
Loss of directional control on landing, McDonnell Douglas MD-82, PK-LMM, Hassamuddin Airport, Indonesia, 31 October 2003

Micro-summary: This MD-82 lost directional control on landing.

Event Date: 2003-10-31 at 0737 UTC

Investigative Body: National Transportation Safety Committee (NTSC), Indonesia

Investigative Body's Web Site: <http://www.dephub.go.id/knkt/>

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ACCIDENT & INCIDENT REPORTS

Occurrence Brief

Occurrence Details

Occurrence Number:	03.21.10.01.				
Release Date:	April 2004				
Occurrence Type:	Incident				
Location:	Hassanuddin Airport.				
State:	Indonesia				
Occurrence Date:	31 October 2003				
Time/Zone:	0737 Z				
Highest Injury Level:	Minor				
Injuries:	Fatal	Serious	Minor	None	Total
Crew	0	0	8	0	8
Passenger	0	0	127	0	127
Ground	0	0	0	0	0
Total	2	0	135	0	135

Aircraft Details

Aircraft Manufacturer:	McDonnell Douglas
Aircraft Model:	MD 82
Aircraft Registration:	PK - LMM
Type of Operation:	Air Transport, Domestic, Passenger, Schedule
Damage to Aircraft:	None
Departure Point:	Ambon
Destination:	Hassanuddin

FACTUAL INFORMATION

On 31 October 2003, JT – 787 / PK- LMM was on flight from Ambon to Makassar , it was scheduled and normal flight. Before landing at Makassar, PK LMM conducted approach using ILS R/W 13 with slight rain weather condition visibility 4 km, wind speed and direction variable (050 / 7-8 knots according PF Nav. displayed), runway visually insight after aircraft established localizer runway 13. Altitude 2000 ft (\pm 10 nautical mile according to Distance Measuring Equipment ILS runway 13). Landing weight : 118.000 lbs. At 07.35 Z, aircraft landed normal positively at touch down zone runway 13 followed by deployment of spoiler automatically and engine thrust reversers (L/R) \pm 1.4 EPR.

The deceleration process of the aircraft was normal during landing roll out until the aircraft speed reach 80-60 knots. After passing intersection taxiway Charlie (C), aircraft slowly drifted to the right hand side of centerline runway 13, pilot flying (PF) try to recycle reverses and brought to maximum value about 2.0 EPR followed by pushing left hand rudder to counteract.

The aircraft continuously drifted slowly to right hand side of runway 13 even though manual braking was done by the both pilot simultaneously (maximum braking). After all the actions seem useless PF ask to PNF to command “BRACE FOR IMPACT” through public address. The aircraft rested to complete stop after right hand main gear sank into the grass its about 1 meter of right hand edge of the runway. Nose landing gear and left hand landing gear are stayed on the runway surface.

Check list on ground emergency evacuation performed by pilot not flying (PNF), meanwhile PF tried to kept two way communication with ATC to told that JT 787 need assistant and would be evacuate passenger on runway. After all check list have been perform by PNF, PF instructed cabin attendant through public address mentioned that emergency situation are terminated and no need of evacuation required.

Flight attendant - 1 came to cockpit, received instruction to check all passenger condition quickly and reported that everything are under control. Through pilot not flying (PNF) given command to (disarm slide bar) and gave information for passenger to leave the aircraft from door L1 and joint with rescue team. According the regulation PF with PNF filled up some form report at Briefing Office. Both pilots were proceed to Lion Office at main terminal building to joint with rest of the crew.

ANALYSIS

Based on the interviewed, the crew stated that :

- Wind speed and direction were variable (direction, speed 7-8 knots according to PF navigation displayed, aircraft landed normal positively at touch down zone of runway 13 followed by automatic deployment of spoiler and engine thrust reversers (L/R) \pm 1.4 EPR (Fig.1)
- The deceleration process of the aircraft was normal from the beginning until the aircraft speed reached 60-80 knots. After passing intersection with taxiway Charlie (C) then the aircraft slowly drifted to the right hand side of centerline runway 13 and then the pilot flying (PF) tried to recycle the reverser and increase it to maximum value about 2.0 EPR followed by stepping left hand rudder to counteract.(Fig.2)

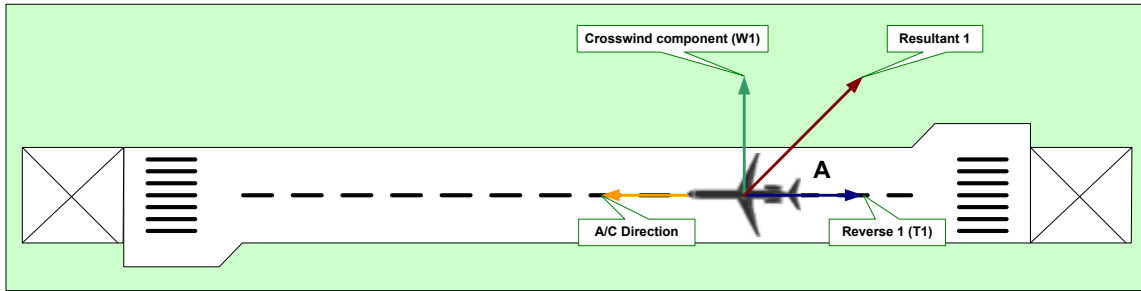


Figure 1. Thrust Reverse 1.4 EPR

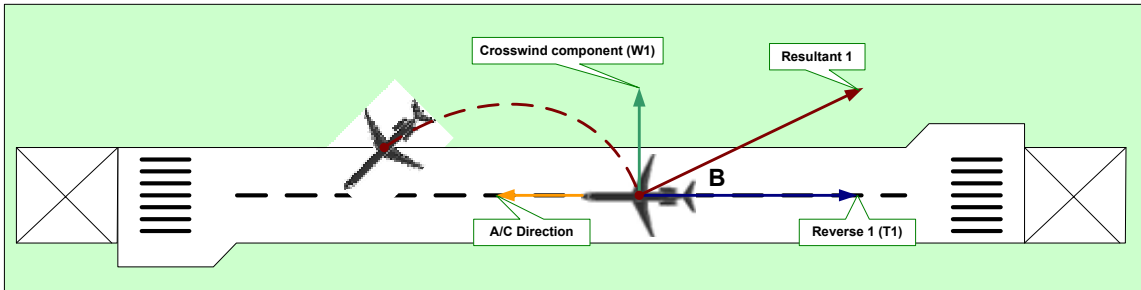


Figure 2. Thrust Reverse 2.0 EPR

Angle B is bigger than A and bigger than C. Concluded that the bigger opposite forces of thrust applied (reverse and brake) the bigger resultant angle. The bigger resultant angle would make the correction to the centerline more difficult.

In the AOM (Aircraft Operation Manual volume II page 46B), the landing technique for wet runway states that: “Do not use more than reverse idle thrust at speeds below 60 knots.....If difficulty in maintaining directional control is experienced during reverse thrust operation, reduce thrust as required and select forward idle, if necessary, to maintain or regain directional control. Do not attempt to maintain directional control by using asymmetric reverse thrust”.

At lower speed, the correction to centerline using rudder would be more difficult since the rudder effectiveness is low, using the nose wheel steering would be more effective.

Angle **a** is bigger than **b**, this proved with equation:

$$\text{Tan}^{-1}(\mathbf{a}) = \mathbf{T1} / \mathbf{W1}$$

$$\text{Tan}^{-1}(\mathbf{b}) = \mathbf{T2} / \mathbf{W2}$$

According to equation above we can conclude that:

$$\mathbf{T1} > \mathbf{T2} \text{ and } \mathbf{b} < \mathbf{a}$$

Same condition occurs to the resultant force, because:

$$\mathbf{R} = \sqrt{(\mathbf{T}^2 + \mathbf{W}^2)} \text{ will result } \mathbf{R1} > \mathbf{R2}$$

CONCLUSIONS

The slippery runway and crosswind had drifted the aircraft, while counter action of pilot which was not follow the procedure in the AOM, had fail to brought the aircraft back to centerline.

SAFETY ACTION

As a result of this occurrence, National Transportation Safety Committee issues the following safety recommendation:

RECOMMENDATION:

Landing incidents, especially overruns on wet runway which has repeatedly occurred in Hassanuddin airport shown similar characteristics. These incident indicate a serious deficiency in the pilots airmanship during landings under adverse weather condition. Referring to the analysis, NTSC recommendation are addressed to the airline operator to provide the flight crews with additional training for landings on slippery runway and use of engines reverses on such condition.