ Investigation Report SN\_H1215.pdf

Sir,

Pls find attached SSB investigation report following the event dated 27 AUG 2016.

Brgds / Aaron

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**From:** Yeow Soon Lee  
**Sent:** Thursday, March 16, 2017 3:03 PM  
**To:** Aaron Dominic Anthony <aaron.anthony@malaysiaairlines.com>; safety.mor@dca.gov.my  
**Cc:** Amirudean Zid <amirudean.zid@malaysiaairlines.com>; Ahmad Ezanee Omar <ahmadezanee.omar@malaysiaairlines.com>; Abdul Latif Koyakunhi <abdullatif.koyakunhi@malaysiaairlines.com>; Goh Chin Seong <chinseong.goh@malaysiaairlines.com>; Adam Abdul Manaf <adam.abdulmanaf@malaysiaairlines.com>; Ahmad Mukhlis Kamarul Bahrin <mukhlis.kbahrin@malaysiaairlines.com>; Al Azim P Jamal Mydin <alazim.pjamalmydin@malaysiaairlines.com>; Burhan Ismail Haitami <burhan.ismailhaitami@malaysiaairlines.com>; Canisius Loo <canisius.loo@malaysiaairlines.com>; Hamdan Fuad <hamdan.fuad@malaysiaairlines.com>; Jerome Pereira Saturninus Pereira <jerome.pereira@malaysiaairlines.com>; Lam Hon Kee <honkee.lam@malaysiaairlines.com>; Lee Ah Teck <ahteck.lee@malaysiaairlines.com>; Ong Jyh Rong <jyhrong.ong@malaysiaairlines.com>; Paul Ong Chong Sun <paul.ong@malaysiaairlines.com>; Peter Lim <peter.lim@malaysiaairlines.com>; Redwan Shamsuddin <redwan.shamsuddin@malaysiaairlines.com>; Syamsul Bahri Omar <syamsulbahri.omar@malaysiaairlines.com>; Zulkefle Muhammad <zulkefle.muhammad@malaysiaairlines.com>; Chong Yun Hoh @ Desmond <desmond.chong@malaysiaairlines.com>  
**Subject:** MW/MOR/DHC/0216 SSB Skid off runway

Dear Sir,

DIR DHC6-02.17 for MW/MOR/DHC/0216.

Thank you  
Yeow Soon Lee  
MQA (Safety)

\*\*\*\*\*

### DEFECT/INCIDENT INVESTIGATION REPORT (DIR)

\*\*\*\*\*

TO	:	QAM (Safety)	DIR REF	:	
CC	:	DCA, HQA, QAM (Coordinator), QAM (Compliance), QAM (MW), HOE (MW)	ASR REF	:	Nil
			OR REF	:	MW//MOR/DHC/0216

\*\*\*\*\*

ACFT TYPE	:	Viking DHC6-400	ACFT REGN	:	9M-SSB
FLT NO	:	MH3568	SECTOR	:	MYM-MUR
DATE	:	27 Aug 2016	MR1 NO	:	61300801
ATA	:	32	STATUS	:	Closed

DESCRIPTION : Steering actuator PART NO : 71-200-15  
 SERIAL NO : H1223 TSF : 2258  
 POSITION : Nose CSF : 2258

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NOTE : (STRICTLY CONFIDENTIAL AND FOR INTERNAL CIRCULATION ONLY) ACTION PARTIES TO  
 RECOMMENDATIONS – PLEASE PROVIDE RESPONSE WITHIN 14 DAYS FROM DATE OF ISSUE

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1. TYPE OF INCIDENT

1.1 Aircraft Skidded Off Runway During Landing

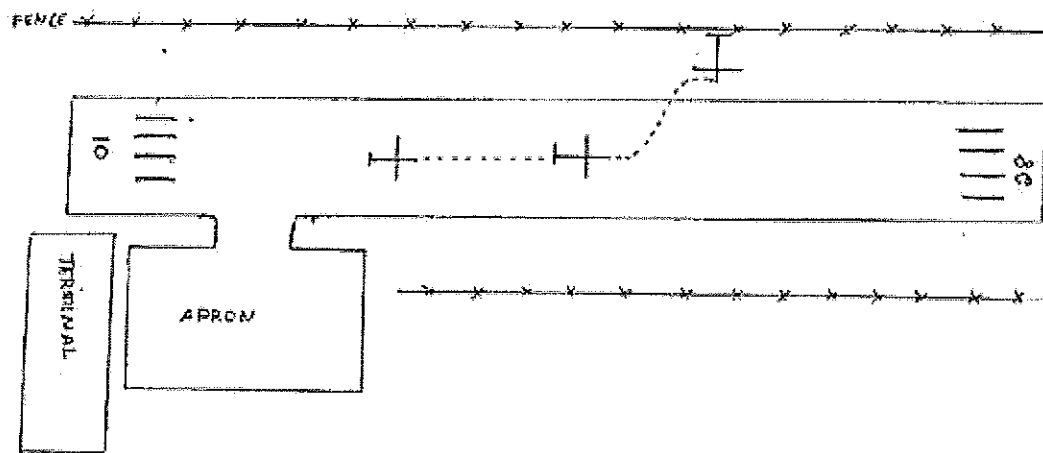
2. DESCRIPTION OF INCIDENT

2.1 MASwings Viking DHC6-400 Twin Otter aircraft operated MH 3568 from Miri Airport (MYA) to Marudi Airport (MUR) on 27<sup>th</sup> August 2016.

2.2 The aircraft was stable with both main wheel on touch down at runway 10, however as the nose wheel contacted the runway surface, the aircraft veered to the left uncontrollably.

2.3 The crew applied the right rudder and brake but unable to stop the aircraft movement. Shortly after that, the crew tried to maneuver the aircraft by giving input to the steering and it was unsuccessful to steer the aircraft.

2.4 The aircraft came to a complete stop on the unpaved field at the left side of the runway. Please refer to the illustration below. The engines were shut down as per normal procedure. The crew and a total of 04 passenger were uninjured.



3. MAINTENANCE ACTION

3.1 The aircraft was subsequently towed to apron after engineering personnel was satisfied following a preliminary inspection carried out on the aircraft. At the apron, a detailed visual inspection was initiated.

3.2 The nose and main landing gear and its associated assemblies were found satisfactory.

3.3 The nose and main wheel assembly were also found satisfactory. All the wheels were checked for free of rotation and there were nil brake binding being observed on the main wheels.

- 3.4 The hydraulic system was operated and pressurized for approximately 01 hour to check for un-commanded movement of the nose wheel steering actuator. Nil leak was found on the nose wheel steering actuator and there were nil abnormalities observed.
- 3.5 The aircraft fuselage, engines and propellers did not suffer any damages.
- 3.6 The nose wheel steering cable tension was inspected and it was found within AMM 32-50-00 limits.
- 3.7 The aircraft was released to operate a ferry flight (MH5191) on 29<sup>th</sup> Aug 2016 to return to MYY following the inspections carried out in Para 3.2 to 3.5.
- 3.8 The nose landing gear strut (P/N: 71-300-33, S/N: H1215) and steering actuator (P/N: 71-200-15, S/N: H1223) were replaced as a precautionary measure prior to release the aircraft to service. Reference MR 61300808, 61300809 and 61300810.
- 3.9 The onboard Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) were removed from the aircraft for data acquisition and analysis. The FDR data were reviewed by MASwings Flight Safety department and there were nil abnormalities found. The CVR data were unavailable as it was deleted inadvertently.

4. **INVESTIGATION / FINDINGS**

- 4.1 The Nose landing gear assembly and steering actuator were sent to Heroux Devtek in Canada for investigation.
- 4.2 The strip report obtained has demonstrated that there were nil significant failure on the nose landing gear nor steering actuator which could have led to this incident. Please refer below for the strip report content.



**Investigation:**

- 1) In order to reproduce the customer 's complaint declaration, the Steering Actuator (71-200) and Shock Strut Assy (71-300) were reassembled together to build the NLG's (71-100) highest configuration. The NLG (71-100) was then tested per QCP 71-4 -8 to verify if any deviation of the Fork Assy would occur without actuating the hydraulic valve. Applied a running pressure of 1500 psi per QCP 71-4 -8, no irregularity was noted on NLG assy (71-100).

5. **CONCLUSION**

- 5.1 Based on the information and data gathered, it was unable to conclude the root cause of the incident.

6. **RECOMMENDATION**

- 6.1 Nil.

\*\*\*\*\*

RAISED BY : Desmond Chong  
 DATE : 07 Mar 2017

APPROVED BY : Yeow Soon Lee  
DATE : 16 March 2017

\*\*\*\*\*

**RELEASE UNDER THE AUTHORITY OF THE HEAD QUALITY ASSURANCE**

\*\*\*\*\*

FORM NO: 307007 R11 10/2012 / Email

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Malaysia Airlines Berhad

We are Professional, Progressive, Connected and Open  
Malaysia Airlines Berhad

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## Investigation Report

DHC-6 Steering Actuator (71-200-15)	S/N : H1223	HDI Release Note : 17137 Ship date : April 2014
DHC-6 NLG Shock Strut Assy (71-300-33):	S/N: H1215	HDI Release Note : 16351 Ship date : February 2016

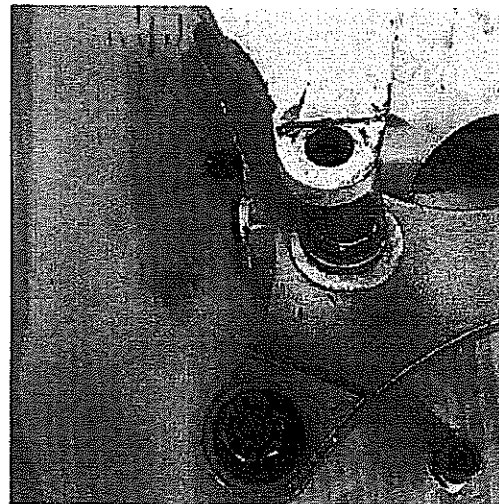
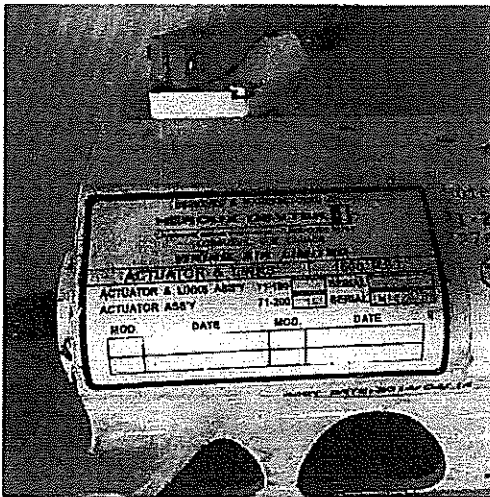
- Steering Actuator (71-200-15), S/N: H1223 shipped to Viking as a SPARE PART.
- NLG Shock Strut Assy (71-300-33): S/N: H1215 shipped to Viking as a SPARE PART
- Both Parts were received in Longueuil on October 16<sup>th</sup>, 2016 as warranties.

### Customer Complaint

NLG Strut was involved in a steering runway departure with Steering S/N:H1223

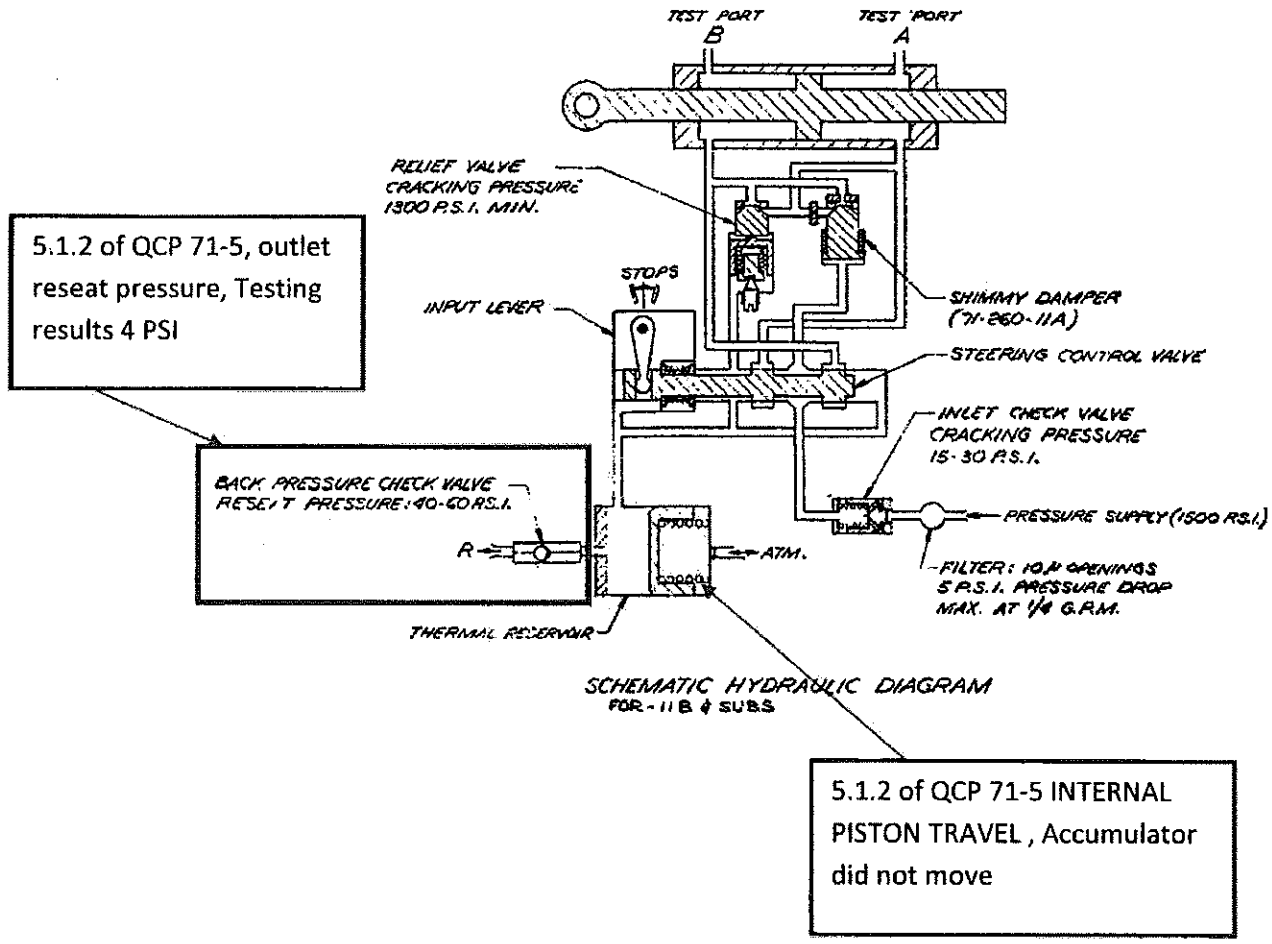
### Inspection and evaluation

- a) Upon complaint reception, all original quality records related to unit Steering Actuator (71-200-15) and NLG shock strut 71-300-33 were verified and no irregularities were found.
- b) Visual inspection was performed to report and document any discrepancies on the unit, many defects were observed such as damage, scratches, nicks and gouges, pictures are available upon customer's request.



**Investigation:**

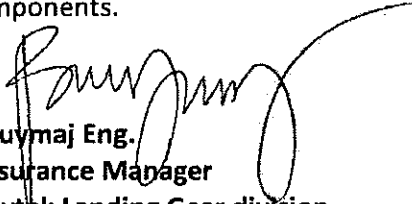
- 1) In order to reproduce the customer 's complaint declaration, the Steering Actuator (71-200) and Shock Strut Assy (71-300) were reassembled together to build the NLG's (71-100) highest configuration. The NLG (71-100) was then tested per QCP 71-4 -8 to verify if any deviation of the Fork Assy would occur without actuating the hydraulic valve. Applied a running pressure of 1500 psi per QCP 71-4 -8, **no irregularity was noted** on NLG assy (71-100).
- 2) Steering Actuator was then disassembled from top assy, and tested per QCP-71-5 (Steering alone), ATP was operated on Steering Actuator Assy (71-200) H1223 as follow:
  - Conducted test of 5.1.2 of QCP 71-5, outlet reseal pressure: pressure requirements per QCP 71-5 is 40/60 PSI, the testing results recorded was 4 PSI. Therefore, reseating pressure **failed the ATP**. This will lightly affect functionality of the unit. Considering that it is controlled by a small spring in the check valve at the return port. Having the reseal pressure closing at a lower value would implicate that hydraulic fluid would always flow through the valves directly to the return port.



- 3) Conducted test of 5.1.2 of QCP 71-5 internal piston travel; The Accumulator **did not move** during testing due to the low pressure ( 4psi). The pressure build up was not achieved to allow the accumulator piston to travel to its minimum 1.56'' (FAIL).
- 4) Conducted 5.1.3 of QCP 71-5, leakage at pressure and return port after 3 minutes ; This test was not relevant anymore, having in mind that the Outlet Reseat Pressure failed. ATP requirement is 5 Drops/MIN (FAIL). Unit leaked way over tolerance since the Check valve did not reseat at the required pressure.
- 5) 5.2.1 / 5.2.2: relief valve, the steering failed most of the Relief Valve Tests. Adjustment of pressure at 1.2 Gal. / min is out of tolerance. The reseat and cracking pressure of relief should be min 1300psi for cracking and 1100 psi for reseat they were under tolerance. Internal leakage requirements 100cc/min. It was over tolerance by 40 c.
- 6) All other elements of ATP passed the requirements, no creeping, normal cycling, nothing abnormal during Proof Pressure testing.
- 7) NLG Shock Strut Assy (71-300-33) was not tested for leakage verification. However , visual verification has conducted and revealed the following issues:
  - Steering Collar (71-177-17) loose fit due to delamination of washer from steering.
  - Lower Torque Link seems to have been removed and reinstalled with different Cotter Pin hardware.
  - Two pivots (71-194-1) were received with warranties when only one is requested.
  - Spring back system of the Upper Link (71-105-5) should be filled with Grease MIL-PRF-22; Spring (71-175-1) cavity found no grease (dry).

**Conclusion and recommendation.**

- The top assembly NLG 71-100-35 was built by the customer using Actuator 71-200-15, S/N: H1223 and NLG shock strut 71-300-33, H1215 that were sold separately as spare units. Therefore, HDI is unable to confirm that the Gear installed on aircraft was conforming to ATP requirements, since no Quality records are available.
- HDI recommends performing a complete re-life by replacing the hardware and damaged components.



**Miloud Bouymaj Eng.**  
**Quality Assurance Manager**  
**Heroux Devtek Landing Gear division**  
**755 Thurber Longueuil, QC, Canada, J4H-3N2**





To be sent to:  
 Flight Operations Division  
 Department of Civil Aviation  
 NO 27 Persiaran Perdana  
 Level 2, Block Podium B, Percinct 4  
 62618 PUTRAJAYA

**OCCURRENCE REPORT**  
 DEPARTMENT OF CIVIL AVIATION  
 MALAYSIA

(DCA Borang 9 - OR)  
 Fax to: +603 8371 4334  
 or e-mail to  
 safety.MOR@dca.gov.my

Complete all sections where information is relevant. For multi-choice boxes, indicate which entry is appropriate.						Date received by DCA		DCA Occurrence No.		
Aircraft Type and Series DHC 6 400		Registration 9M SSB		Operator MASWINGS		Date Of Occurrence 07.8.2016		Flight Phase		Nature Of Flight
FLIGHT AND WEATHER DETAILS								PARKED <input type="checkbox"/>	PAX <input checked="" type="checkbox"/>	
								TAXIING <input type="checkbox"/>	FREIGHT <input type="checkbox"/>	
Flight No MH 8568	DAY <input checked="" type="checkbox"/> NIGHT <input type="checkbox"/>	Wind 290/04	Runway Used 10	Precipitation	Icing	Turbulence	TAKE OFF <input type="checkbox"/>	SURVEY <input type="checkbox"/>		
From MARI	TWILIGHT <input type="checkbox"/>	IAS 73	State	RAIN <input type="checkbox"/>	LIGHT <input type="checkbox"/>	LIGHT <input type="checkbox"/>	INIT CLIMB <input type="checkbox"/>	PLEASURE <input type="checkbox"/>		
To MARUDU	Time 0753	H/A/I/V/F/L	DRY <input checked="" type="checkbox"/>	SNOW <input type="checkbox"/>	MOD <input type="checkbox"/>	MOD <input type="checkbox"/>	CLIMB <input type="checkbox"/>	AGRICULTURAL <input type="checkbox"/>		
Geog. Position	Visibility 9999	OAT	WET <input type="checkbox"/>	SLEET <input type="checkbox"/>	HEAVY <input type="checkbox"/>	SEVERE <input type="checkbox"/>	CRUISE <input type="checkbox"/>	BUSINESS <input type="checkbox"/>		
		30	ICE <input type="checkbox"/>	HAIL <input type="checkbox"/>		EXTREME <input type="checkbox"/>	DESCENT <input type="checkbox"/>	CLUB/GROUP <input type="checkbox"/>		
			SNOW <input type="checkbox"/>	MOD <input type="checkbox"/>			HOLDING <input type="checkbox"/>	PRIVATE <input type="checkbox"/>		
			SLUSH <input type="checkbox"/>	HEAVY <input type="checkbox"/>			APPROACH <input type="checkbox"/>	POSITIONING <input type="checkbox"/>		
					Cloud Type NIL		LANDING <input checked="" type="checkbox"/>	FERRY <input type="checkbox"/>		
							CIRCUIT <input type="checkbox"/>	TEST <input type="checkbox"/>		
							AEROBATICS <input type="checkbox"/>	TRAINING <input type="checkbox"/>		
							HOVER <input type="checkbox"/>	PARACHUTING <input type="checkbox"/>		
								TOWING <input type="checkbox"/>		

**NARRATIVE**

APPROACH WAS NORMAL FOR RUNWAY 10 AND STABILIZED BY 800 FT. DURING LANDING, WHEN MAIN WHEELS TOUCHED DOWN AIRCRAFT WAS STILL UNDER CONTROL.

HOWEVER, WHEN NOSE WHEEL CONTACTED THE RUNWAY, AIRCRAFT VEERED SHARPLY TO THE LEFT, TOWARDS THE RUNWAY EDGE. PF (CAPTAIN) APPLIED RIGHT RUDDER AND BRAKES. DESPITE ALL INPUTS, AIRCRAFT CONTINUED TO VEER. IMMEDIATE NOSE WHEEL STEERING WAS APPLIED TO CORRECT THE SITUATION BUT AIRCRAFT DEPARTED THE PAVED SURFACE AND CAME TO A STOP PERPENDICULAR TO THE RUNWAY, ON THE GRASS.

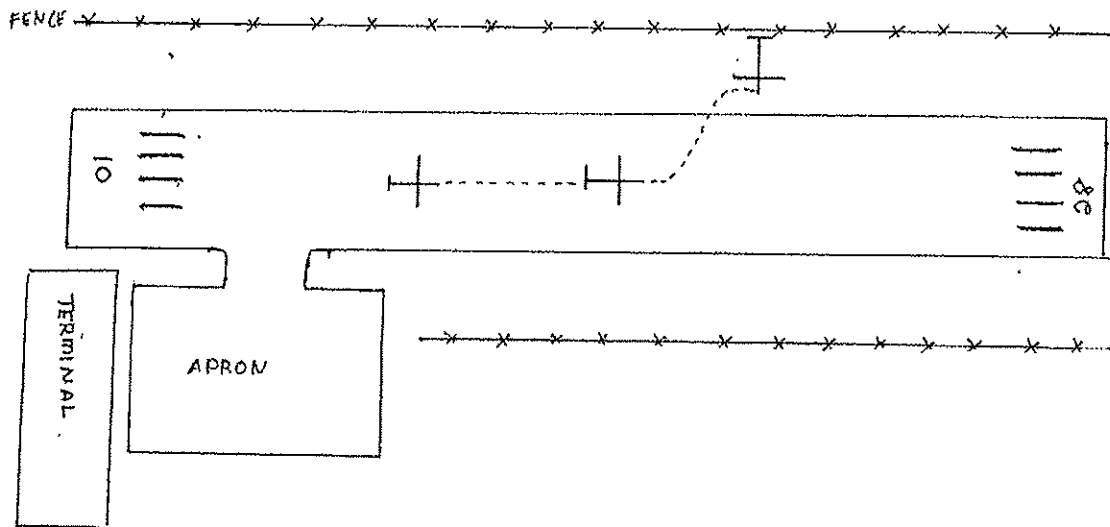
(NEXT PAGE ->)

ENGINEERING DETAILS										
	Aircraft Constructor's No		Engine Type & Series		Maintenance Organisation		Maintenance <input type="checkbox"/>			
							Ground Handling <input type="checkbox"/>			
					Tel No		Taxi <input type="checkbox"/>			
							Unattended <input type="checkbox"/>			
Component / Part	Location on aircraft		Manual Reference		Maintce Prog					
					O.C.	C.M.	H.I.			
Manufacturer	Part No		Serial No		TOTAL	Since O/M or repair	Since Inspection	Manufacturer Advised		
					HOURS					
					CYCLES			YES <input type="checkbox"/>		
					LANDINGS			NO <input type="checkbox"/>		
Is there any published Airworthiness Information or control procedures (e.g. AD, SB etc) relevant to occurrence					YES <input type="checkbox"/>	Reference No and Compliance Status of Aircraft or Equipment				
					NO <input type="checkbox"/>					

Report	If report is submitted voluntarily i.e. not subject to mandatory requirements		
ORIGINAL <input checked="" type="checkbox"/>			
SUPP <input type="checkbox"/>			
Reporter's Investigation	Can the information be disseminated in the interest of safety		
NIL <input type="checkbox"/>	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
OPEN <input type="checkbox"/>			
CLOSED <input type="checkbox"/>	Organisation		
Flight Data Record Held	MASWINGS SDN. BHD.		
YES <input type="checkbox"/>	Position	Reference No	Date
NO <input type="checkbox"/>	CAPTAIN	0216	08.8.2016
Address (if reporter wishes to be contacted privately)		Tel No	
		013 809 5987.	
		Name	
		MUHAMMAD FARIS BIN ABD. RASHID.	

NARRATIVE (if required)

AFTER AIRCRAFT CAME TO A COMPLETE STOP, NORMAL SHUTDOWN PROCEDURE WERE COMPLETED, AND PAX EVACUATED AS PER SEP. CREW ASSESSED THE PAX SITUATION AND FOUND ALL WERE FINE AND UNINJURED.



# **SAFETY INVESTIGATION REPORT**

**MASWings**

**DHC 6-400**

**9M-SSB**

**MH3553**

**MIRI TO MUKAH**

**26<sup>TH</sup> AUGUST 2015**

**OCCURRENCE NO :**

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**MASwings Safety Investigations**

**Safety Oversight by:  
Malaysia Airlines Corporate Safety Oversight**

## **1 Occurrence Details**

O3607-15, O3606-15 26<sup>th</sup> August 2015, 06:05 UTC Runway Excursion  
(9M-SSB)

## **2 Investigator**

Captain Mohd Khairul Mohamad Kamarudin, PIC Flight Safety DHC 6-400

Captain Syaharuan Keman, FOM FS(Flight Operation Manager, Flight Safety)

## **3 Department Representatives**

Captain Miron Kumer Ganguly (PIC ATR 72-500 KCH)

Captain Muhammad Fadzli Madzlan (PIC DHC 6-400)

Captain Mohd Sufri Bin Bujang (TRI DHC 6-400)

## **Report References**

Pilot Operating Handbook (POH)

Notice To Crew (NTC)

Standard Operating Procedure (SOP)

## **Synopsis**

A MASwings DHC6-400 aircraft whilst operating on flight MH 3553 from Miri Airport (MYY) to Mukah Airfield (MKM) skidded off the left side of the runway upon landing. Aircraft suffered minor damage on the nose wheel tire. Flight Operations was informed regarding the incident.

During the time of preparing this investigation, it was reported that 2 tech crew and 8 passengers were on board the aircraft and no injury were reported.

## **5 Overview of the Investigation**

The purpose of the investigation is to establish the facts of the incident, to attribute the causes, identify systemic deficiencies and to determine the learning points for the future avoidance of similar events.

## **6 Scope and Objective**

**6.1.1** The investigation report is specifically not to be used for disciplinary purposes, and is not intended to attribute blame or personal liabilities for event that took place. However, the analysis is intended to provide a full understanding of the incident, and to do so in an unbiased and objective manner.

### **6.1.2 Objective**

This approach is supportive of the company's commitment to open reporting and investigation. These are essential element of a healthy safety culture in which an organization learns from experience, improves safety and reduces risk to individuals and the company.

## **1.0 History of Flight**

On 26th August 2015, a MASwings DHC6-400 bearing registration 9M-SSB was on a routine schedule flight from Miri airport (WBGR) to Mukah Airfield. It was the first sector of the day out of scheduled 4 sectors flight duty. Flight MH3553 from Miri to Mukah skidded to the left side of runway upon landing in Mukah Airfield. Weather throughout the journey was generally cloudy and weather reported in Mukah with a wind from 080 degrees at a speed of 3 knots and moderate rain. With the aircraft in the full landing configuration and checklist completed, crew continue with the landing. During the landing roll, and after the nose wheel touches the runway, aircraft started to veer to the left side of runway. Full deflection of rudder and power differential input was applied to counter the veering. However, the action has no effect. The aircraft finally rested on the grass, on the left of the runway. After the aircraft has stopped, the crew carried out the shutdown and evacuation checklist. As observed by the airfield attendant, the aircraft main wheel tire touchdown roughly 200 meters from end of runway 26 and departed the runway centreline 150 meters after touchdown.

2 technical crew and 8 passengers were on board 9M-SSB during the incident but nil casualties nor injuries was reported. Aircraft incident was reported to Flight Operations for further instructions.

### **FROM CREW REPORT**

First sector of the day for both crew. Operating flight MH3553 Miri to Mukah. It was the commander's sector. Weather throughout the whole journey was generally cloudy. Weather information received from Mukah airfield attendant upon arrival was wind 080/03, visibility 6-8km, raining and runway wet. On descend sighted with Mukah airfield around 3000ft. On final approach with the aircraft configured for landing and checklist completed we proceed landing as per normal. On landing wind indicator on the aircraft indicated 6kts tailwind and 4kts crosswind from right. On the landing roll aircraft suddenly veer to the left of centerline. Full deflection of rudder was given by the commander to correct the veering but to no effect. Differential power was applied to put the aircraft back to its centerline and the aircraft continue to veer to the left and end up exiting the runway onto the grass area. As the aircraft stop, shutdown and evacuation checklist was carried out. Nil injuries reported by crew and passengers. Accident was reported to flight operations for further instructions.

**FROM CREW INTERVIEW**

Following the incident, the crew interview as per followed.

First sector of the day for both crew. Flight from MYY to MKM , It was the commander's sector. The aircraft had no malfunctions. Departed out of MYY around 1255 LMT. Weather through the whole journey was generally cloudy. Descend approach checklist was carried out. Weather information given from MKM.

Information upon arrival was wind 080/03, visibility 6-8km, raining and runway wet. On descend sighted the airfield at around 3000 ft on final approach with aircraft configured and checklist completed before 500ft for landing and sighted the condition of the runway was wet and there water patched we proceed to land as per normal.

On the landing roll aircraft suddenly veer to the left of the centerline, full deflection of right rudder was given by the commander to correct the veering but no effect. Differential power was applied to put the aircraft back to centerline and the aircraft continue to veer to the left and ended up exiting the runway onto the grass area. As the aircraft stop, shutdown and evacuation checklist was carried out. NIL injuries reported by crew and passengers.

**Further information from the interview**

After start, until before take off everything was normal, during take off, wind was headwind and slight cross wind and from take off until cruise, operations normal.

Approaching way point SARVO, deviated right to avoid weather. All briefing and descend approach checklist done before top of descend but still right of track due weather.

On descend, everything is normal condition and tracking 5 nm finals, RWY 26. Airfield reported moderate rain. Final approach was normal, stabilized before 500ft.

Touch down was at centerline, and once nose wheel touch the runway, aircraft veered to the left. Immediate corrective action applied initially with rudder, when full rudder applied aircraft still veered to the left, then differential power technique used with slight left forward, aircraft still not

going to the centerline, then only I realized the nose wheel tiller was deflected full left. Which was during that time aircraft was about the grass area.

After aircraft complete stop, all necessary action was taken. Pax all okay and released.

## 1.2 Injury to person/s

Nil

## 1.3 Damage to aircraft

Nil

## 1.4 Other Damage

Nil

## 1.5 Pilot Information

Pilot Information as of <u>26 Aug 2015</u>	<u>Captain</u>	<u>Co-pilot</u>
Age	44 yrs old DOB : 16 MAY 1971	24 yrs old DOB : 18 AUG 1991
Date of Operations	28 MAR 2012	28 SEP 2013
Operational Hours DHC6	1707.12	638.20
Total Flying Hours	9980:00	838:20
Rest Period	12HRS 05MIN	MORE THAN 24HRS
Last Base Check	04.05.15	05.06.15
Last Line Check	03.02.15	09.07.15
Last Instrument Rating	06.11.14	06.12.14
Hours Flown in the last 28 days	64.13	48.05



The Captain had joined the company on the 14<sup>th</sup> February 2010 as a Captain in ATR 72-500 and logged 1660:34Hours of flight experience on the fleet. After 3years with MASwings, on the 19<sup>th</sup> April 2012 he has been promoted to join Twin Otter DHC6-310 fleet. The company has brought in new Twin Otter DHC6-400 on August 2013. The Captain rated with the new Twin Otter on the 2<sup>nd</sup> October 2013 with accumulated hours of 659:37.

The Co-pilot joined the company on the 11<sup>th</sup> June 2013 as a second officer and rated in DHC6 310-fleet on the 16<sup>th</sup> November 2011. He logged 96:40 hours in DHC6-310. On the 14<sup>th</sup> June 2014, he has been upgraded to fly DHC6-400 and logged 537:00 hours. He was graduated from flying school in 04<sup>th</sup> November 2011. The 3 days CRM initial course was conducted for him on the 13<sup>th</sup> August until 15<sup>th</sup> August 2013, by Flight Safety Human Factor, MAS.

MASwings is the first airline he joined in his flying career.

## **1.6 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 : 883

Aircraft Registration : 9M-SSB

Nationality : Malaysian

Flight Number : MH3553

Flight Sector : Miri (MYY) - Mukah (MKM)

Type Of Flight : Scheduled Passenger

Total Hours : 3190

Total Cycles : 4738

### **1.6.1 Load Sheet Information**

#### Load sheet information:

Dry Operating Weight: 3615kgs

Zero Fuel Weight: 4241kgs

Take Off Fuel: 998kgs

Take Off Weight: 5239kgs

Landing Weight: 4944kgs

### **1.7 Meteorological Info**

Not relevant to this incident.

### **1.8 Aids to Navigation**

Not relevant to this incident

### **1.9 Communications**

Not relevant to this incident

### 1.10 Aerodrome Info

Airport : Mukah  
Runway : 08/26  
Length : 1097Meter  
Width : 23Meter  
ICAO Designator : WBGK  
IATA Designator : MKM  
Elevation : 0feet  
Nav aids : NIL  
Radio : Mukah Info 121.90



### 1.11 Flight Recorders

Nil

### 1.12 Wreckage and Impact Information

Not relevant to this incident

### **1.13 Medical and pathological Information**

Not relevant to this incident

### **1.14 Fire**

No fire was observed

### **1.15 Survival Aspects**

Not Applicable

### **1.16 Test and Research**

Not relevant to this incident

### **1.17 Organizational and Management Information**

MASwings is a subsidiary of Malaysia Airlines operating ATR 72-500, ATR 72-600 and DHC-6 VIKING aircraft from Kota Kinabalu, Miri and Kuching. They began operations from 1<sup>st</sup> October 2007 serving domestic and rural scheduled passenger services.

The latest Air Operators Certificate was issued by the Department of Civil Aviation Malaysia on the 30<sup>th</sup> Sept 2014 and was extended to 30<sup>th</sup> Sept 2016.

### **1.18 Additional Information**

#### **SITE OBSERVATION**

The site observation on the 26<sup>th</sup> August 2015 was made at Mukah Airport. The right main wheel and nose wheel track showed the aircraft started to veered at position 150meters (492feet) after touchdown and approximately 30meters (98feet) after passing the apron. See photos:



### **Rear View**

Picture shown the aircraft come to a complete stop and nosewheel marking on the grass followed by left main wheel marking.



### **Front View of Nose Wheel**

The Nose wheel veer to the left

### Engineering Report

Following the incident, an engineering team has carried out inspection on 9M-SSB. Inspection carried out on aircraft exterior and lower fuselage for damage, found satisfactory. Right hand main wheel and nose wheel covered with mud.

Area clean. Both main wheel assy and nose wheel inspected for damage and found satisfactory. And then, Nose wheel steering collar inspected for signs of damage and excessive play found nil abnormalities.

Aircraft towed back to apron. Engineer to carried out nose wheel steering operational test. Nose wheel steering operational test carried out and found satisfactory with tiller centered found nose wheel also centered. Mechanical lock aligned with notch on nose landing gear. Nose wheel steering cable inspected and found satisfactory.

Engineer to carried out Main landing gear attachment to fuselage and inspection carried out found attachment are secure.

To carried out nose landing gear attachment to fuselage inspection. Inspection carried out and found attachment are secure.

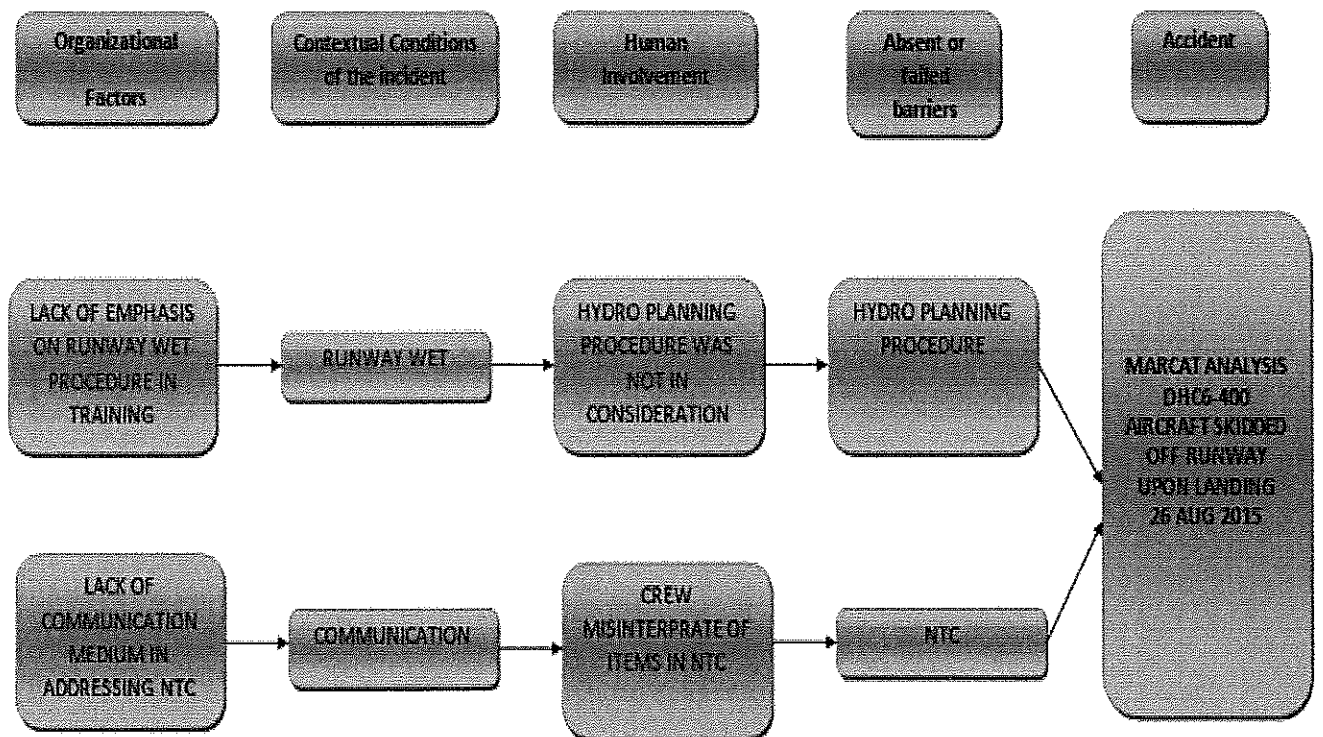
#### **1.19 Useful or Effective Investigation Techniques**

The investigation is being conducted in accordance with DCA approved ATC policies and procedures, and following Malaysia Airline Root Cause Analysis Technique.

#### **2.0 Investigation Findings**

1. Weather was reported moderate rain with a wet runway condition, Crew did not plan for hydro planning
2. Crew did not aware of NTC.
3. Nose wheel landing gear veered to the left upon contact with the runway.

### 3.0 MARCAT Analysis



#### RECOMMENDATIONS:

1. To include on next base check syllabus as discussion item on hydro planning procedure

*Action by PIC Training DHC-6*

2. To include NTC in discussion item next base check syllabus

*Action by PIC Training DHC-6*

3. NTC will be notify via email for acknowledgement

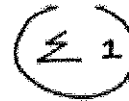
*Action by PIC DHC-6*

**APPENDIXES :**

1. Compliance sheet
2. Weather report
3. Fuel Chit
4. CFP
5. Load Sheet
6. Trim Sheet
7. TAF
8. MOR
9. NTC



**APPENDIX 1**



**TECHNICAL CREW COMPLIANCE SHEET**

**IS YOUR LICENSE, C of T, IRR, SEP & PASSPORT VALID?  
HAVE YOU RENEWED YOUR LICENCE?  
DON'T DELAY TO THE LAST MOMENT!!!**

LEET : ORNC6 / ATR72      DATE : 20/8/15  
 LIGHT NUMBER : TR9563      AIRCRAFT REGISTRATION : NM-958  
 REPORTING : 0470      DEPARTURE : 0855  
 IRR/IRAL :      DUTY END :

**OPERATING / POSITIONING**

POSITION	STAFF ABB	NAME	LC EXPIRY	IR EXPIRY	SIT EXPIRY	SEP EXPIRY	SIGNATURE
Captain			01-12-15	05-01-15	43-11-15	08-03-16	<i>[Signature]</i>
1st Officer			01-07-16	15-06-16	04-12-15	17-04-16	<i>[Signature]</i>

I, Captain HERMAN Commander of the above flight have inspected the license of the above crew and found them current.  
 Signatories above also confirm that their SEP, passport and other travel documents are valid as necessary.  
 I also certify that my own license is in current status and have read for compliance the pre-flight requirements stated below.

SIGNATURE : *[Signature]*  
 LICENCE NUMBER : 2427  
 DATE : 26 - AUGUST - 2015

*[Signature]*  
 CAPTAIN  
 HERMAN  
 AIRCRAFT REGISTRATION  
 NM-958

**PRIMARY PRE-FLIGHT REQUIREMENTS**

- The fuel on board the aircraft is adequate for the particular flight in accordance with the company's approved aircraft fuel policies.
- All operations, administrative restrictions and statutory requirements have been complied with.
- He is in possession of all the weather information available and considers the weather conditions for takeoff and enroute operations are satisfactory for flight.
- Current issues of NOTAMS, Route Information Data and Aircraft Information have been carefully read and are found adequate for flight.
- The flight had been planned in accordance with Company procedures.
- All Statutory and Company documents are on board.

White - CREW COPY    Yellow - OFFICE COPY

*[Signature]*  
 CAPTAIN  
 HERMAN  
 AIRCRAFT REGISTRATION  
 NM-958

**APPENDIX 2**

**MAS**

METAR REPORT

STATION MKAM

DATE/TIME \_\_\_\_\_

WIND 080/05

VISIBILITY 4-6

MR TH

FEW \_\_\_\_\_

SCT \_\_\_\_\_

BKN 020

OVC \_\_\_\_\_

QNH \_\_\_\_\_

TEMP \_\_\_\_\_

**MAS**

METAR REPORT

STATION MKAM

DATE/TIME \_\_\_\_\_

WIND 020/05

VISIBILITY 6-8

TH DR

SE SW

FEW \_\_\_\_\_

SCT \_\_\_\_\_

BKN 020

OVC \_\_\_\_\_

QNH \_\_\_\_\_

TEMP \_\_\_\_\_

**APPENDIX 3**

**MASwings Sdn. Bhd.** (773647-A)

**FUEL CHIT** (3)

REG. NO. \_\_\_\_\_ AIRLINE \_\_\_\_\_ AIRCRAFT TYPE \_\_\_\_\_

FLY DATE 07/01/11 FROM MKAM TO ...

REGULATED LANDING WT \_\_\_\_\_

AGD BURN-OFF \_\_\_\_\_

REGULATED TAKE-OFF WT \_\_\_\_\_ **A**

MAXIMUM TAKE-OFF WT PERFORMANCE LIMITATION \_\_\_\_\_ **C**

LOWER A, B, C, OR D \_\_\_\_\_

ESTIMATED ZFW \_\_\_\_\_

MAXIMUM FUEL AVAILABLE \_\_\_\_\_

MAXIMUM TANK CAPACITY \_\_\_\_\_

MINIMUM SECTOR FUEL (MSF) \_\_\_\_\_

EXCESS FUEL AVAILABLE \_\_\_\_\_

LOADSHEET FUEL \_\_\_\_\_

PLUS TAXI FUEL \_\_\_\_\_

SECTOR FUEL REQUESTED \_\_\_\_\_

CENTRE BALLAST FUEL \_\_\_\_\_

TOTAL FUEL IN-TANKS \_\_\_\_\_ **KG / LB**

TANKERING  YES / NO

SIGNATURE \_\_\_\_\_ CAPTAIN / DISPATCHER

Distribution: White (Original) - Duty Engineer, Green - Captain, Blue - Loadsheets, Pink - Ops/Station File

1664 / JUN / 2014

**REGULATED TAKE-OFF WT** \_\_\_\_\_

**REGULATED TAKE-OFF WT** \_\_\_\_\_

REGULATED TAKE-OFF WT	MAXIMUM TAKE-OFF WT	EXCESS FUEL
_____	_____	_____

NUMBER OF PASSENGERS 08

MEL/DOG REF. \_\_\_\_\_

PENALTY: \_\_\_\_\_

NOTE: \_\_\_\_\_

**APPENDIX 4**

MAS DHC - 8 NAVIGATION FUEL LOG												
FROM	MERAH (WIBOR)		FLY NO		DATE		CAPTAIN		ATC/TFC INFO WEATHER			
TO	SUBJ/VABGK		MSA	DIST	ATO	EST	ETA	ARR		SQ		
SEMBOGOM	ARAB BARVO	237	2A	46		0:35	04.00	ARR		SQ		
	MURKAD	237	2R	56		0:22		ARR		SQ		
FUEL REQUIREMENT (SW)			PCN		ARR		SQ					
START & TAST			20	END	2	40	CODE	MM	MM			
A - B + 1% (BFW)			600	END			LAT/LONG	MM	MM			
APPROACH & LAND			30	RTOW	1050 PD		RWY	MM	MM			
B - C + 6% (BFW)			170		1070 PD		LENGTH	MM	MM			
HOLD AT ALT (MIN)			300	CHKD	SCN	ACT	ELEV	MM	MM			
BURNED FUEL (BFW)			1130	OFF	88.5		SFC	MM	MM			
OFF CHECKS FUEL				ON	86.05		RMKS					
EXTRA				TOTAL	1:38		RECOMM					

DHC - 8 DIVERSION FUEL LOG												
FROM	MERAH (WIBOR)		FLY NO		DATE		CAPTAIN		ATC/TFC INFO WEATHER			
TO	SUBJ/VABGK		MSA	DIST	ATO	EST	ETA	ARR		SQ		
WISGA	BATANG DYA	190	20	14		0:07		ARR		SQ		
	VSI (VOR)	190	20	25		0:08		ARR		SQ		
FUEL REQUIREMENT (SW)			PCN		ARR		SQ					
B - C + 6% (BFW)			170	END			CODE	MM	MM			
HOLD (MIN)			300	END			LAT/LONG	MM	MM			
			470	RTOW			RWY	MM	MM			
							LENGTH	MM	MM			
				CHKD	SCN	ACT	ELEV	MM	MM			
				OFF			SFC	MM	MM			
OFF CHECKS FUEL				ON			RMKS					
EXTRA				TOTAL			RECOMM					

**APPENDIX 5**

**LOAD DISTRIBUTION SHEET** (Z5)

(ALL WEIGHTS IN KILOS)

TAMM OTTER  
CRG 1 - 100 PAX / FREIGHT SERVICE

**MASwings**

FROM: <b>MYV</b>	TO: <b>MRM</b>	FLIGHT NO.: <b>MY3332</b>	DATE: <b>26 AUG 13</b>	A/C. REGN.: <b>9M-188</b>	SERIAL NO.:
------------------	----------------	---------------------------	------------------------	---------------------------	-------------

M.T.O.W	<b>5670</b>		
B.O.W	<b>3615</b>	CG INDEX	<b>7.26</b>
PAYLOAD PLUS FUEL	<b>2055</b>	CG WEIGHT	<b>8615</b>
LESS FUEL	<b>991</b>		
MAX. ALLOWABLE PAYLOAD	<b>1057</b>		

DESTINATION	<b>MRM</b>				SUB - TOTAL	TOTAL WT.
PASSENGER	T					PAX WT.
	J	<b>8</b>				<b>581</b>
						SUB - TOTAL
CABIN LOADING	CA					CABIN
	CB					
	CC					
	CD					
	CE					
FORWARD	F	<b>30</b>				FWD
	G					
	H					
	I					
AFT	A	<b>65</b>				AFT
	B					
	C					
	D					
BHEL	E					BHEL
	F					
	G					
	H					
						Total Payload
						<b>656</b>

**Last Minute Changes**

DEST	DETAILS	CL. CMT	WEIGHT
LMC TOTAL			

**Balance Conditions**

ROW	PASSENGERS	CABIN DEAD LOAD
1		CA
2		CB
3		CC
4		CD
5		CE
6		
TOTAL	<b>8</b>	TOTAL

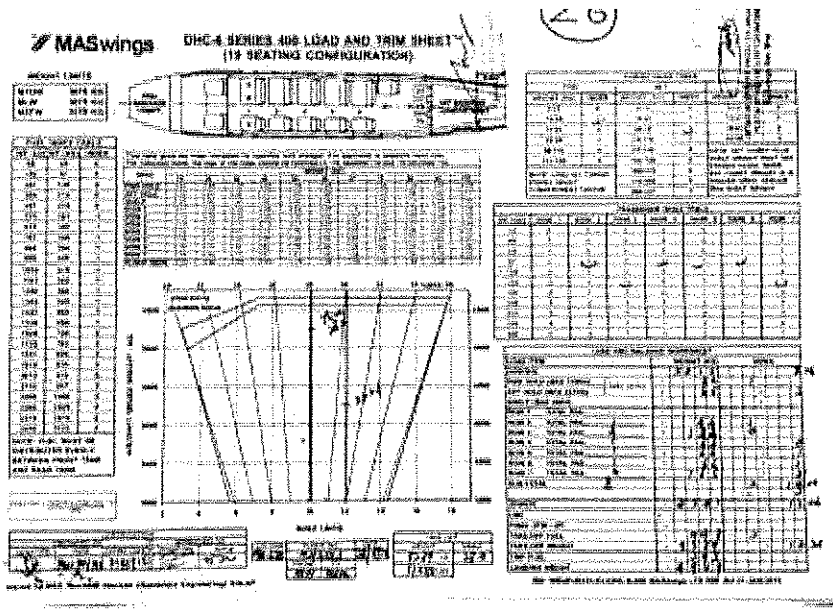
ZERO FUEL WT MAX. 3875 KG	<b>4243</b>
FUEL	<b>998</b>
TAKE OFF WEIGHT MAX. 3875 KG	<b>5239</b>
BURN OFF	<b>295</b>
LANDING WEIGHT MAX. 3875 KG	<b>4944</b>

Max = 1.2052 Sec

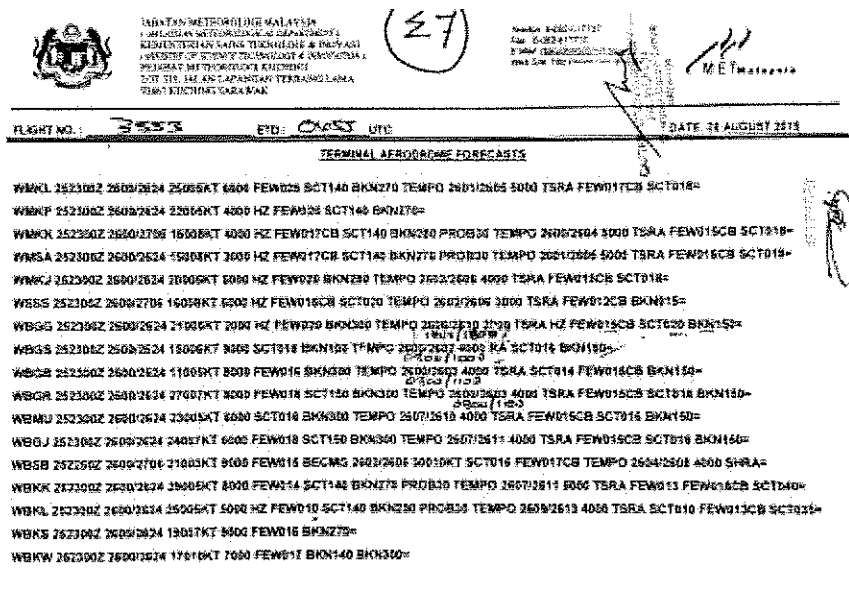
ZERO FUEL WEIGHT (LBS)	<b>9350</b>				
TAKE OFF WEIGHT (LBS)	<b>11350</b>	<b>10.26</b>	<b>25.0</b>	<b>10.26</b>	<b>25.0</b>
LANDING WEIGHT (LBS)	<b>10900</b>				

Checked by: **[Signature]**      RW-MYVH      DIRECTOR  
Checked & Approved      WBE (S)      KAPR (S)  
Checked by:      **[Signature]**      ATM

APPENDIX 6



APPENDIX 7



APPENDIX 8

Form Occurrence Report  
Department of Civil Aviation  
Lot 27, Block 7, Persiaran  
Kuala Lumpur, Kuala Lumpur  
60000 MALAYSIA

OCCURRENCE REPORT  
DEPARTMENT OF CIVIL AVIATION  
MALAYSIA

(E8)  
A

(DCA Form 9 - OR)  
Form 9 (MSD) 4324  
Issued by  
Safety MDM@ca.gov.my

Complete all sections where information is relevant. For multi-engine aircraft, indicate which engine is affected.

Date received by DCA		DCA Occurrence No.	
Account Type and Series DCC-800	Registration 9M-SPG	Operator MASWING	Date of Occurrence 24-08-2015
<b>FLIGHT AND WEATHER DETAILS</b>			
Flight No. 9M-SPG	Altitude 10000	Wind 100/12	Primary Used 1
Flight MUSQ	Time 17:25	State SEA	Cloud 1000
To MUSQ	Altitude 10000	State SEA	Cloud 1000
Geog Position 6-10N	Altitude 10000	State SEA	Cloud 1000
Time of Day 17:25		Current Wind 100/12	
Date of Day 24-08-2015		Current Wind 100/12	
Altitude 10000		Current Wind 100/12	

**NARRATIVE**

FIRST SECTION OF THE DAY FOR DCA. OPERATIONAL FLIGHT NUMBER 9M-SPG. IT WAS THE COMMERCIAL FLIGHT. WEATHER THROUGHOUT THE FLIGHT THROUGHOUT WAS GENERALLY GOOD. HOWEVER INFORMATION RECEIVED FROM MUSQ AIRFIELD ATTEMPTED UPON ARRIVAL WAS, WIND 090/12, VISIBILITY 5000. FLIGHT AND RUNWAY WET. ON DESCEND CLEARER WITH MUSQ AIRFIELD AROUND 3000 FEET. ON FINAL APPROACH WITH THE AIRCRAFT CONFIGURED FOR LANDING AND CRUISE COMPLETE WE PROCEED LANDING AT MUSQ AIRFIELD. NO WINDING WIND INDICATED AS THE AIRCRAFT APPROX 500 FEET. ENGINE AND GEAR PROBLEMS FROM RIGHT. ON THE LANDING ROLL. AIRCRAFT STOPPED VIBR TO THE LEFT AS CONTINUED. VIBR DIRECTION OF ROLLER WAS SWAY TO THE COMMANDER TO MARKET THE VIBRING ON TO HIS EFFECT. DIFFERENTIAL POWER WAS APPLIED TO THE AIRCRAFT. BACK TO HIS COMMANDER AND THE AIRCRAFT CONTINUE TO VIBR TO THE LEFT AND END UP EXITING THE RUNWAY ONTO THE GRASS BANK. AT THE AIRCRAFT STOP. CRUISE AND PROBLEMS COMPLETE. WAS PAROLE NOT AIRCRAFT. REPORTED BY PILOT AND CAPTAIN. AIRCRAFT LINE REPORTED. REPORTED BY PILOT AND CAPTAIN.

**ENGINEING DETAILS**

Account Operator's No.	Engine Type & Series	Engine No.	Manufacturer
Component Part	Location on aircraft	Serial No.	Quantity
Manufacturer	Part No.	Serial No.	Quantity
Is there any published Airworthiness Information or Service Bulletin (e.g. AD) applicable to component?		Reference to the Component Section of Aircraft or Engine Log	

REPORT  
Original to submit to the authority for full subject to mandatory requirements

Can the information be disseminated in the interest of safety?

YES  NO

Organization

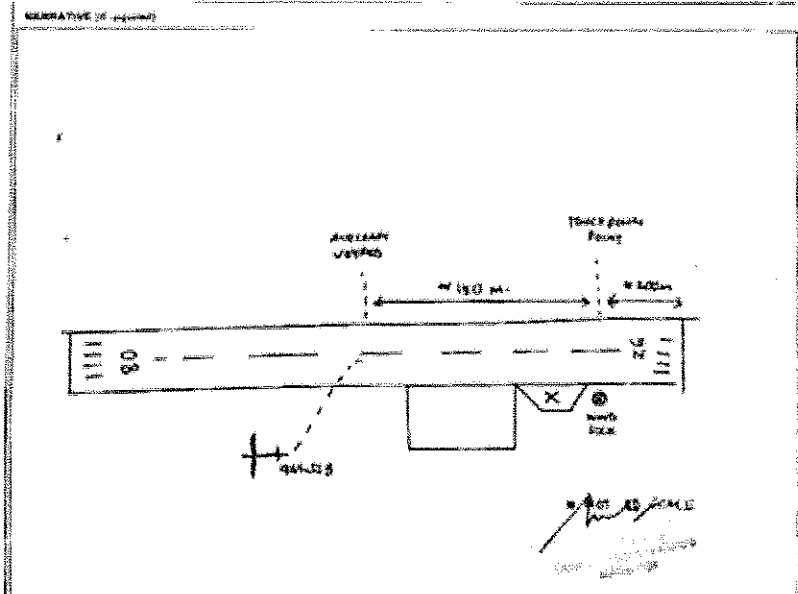
Page One Revised form

YES <input type="checkbox"/>	Position	Reference No.	Date
NO <input type="checkbox"/>	CAPTAIN	AWJ 1002 / 0206 / 1111	27 08 2015

Address of responsible authority to be contacted (optional)

Type

Name



**APPENDIX 9**

**NTC**

**MASwings** **NOTES TO CREW AND MAINTENANCE ENGINEERS (NTC)** PAGE 12

AD FREE **ENG & TWIN ENTS** AD INDEX

Item No.	Action Frequency	Description of Action, NTC Number and the responsible person	Event Statement	Frequency (Operational Hours/Flight Hours)	Priority	Remarks
		<p>CREW TO MONITOR FUEL PRESSURE (CONSOLE) LIGHTS AND INSTALLED FUEL LINES AND VALVES AT ALL TIMES AND REPORT ANY PROBLEMS.</p>		24-10-13	Urgent	
		<p>CREW TO MONITOR FUEL PRESSURE (CONSOLE) LIGHTS AND INSTALLED FUEL LINES AND VALVES AT ALL TIMES AND REPORT ANY PROBLEMS.</p>		24-10-13	Urgent	
		<p>CREW TO MONITOR FUEL PRESSURE (CONSOLE) LIGHTS AND INSTALLED FUEL LINES AND VALVES AT ALL TIMES AND REPORT ANY PROBLEMS.</p>		24-10-13	Urgent	