

**FINAL**

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**NATIONAL  
TRANSPORTATION  
SAFETY  
COMMITTEE**

**Aircraft Accident Investigation Report**

**PT. AVIASTAR MANDIRI (Pty Ltd)**

**PK-BRM ; CASA 212-200**

**Tanjung Bara Airport, Sangata**

**East Kalimantan**

**Republic of Indonesia**

**11 January 2007**



**NATIONAL TRANSPORTATION SAFETY COMMITTEE  
MINISTRY OF TRANSPORTATION  
REPUBLIC OF INDONESIA  
2009**



This report was produced by the National Transportation Safety Committee (NTSC), Karya Building 7<sup>th</sup> Floor Ministry of Transportation, Jalan Medan Merdeka Barat No. 8 JKT 10110, Indonesia.

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# TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	<b>I</b>
<b>GLOSSARY</b> .....	<b>III</b>
<b>1 FACTUAL INFORMATION</b> .....	<b>2</b>
<b>1.1 History of Flight</b> .....	<b>2</b>
<b>1.2 Injuries to Persons</b> .....	<b>3</b>
<b>1.3 Damage to Aircraft</b> .....	<b>3</b>
<b>1.4 Other Damage</b> .....	<b>3</b>
<b>1.5 Personnel Information</b> .....	<b>3</b>
1.5.1 Pilot in command (PIC).....	3
1.5.2 Copilot .....	4
<b>1.6 Aircraft Information</b> .....	<b>4</b>
1.6.1 Aircraft Data .....	4
1.6.2 Engine Data .....	5
1.6.3 Propeller Data .....	5
1.6.4 Weight and Balance (W&B).....	6
<b>1.7 Meteorological Information</b> .....	<b>6</b>
<b>1.8 Navigation Equipment</b> .....	<b>6</b>
<b>1.9 Communication Equipment</b> .....	<b>6</b>
<b>1.10 Aerodrome Data</b> .....	<b>7</b>
1.10.1 Aerodrome Data .....	7
1.10.2 Runway .....	7
<b>1.11 Flight Recordings</b> .....	<b>7</b>
1.11.1 Flight Data Recorder (FDR) .....	7
1.11.2 FDR Reading .....	7
1.11.3 Cockpit Voice Recorder (CVR) .....	8
<b>1.12 Wreckage and Impact Information</b> .....	<b>8</b>
1.12.1 Impact evidence .....	9
<b>1.13 Medical and Pathological Information</b> .....	<b>9</b>
<b>1.14 Fire</b> .....	<b>9</b>
<b>1.15 Search and survival aspects</b> .....	<b>9</b>

<b>1.16</b>	<b>Test and Reseach.....</b>	<b>10</b>
<b>1.17</b>	<b>Management and Organisational Information.....</b>	<b>10</b>
1.17.1	Organisation of PT. Aviastar Mandiri (Pty Ltd).....	10
<b>1.18</b>	<b>Other Information.....</b>	<b>10</b>
1.18.1	CFIT and ALAR training .....	10
1.18.2	Runway approach visual guidance .....	11
1.18.3	Power Locking Automatic Locking System Casa 212-200 PK BRM.....	11
1.18.4	Sketch of the accident location for PK-BRM.....	12
<b>2</b>	<b>ANALYSIS.....</b>	<b>13</b>
<b>3</b>	<b>CONCLUSION .....</b>	<b>14</b>
<b>3.1</b>	<b>Findings.....</b>	<b>14</b>
<b>3.2</b>	<b>Causes.....</b>	<b>14</b>
<b>4</b>	<b>RECOMMENDATIONS.....</b>	<b>15</b>
<b>4.1</b>	<b>Recommendation to Aviastar Mandiri .....</b>	<b>15</b>
<b>4.2</b>	<b>Recommendation to PT. Kalimantan Prima Coal.....</b>	<b>15</b>

## GLOSSARY

AD	Airworthiness Directives
AGL	Above Ground Level
AMSL	Above Mean Sea Level
AOC	Air Operator Certificate
ATC	Air Traffic Control
ATPL	Air Transport Pilot License
CPL	Commercial Pilot License
CSN	Cycles Since New
CVR	Cockpit Voice Recorder
DGAC	Directorate General of Air Communications
DME	Distance Measuring Equipment
F/O	first officer
FDR	Flight Data Recorder
hrs	time (24 hour clock)
IFR	Instrument Flight Rules
IIC	Investigator-In-Charge
ILS	Instrument Landing System
kg	kilogram(s)
km	kilometre(s)
kts	knots (nm/hour)
mm	millimetre(s)
MTOW	Maximum Take-Off Weight
nm	nautical mile(s)
NTSC	National Transportation Safety Committee
°C	degrees Celcius
PIC	Pilot-In-Command
QFE	Height above airport elevation (or runway threshold elevation) based on local station pressure
QNH	Altitude above mean sea level based on local station pressure
RPM	Revolutions Per Minute
S/N	Serial number
TS/RA	thunder strom and rain
TSN	Time Since New
TT/TD	ambient temperature/dew point
UTC	Universal Time Co-ordinated
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions





## **SYNOPSIS**

On 11 January 2007, a Casa 212-200 aircraft registered PK-BRM, operated by PT. Aviastar Mandiri Pty Ltd, was on a charter flight from Balikpapan, East Kalimantan to Tanjung Bara, East Kalimantan.

The aircraft departed from Balikpapan at 23:00 with a planned flight time of 55 minutes at an altitude of 7000 feet. There were 13 people on board; two pilots, a maintenance engineer, and 10 passengers. The pilot in command (PIC) was the pilot flying for the sector to Tanjung Bara, and the copilot was the monitoring/support pilot.

The flight was normal until 5 minutes before landing when the number-1 (left engine) generator malfunctioned. The pilot in command (PIC) asked the maintenance engineer (on board the aircraft), who advised that there was no problem for the aircraft operations.

The aircraft made its final approach to runway 04 at Tanjung Bara at 23:50. The aircraft touched down to the right of the centreline, then diverged right into soft wet ground, impacting a channel embankment and subsequently a barbed-wire airport perimeter fence.

The investigation determined that aircraft was not being flown on a stabilized approach and subsequently touched down to the right of the runway centerline. It then veered to the right of centerline after touchdown and the PICs effort to bring the aircraft back to the runway centreline by using aileron was ineffective.

There was no evidence that visibility affecting visual acquisition of the runway was a factor. However, the investigation considered that a visual approach guidance system such as Visual Approach System Indication (VASI), may have provided additional visual cues to alert the pilots to the prevent the unstabilized approach.

# 1 FACTUAL INFORMATION

## 1.1 History of Flight

On 11 January 2007, a Casa 212-200 aircraft registered PK-BRM, operated by PT. Aviastar Mandiri Pty Ltd, was on a charter flight from Balikpapan, East Kalimantan to Tanjung Bara, East Kalimantan.

An aircraft maintenance engineer carried out a pre flight inspection at 22:06 Coordinated Universal Time<sup>1</sup> (UTC), and 15 minutes before departure, certified that the aircraft was airworthy. The aircraft departed from Balikpapan at 23:00 with a planned flight time of 55 minutes at an altitude of 7000 feet. There were 13 people on board; two pilots, a maintenance engineer, and 10 passengers. The pilot in command (PIC) was the pilot flying for the sector to Tanjung Bara, and the copilot was the monitoring/support pilot.

The weather forecast for Tanjung Bara Airport, issued by the Bureau of Meteorology and Geophysics, was visibility at 10 km, wind from 350° at 5 knots.

The flight was normal until 5 minutes before landing when the number-1 (left engine) generator malfunctioned. The pilot in command (PIC) asked the maintenance engineer (on board the aircraft), who advised that there was no problem for the aircraft operations.

The aircraft made its final approach to runway 04 at Tanjung Bara at 23:50. The aircraft touched down to the right of the centreline, then diverged right into soft wet ground, impacting a channel embankment and subsequently a barbed-wire airport perimeter fence.

The passengers immediately evacuated the aircraft through the rear cabin door which which was opened by the maintenance engineer. Five minutes later the airport fire rescue service vehicles arrived and provided assistance. None of the occupants were injured.

The pilots reported that during the descent, as well as the the number-one (left engine) generator failing, the left engine torque was fluctuating during the approach, and was tending to increase above normal parameters.

The aircraft was higher than glideslope during the approach, but the copilot indicated that the aircraft could be landed safely from the approach. The cockpit voice recorded information revealed the copilot saying *sure in*. He subsequently stated that this statement meant that they could land the aircraft from the approach. The PIC explained that because the aircraft was veering to the right, he endeavoured to hold the control column to the left by using his

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<sup>1</sup> The 24-hour clock is used in this report to describe the local time of day, Central Indonesia Standard Time (Waktu Indonesia Tengah (WITA)) as specific events occurred. Central Indonesian Standard Time is Coordinated Universal Time (UTC) + 8 hours.

left hand, on the basis that he could bring the aircraft back to the left on the runway, but he did not succeed in redirecting the aircraft to the left.

He reported that he had difficulty moving the power lever into the ground mode.

## 1.2 Injuries to Persons

Condition	Crew	Passengers	Others	TOTAL
Deceased	-	-	-	-
Severely Injured	-	-	-	-
Minor Injuries	-	-	-	-
Uninjured	3	10	-	13
Total	3	10	-	<b>13</b>

## 1.3 Damage to Aircraft

The nose landing gear separated from the aircraft and the lower part of the nose section including the radome, and the cabin floor were substantially damaged. The leading edges of both wings were substantially damaged.

## 1.4 Other Damage

Ten meters of the northern perimeter fence of the airport was demolished, and approximately 5 meters of the drainage channel wall/embankment was damaged.

## 1.5 Personnel Information

### 1.5.1. Pilot in command (PIC)

Gender : Male  
Date of Birth : 31 December 1963  
Nationality : Indonesia  
License/Certificate Number : ATPL/4774  
Date of License Issuance : 31 October 2006  
License Validity : 31 April 2007  
Type Rating : Casa 212-200, DHC-6, AS-202  
Instrument Rating : Valid

Date of Health Examination : 31 October 2006  
Certificate of Health : Class I  
Date of Line Check : 8 December 2006  
Date of Proficiency Check : 10 October 2006  
FLIGHT TIME  
Total Flying Hours : 5934.1 hours  
On type : 1900 hours

### **1.5.2. Copilot**

Gender : Male  
Date of Birth : 8 January 1965  
Nationality : Indonesia  
License/Certificate Number : CPL/5858  
Date of License Issuance : 19 July 2006  
License Validity : 30 January 2007  
Type Rating : Casa 212-200  
Instrument Rating : Valid  
Date of Health Examination : 19 July 2006  
Certificate of Health : Class I  
Date of Proficiency Check : 16 July 2006  
FLIGHT TIME  
Total time : 5080.2 hours  
On type : 600 hours

## **1.6 Aircraft Information**

### **1.6.1 Aircraft Data**

Model and Type : Casa 212-200  
Manufacturer : PT. Dirgantara Indonesia  
(IPTN)  
Serial Number : 91N/411  
Year of Manufacture : 1992  
Aircraft Registration : PK-BRM  
Certificate of Registration : 2332  
Certificate of Airworthiness valid : 31 August 2007  
to

Certificate of Registration valid to : 31 August 2007  
 Compass Swing valid to : 24 June 2007  
 Weight & Balance valid to : 23 September 2007  
 Radio Permit valid to : 17 October 2007  
 Insurance valid to : 12 November 2007  
 Total flying hours/date : 9,383.19 hours/11 January 2007  
 Total Cycles/date : 11.969 cycles/11 January 2007  
 Last inspection/date : A1 & A2 Insp./ 18 Oct. 2006  
 : A1 & A3 Insp./ 03 Dec.2006

### 1.6.2 Engine Data

Engine Type : Turbo propeller  
 Manufacturer : Garret  
 Type/ Model : TPE 331  
 Engine number-1 (Left engine)  
 Serial Number P37315C
 

- Time Since New : 7,198.35 hours
- Cycles Since New : 7,658 cycles
- Last inspection / date : 11 January 2007,  
198.35 hours Time Since New  
4,059 hours Time Since Overhaul

 Engine number-2 (Right engine)  
 Serial Number P37379C
 

- Time Since New : 8,564.45 hours
- Cycles Since New : 9,643 cycles
- Last inspection / date : 11 January 2007  
8,054.45 Time Since New  
1,978,91 Time Since Overhaul

### 1.6.3 Propeller Data

Propeller Type : Variable pitch propeller  
 Manufacturer : Dowty Rotol  
 Type/ Model : R334/4-B2-F/13

Propeller number 1 (Left)

Serial Number : DRG9708/89

- Time Since New : 3,734.45 hours
- Cycles Since New : 7,634 cycles
- Last inspection / date : 11 January 20077  
7,374,45 TSN  
2,382,40 TSO

Propeller number 2 (Right)

Serial Number : DRG-338/84

- Time Since New : 6,836,58 hours
- Cycles Since New : 6,900 cycles
- Last inspection / date : 11 January 2007

**1.6.4 Weight and Balance (W&B)**

Aircraft Empty Weight : 4,715.30 kg

Aircraft Empty CG from Datum Line : 6.024 meters

Index : 25.67 % MAC

The aircraft was loaded within prescribed weight and balance limitations.

**1.7 Meteorological Information**

Actual weather at the time of landing at Tanjung Bara Airport, East Kalimantan:

Wind Direction / Speed : 350° / 05 Knots

Visibility : 10 Km

Wind Conditions : Calm

**1.8 Navigation Equipment**

Not relevant to this accident

**1.9 Communication Equipment**

Not relevant to this accident

## **1.10 Aerodrome Data**

### **1.10.1 Aerodrome Data**

Aerodrome Name	: Tanjung Bara
Owner / Manager	: PT. Kalimantan Prima Coal (KPC)
Province	: East Kalimantan
Reference Point / Coordinates	: 00°32'02"N-117°38'58"E
Elevation	: 41 meters
Operational Classification	: Visual

### **1.10.2 Runway**

Runway directions	: 04 / 22
Dimensions	: 800 meters x 18 meters
Turning Area	: 2 x 1095 m <sup>2</sup>
Longitudinal slope	: 0.442%
Transverse Slope	: 1.5 %
Surface	: Asphalt
Strength	: 12,500 Lbs.

## **1.11 Flight Recordings**

### **1.11.1 Flight Data Recorder (FDR)**

Based on document approval number 21/D01/021/06 dated 24 May 2006, Jakarta.

Part number : 980-4120-RQUS

Serial number : 20531

Manufacturer : Honeywell International Inc.

### **1.11.2 FDR Reading**

The Reading of the FDR was carried out at the FDR readout facility of the Aviation Safety Council, Taiwan.

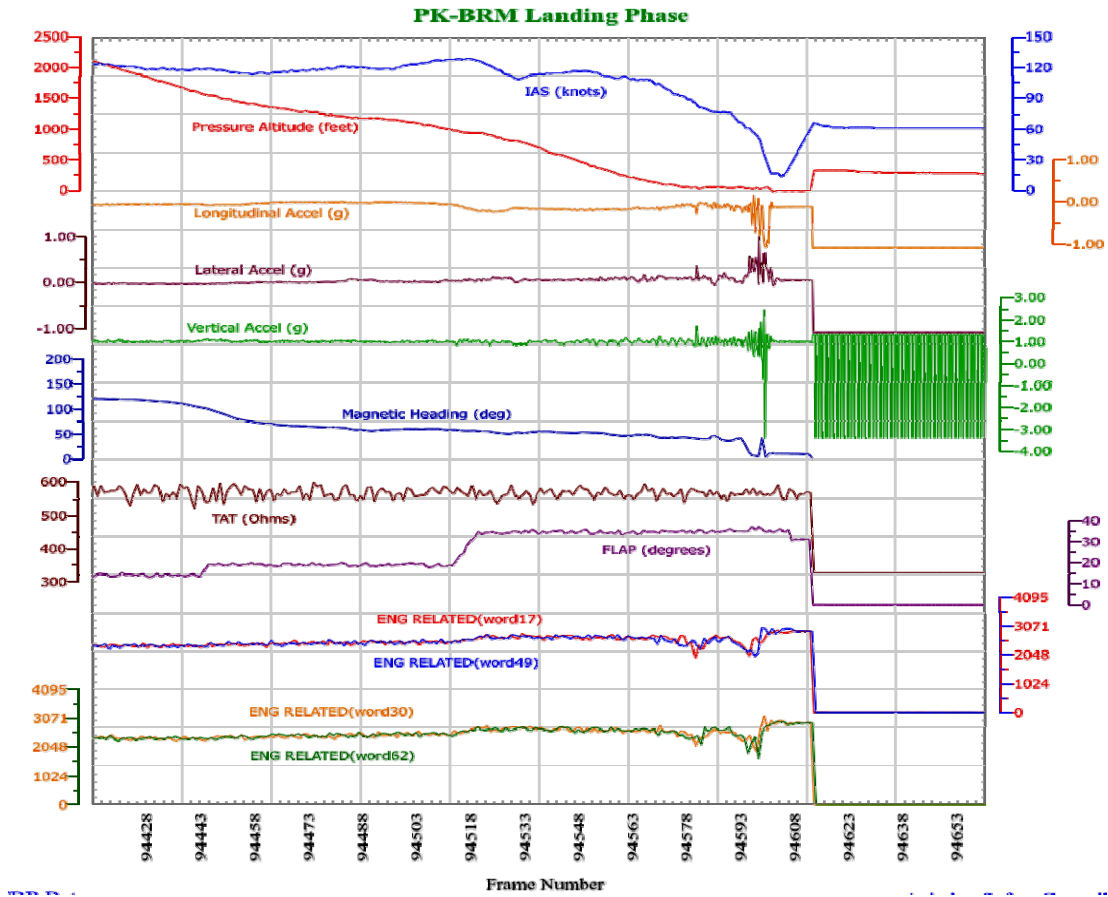


Figure 1: Results of the FDR Readout

### 1.11.3 Cockpit Voice Recorder (CVR)

Part number : 93-A100-80

Serial number : 61249

Model : A100A

Manufacturer : Fairchild Aviation Recorders

The recorded information on the CVR was good quality.

### 1.12 Wreckage and Impact Information

The nose landing gear separated from the aircraft during the impact with an embankment. The aircraft came to rest amongst trees, with the wings and lower fuselage substantially damaged.



### **1.12.1 Impact evidence**

An imprint of the left main landing gear was found 400 meters from the end of runway 04, and 2 meters to the right of the verge of the runway at an angle of approximately 10 degrees from the runway.

The first imprint of the right main landing gear was found about 150 meters further on from that imprint of the left main landing gear. Further right main landing gear imprints indicated that the aircraft bounced three times. The aircraft touched down with the right main landing gear settling on the grass and sank into the soft wet ground. The right main landing gear subsequently left a heavy continuous imprint in the soft ground providing evidence of an abrupt turn to the right before the aircraft impacted the embankment.



**Figure 2: Severed nose landing gear**

### **1.13 Medical and Pathological Information**

The three flight crew were examined at the accident site by the medical team from Kalimantan Prima Coal Airport, and declared to be healthy.

### **1.14 Fire**

There was no pre- or post-impact fire.

### **1.15 Search and survival aspects**

Soon after the aircraft came to rest, the rear cabin door was opened by the engineer and all passengers left the aircraft. The engineer then re-entered the cockpit to assist the PIC and copilot, who both stated that they were ok and could evacuate without assistance.

The airport rescue fire fighting service personnel attended the aircraft and transported the passengers to the airport terminal building.

## **1.16 Test and Reseach**

Not relevant to this investigation

## **1.17 Management and Organisational Information**

### **1.17.1 Organisation of PT. Aviastar Mandiri (Pty Ltd)**

Aircraft Owner : PT. Aviastar Mandiri  
Address : Puri Sentra Niaga B-29 Kalimalang  
Jakarta 13620, INDONESIA  
Phone : 021-8626789 Fax.021-8626813  
Aircraft Operator : PT. Aviastar Mandiri  
Address : Puri Sentra Niaga B-29 Kalimalang  
Jakarta 13620, INDONESIA  
Phone : 021-8626789 Fax.021-8626813  
Operating Cert. Number : AOC/135-029

## **1.18 Other Information**

### **1.18.1 CFIT and ALAR training<sup>2</sup>**

The DGCA introduced the CFIT ALAR training program using the United States Flight Safety Foundation' CFIT and ALAR material (Appendices G and H), to all Indonesian operators between 18 and 21 July 2005. The training for operators' training instructors and some line pilots was jointly conducted by the DGCA and International Civil Aviation Organization.

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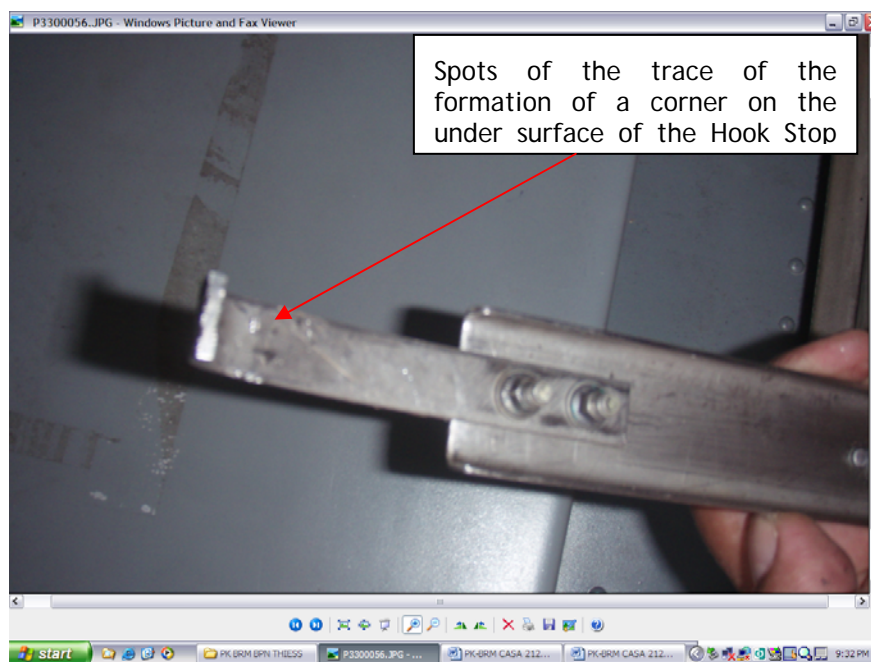
<sup>2</sup> Copies of the ALAR education and training programs, including video programs, are available in CD-ROM format and can be obtained directly from the FSF ([www.flightsafety.org](http://www.flightsafety.org)). This subject was extensively covered in the report published 22 October 2007 by the National Transportation Safety Committee into the Boeing 737 accident on 7 March 2007 at Yogyakarta. Recommendations were made in that report to the Directorate General of Civil Aviation and Indonesian airlines. [www.dephub.go.id/knkt](http://www.dephub.go.id/knkt)

### 1.18.2 Runway approach visual guidance

Runway lights were installed and operational, however there was no Visual Approach System Indication (VASI). The flight was in daylight and visual conditions were good with 10 km visibility..

### 1.18.3 Power Locking Automatic Locking System Casa 212-200 PK BRM

The investigation found that the power-lever, anti-reverse locking system showed signs of wear to the lower surface. However, there was no evidence that this contributed to the accident.



**Figure 3: Hook Stop of the Anti Reverse System**

### 1.18.4 Sketch of the accident location for PK-BRM

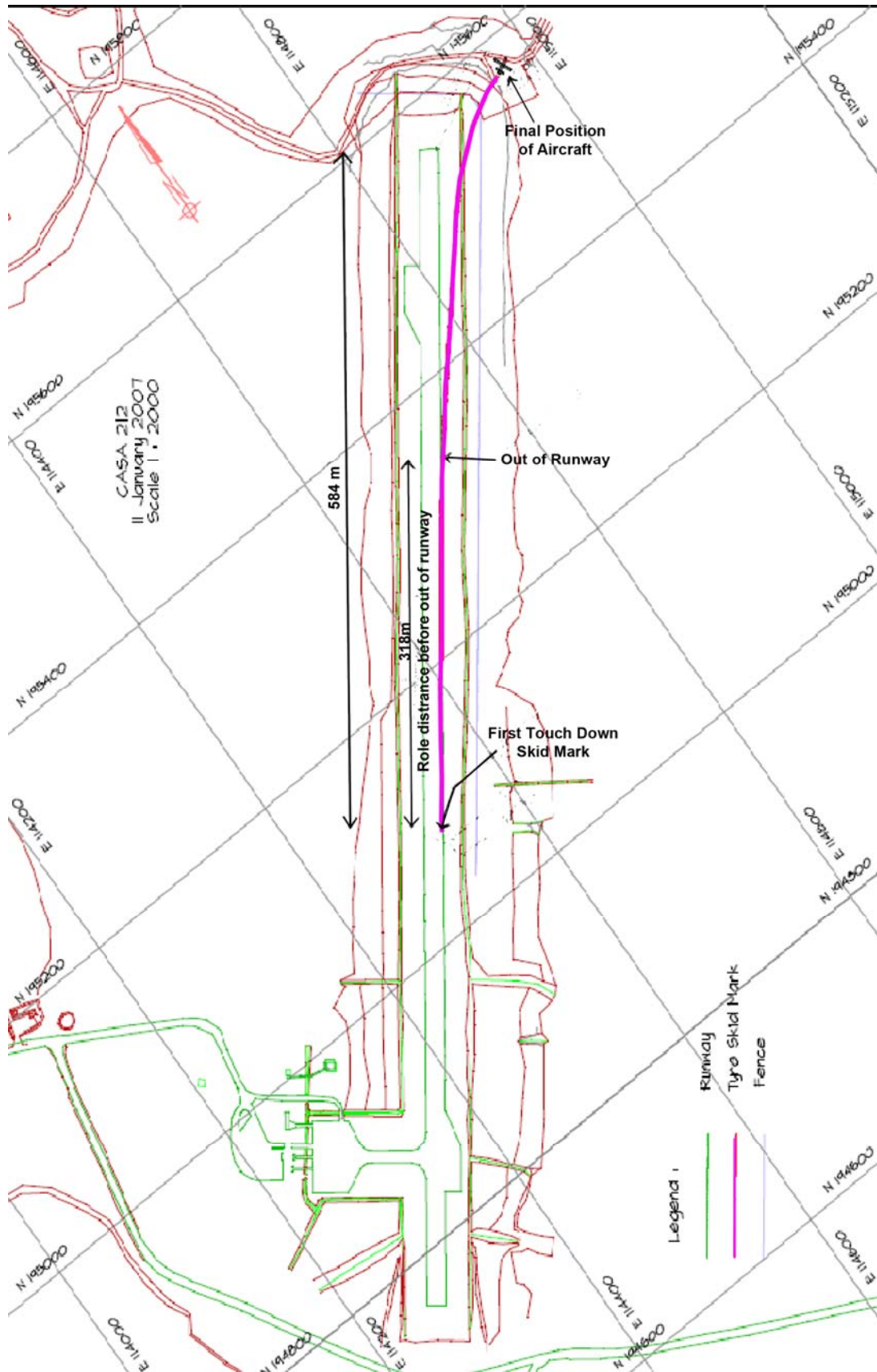


Figure 4: Sketch of the accident location for PK-BRM (not to scale)

## **2 ANALYSIS**

The pilots' attention was diverted during the approach with the generator failure and fluctuating engine torque.

The investigation determined that the aircraft was not being flown on a stabilized approach and subsequently touched down to the right of the runway centerline. It then veered to the right of centerline after touchdown and the PIC's effort to bring the aircraft back to the runway centreline by using aileron was ineffective.

There was no evidence that visibility affecting visual acquisition of the runway was a factor. However, the investigation considered that a visual approach guidance system such as Visual Approach System Indication (VASI), may have provided additional visual cues to alert the pilots to the prevent the unstabilized approach.

### **3 CONCLUSION**

#### **3.1 Findings**

1. The pilots were appropriately licensed to operate the Casa 212 aircraft.
2. The pilot in command (PIC) flew the aircraft on an unstabilized approach.
3. The PIC did not maintain effective control of the aircraft after touch down
4. The aircraft veered to the right and ran off the runway into soft wet ground.
5. The PIC's efforts to regain directional control of the aircraft were not appropriate and control of the aircraft was not maintained.

#### **3.2 Causes**

1. The pilot in command (PIC) continued to land the aircraft from an unstabilized approach.
2. The PIC did not maintain effective and appropriate control of the aircraft on the ground.

## **4 RECOMMENDATIONS**

### **4.1 Recommendation to Aviastar Mandiri**

The National Transportation Safety Committee encourages the use of the Flight Safety Foundation (FSF) Approach-and-landing Accident Reduction (ALAR) and Controlled Flight Into Terrain (CFIT) awareness material and recommends that Aviastar Mandiri include ALAR and CFIT awareness modules in their recurrency training programs, and conduct initial ALAR and CFIT training for flight crew members who have not yet completed such training.

### **4.2 Recommendation to PT. Kalimantan Prima Coal**

The National Transportation Safety Committee encourages the airport operator, PT. Kalimantan Prima Coal (KPC), to improve the safety of operations at KPC Airport through the installation of a visual approach guidance system such as Visual Approach System Indication (VASI).