



## AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8805	
<b>Aircraft Registration</b>	ZS-NLY	<b>Date of Accident</b>	16 July 2010		<b>Time of Accident</b>	1715Z
<b>Type of Aircraft</b>	De Havilland Dash 8-300		<b>Type of Operation</b>	Domestic Scheduled Flight		
<b>Pilot-in-command Licence Type</b>		Airline Transport	<b>Age</b>	26	<b>Licence Valid</b>	Yes
<b>Pilot-in-command Flying Experience</b>		Total Flying Hours	4 575.4		Hours on Type	1 524.9
<b>Last point of departure</b>		O.R. Tambo International Aerodrome (FAJS)				
<b>Next point of intended landing</b>		Kimberley Aerodrome (FAKM)				
<b>Location of the accident site with reference to easily defined geographical points (GPS readings if possible)</b>						
On runway 20 at FAKM (GPS position; South 28° 48.545' East 024° 45.868' elevation 3 910 feet AMSL)						
<b>Meteorological Information</b>		Surface wind; 310°/2kt, Temperature; 3°C, Visibility; +10 km				
<b>Number of people on board</b>	2+2+40	<b>No. of people injured</b>	0	<b>No. of people killed</b>	0	
<b>Synopsis</b>						
<p>On 16 July 2010 at 1715Z flight SA1107, a de Havilland Dash 8 with registration ZS-NLY, collided with a wild animal (aardvark/anteater) shortly after touchdown on runway 20 at Kimberley aerodrome. The accident occurred at night. The impact was on the nose landing gear, which caused the nose gear to collapse backwards. The pilot managed to maintain runway heading and the aircraft came to rest approximately 1 200 m from the threshold of runway 02 on the centreline.</p> <p>Following shutdown, the passengers and crew members disembarked from the aircraft via the main access door located on the left front side of the aircraft. Aerodrome fire and rescue personnel responded swiftly, following the activation of the crash alarm by the air traffic controller (ATC) in the tower and managed to assist the passengers and crew. Nobody was injured in the accident. All the occupants were transported from the scene/runway to the main terminal building via vehicles.</p> <p>The aircraft was being operated under the provisions of Part 121 of the Civil Aviation Regulation of 1997 and had departed from O.R. Tambo International aerodrome at 1545Z. Visual meteorological conditions prevailed at the time of the accident flight, which was operated on an instrument flight rules flight plan.</p>						
<b>Probable Cause</b>						
<p>During landing, the nose landing gear of the aircraft collapsed backwards after it had collided with a wild animal on the runway.</p>						
<b>IARC Date</b>				<b>Release Date</b>		

## AIRCRAFT ACCIDENT REPORT

**Name of Owner** : South African Express Airways (Pty) Ltd  
**Name of Operator** : South African Express Airways (Pty) Ltd  
**Manufacturer** : De Havilland Incorporated  
**Model** : Dash 8-300  
**Nationality** : South African  
**Registration Marks** : ZS-NLY  
**Place** : Kimberley Aerodrome  
**Date** : 16 July 2010  
**Time** : 1715Z

*All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.*

### **Purpose of the Investigation:**

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability.***

### **Disclaimer:**

*This report is produced without prejudice to the rights of the CAA, which are reserved.*

## **1. FACTUAL INFORMATION**

### **1.1 History of Flight:**

1.1.1 On Friday afternoon, 16 July 2010, flight SA1107 departed from O.R. Tambo International aerodrome (FAJS) at 1545Z on a domestic scheduled flight to Kimberley aerodrome with four crew members and forty passengers on board. The aircraft was cleared for landing on runway 20 at Kimberley aerodrome. The prevailing weather conditions at the time were fine, with the wind reported as light and variable. During the approach the crew requested the air traffic controller (ATC) to turn up the runway light intensity as it was very dim, being night-time already.

1.1.2 According to the pilot-in-command (PIC), who was also the pilot flying (PF) this sector, the main landing gear touched down, with the nose gear still in the air, when he saw an aardvark in front of the aircraft. Less than a second later, the nose landing gear collided with the aardvark. Immediately thereafter the landing gear horn sounded and the PF attempted to hold the nose wheel off the runway for as long as possible. It was in this time period that a Mayday was broadcasted by the crew: *“Ah Kimberley, Expressways 107, mayday, mayday, mayday, we have got a nose gear collapsed after hitting an animal on the runway”*.

The nose of the aircraft was then lowered and eventually the aircraft’s nose made contact with the asphalt runway surface. After a few seconds, the aircraft started to veer to the right of the centre line. This situation was corrected by left brake input, to bring the aircraft back to centre line. At about this time the sparks started flying, more on the right side of the aircraft, than on the left, with the lower nose section scraping on the runway. The cockpit and cabin area then started to fill, with what initially looked like dust or smoke, but it had a very distinctive, acrid smell to it.

1.1.3 After the aircraft came to a halt on the runway, the first officer (FO) assessed the situation for any possible fire, and as there was no fire the FO then left the flight deck via the cockpit access door and he oversaw and assisted with the evacuation from the outside of the aircraft. The evacuation was conducted via the main access door, which was located on the front left side of the aircraft. The PF completed the shutdown checks as indicated in the aircraft’s (Dash 8) quick reference handbook (QRH) for a ground emergency, where after he also left the cockpit and assisted with the evacuation from the inside of the cabin. The passengers were requested to move upwind from the aircraft and to gather at a central point.

1.1.4 The ATC immediately activated the crash alarm after the crew had declared a Mayday. The aerodrome rescue and fire-fighting (ARFF) personnel responded by moving swiftly to the accident scene via the quick access road. As there was no fire, the ARFF personnel further assisted with the evacuation of the occupants.

1.1.5 Nobody on board the aircraft was injured in the accident and all the occupants were transported from the scene to the main terminal building by vehicle. The passengers’ hand luggage and checked-in luggage was then removed from the aircraft and delivered to the terminal building.

1.1.6 The accident occurred at night, at a geographical position determined to be South

28° 47.926' East 024° 45.907' at an elevation of 3 940 feet above mean sea level (AMSL).

## 1.2 Injuries to Persons:

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	2	2	40	-

## 1.3 Damage to Aircraft:

1.3.1 The aircraft sustained substantial damage to the nose landing gear and lower nose fuselage structure.



Figure 1. A view of the aircraft as it came to rest on the runway with the nose gear collapsed backwards.

## 1.4 Other Damage:

1.4.1 Apart from the animal that was killed during the impact sequence, no other damage was caused.

## 1.5 Personnel Information:

1.5.1 Pilot-in-command (PIC):

Nationality	South African	Gender	Male	Age	26
Licence No.	*****	Licence Type	Airline Transport		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument Rating, Flight Tests - Multi Engine Piston				
Medical Expiry Date	31 August 2010				
Restrictions	None				
Previous accident	None				

Flying Experience:

Total Hours	4 575.4
Total Past 90 Days	164.4
Total on Type Past 90 Days	164.4
Total on Type	1 524.9

1.5.2 First Officer (FO):

Nationality	South African	Gender	Male	Age	34
Licence No.	*****	Licence Type	Airline Transport		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument Rating, Instructor's Rating Grade 3, Flight Tests – Multi Engine Piston				
Medical Expiry Date	31 October 2010				
Restrictions	None				
Previous accident	None				

Flying Experience:

Total Hours	6 531.6
Total Past 90 Days	137.7
Total on Type Past 90 Days	87.5
Total on Type	1 269.7

1.5.3 Senior Cabin Attendant:

Nationality	South African	Gender	Female	Age	24
Licence No.	*****	Licence Type	Cabin Crew		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Held required ratings for aircraft type.				
Medical Expiry Date	31 March 2012				
Restrictions	None				
Previous accidents	None				

1.5.4 Second Cabin Attendant:

Nationality	South African	Gender	Female	Age	20
Licence No.	*****	Licence Type	Cabin Crew		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Held required ratings for aircraft type.				
Medical Expiry Date	30 September 2011				
Restrictions	None				
Previous accidents	None				

1.5.5 Air Traffic Controller (ATC)

Nationality	South African	Gender	Male	Age	32
Licence No.	*****	Licence Type	ATC		
Licence valid	Yes				
Ratings	Aerodrome				
Unit Ratings	None				
Medical Expiry Date	31 December 2010				
Restrictions	None				

1.6 Aircraft Information:

**Airframe:**

Type	De Havilland Dash 8-300
Serial Number	352
Manufacturer	De Havilland Incorporated
Year of Manufacture	1993
Total Airframe Hours (At time of Accident)	39 203:10

Last Inspection (Hours & Date)	39 166:16	11 July 2010
Hours since Last Inspection	36:54	
C of A (Issue Date)	12 May 2004	
C of A (Expiry Date)	11 May 2011	
C of R (Issue Date) (Present owner)	23 June 2003	
C of A Operating Categories	Standard Part 121	

\*NOTE: All aircraft/engine/propeller hours reflected in these columns as provided by the aircraft Operator/AMO.

### Engine No. 1:

Type	Pratt & Whitney 123E
Serial Number	PCE 123233
Hours since New	35 455:31
Hours since Overhaul	13 080:14

### Engine No. 2:

Type	Pratt & Whitney 123E
Serial Number	PCE 123228
Hours since New	35 669:45
Hours since Overhaul	7 140:09

### Propeller No. 1:

Type	Hamilton Standard 14SF-23
Serial Number	MFG 920815R
Hours since New	13 502:41
Hours since Overhaul	3 028:01

### Propeller No. 2:

Type	Hamilton Standard 14SF-23
Serial Number	MFG 960125
Hours since New	25 362:29
Hours since Overhaul	6 222:35

## 1.7 Meteorological Information:

1.7.1 An official weather report was obtained from the South African Weather Services (SAWS), which provided the following weather conditions for FAKM on 16 July 2010 at 1700Z.

Wind direction	310°	Wind speed	2 knots	Visibility	+ 10km
Temperature	3°C	No. clouds	Nil	Cloud base	Nil
Dew point	-7°C				

## 1.8 Aids to Navigation:

1.8.1 The aircraft was equipped with the following navigational aids:

- Magnetic compass
- Automatic Direction Finder (ADF)
- Very high frequency omni-directional radio range (VOR)
- Distance Measuring Equipment (DME)
- Instrument Landing System (ILS)
- Global Positioning System (GPS)
- Transponder
- Weather Radar.

All navigational aids on board the aircraft as well as the ground aids at FAKM were serviceable at the time of the accident.

## 1.9 Communications:

1.9.1 External Communication:

The aircraft was in radio contact with the Kimberley control tower on the VHF frequency 118.2 MHz. The aircraft was cleared for the VOR/DME approach on runway 20.

According to the Air Traffic Controller (ATC) the pilot broadcasted a Mayday call after the aircraft's nose landing gear had collapsed, indicating that they had hit an



animal on the runway. A short while later the crew also reported smoke in the cockpit. The ATC then activated the crash alarm, whereupon the ARFF personnel responded to the accident scene.

#### 1.9.2 Aerodrome Rescue and Fire-Fighting (ARFF) Communication:

Following the activation of the crash alarm by the ATC, he was immediately contacted by the ARFF station on the active aerodrome frequency to clarify the reason for the activation of the crash alarm. The ATC responded *“You may proceed to the aircraft; it is at the end of the runway, 4 plus 40 passengers on board. The Dash 8 had hit an animal on the runway and they have reported smoke in the cockpit”*.

The ARFF unit responded promptly by moving to the location of the aircraft, which came to rest on runway 20. Quick access to the location of the aircraft was made possible via a special emergency (quick) access road that had been constructed from the apron area to the intersection of both runways. The first ARFF response vehicle estimated their response time to be less than one minute from the time when the crash alarm was activated until they arrived at the scene. This was within the three-minute time frame as called for in ICAO Annex 14, Volume 1. There was no fire to attend to and their primary task shifted to assisting the occupants and securing/stabilising the accident site.

This was in line with the air traffic management requirements as stipulated in ICAO doc 4444, Chapter 7, paragraph 7.1.2.1, page 7-2.

A transcript of the communication can be found attached to this report as Annexure A.

#### 1.9.3 Runway Closure - NOTAM

Immediately following the accident, a NOTAM (notice to airmen) was issued by the appropriate authorities (indicated below) notifying all aviators that runway 02/20 at FAKM was closed.

*“JKM140 161826  
GG FAKMTZX FAKMTCT  
161826 FAJNYYX  
(C1741/10 NOTAM*

Q) FAJA/QMRLC/IV/NBO/000/999/2848SQ2446E005

A) FAKM B) 1007161826 C) 1007181000 EST

E) RWY 20/02 CLSD, DUE TO BLOCKING OF THE RWY.)”

## 1.10 Aerodrome Information:

### 1.10.1 Aerodrome Details:

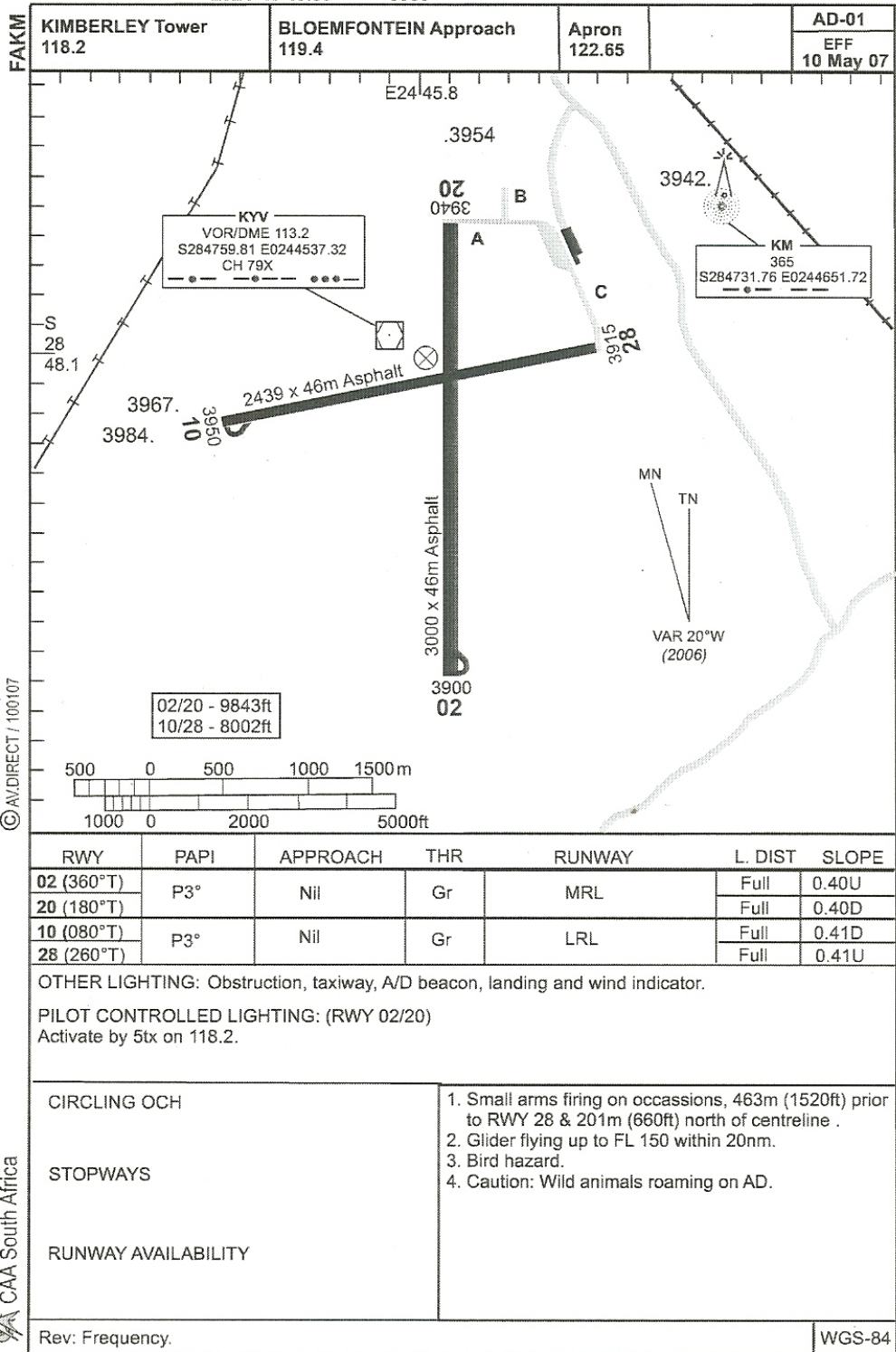
Aerodrome Location	3 nm South of Kimberley	
Aerodrome Co-ordinates	South 28° 48'06.29" East 024° 45'48.85"	
Aerodrome Elevation	3 950 feet above mean sea level (AMSL)	
Runway Designations	02/20	10/28
Runway Dimensions	3 000 x 46 m	2 439 x 46 m
Runway Used	20	
Threshold Elevation	3 940 feet AMSL	
Runway Slope	Downslope of - 0.4%	
Runway Grooved	No	
Runway Surface	Asphalt	
Approach Facilities	VOR, DME, NDB, Runway lights, PAPIs	
Aerodrome Status	Licensed	
License Validity	1 September 2009 to 31 August 2010	

#### Note:

The ICAO reference code number and letter for FAKM was 4C and related to the critical aircraft characteristics for which the FAKM facilities make provision. (i.e., Canadian Regional Jet 200/700, Dash 8-300/Q400 type aircraft). The aerodrome reference code table to which reference is made is contained in ICAO Annex 14, Volume 1, paragraph 1.7.

# Aerodrome Chart for Kimberley

AERODROME CHART
S28°48'06.29" ELEV 3950
E024°45'48.85"
KIMBERLEY



## 1.11 Flight Recorders:

### 1.11.1 Cockpit Voice Recorder

The cockpit voice recorder (CVR) was recovered from the accident aircraft. The CVR was a Fairchild Model A100A, part number 93-A100-80 and serial number 60867. An external examination of the CVR revealed that overall it was in a good condition. The underwater locator beacon (ULB) or pinger was undamaged.



Figure 2. A view of the cockpit voice recorder recovered from the aircraft.

### 1.11.2 Flight Data Recorder

The aircraft was equipped with a Honeywell solid state flight data recorder part number 980-4100DXUN, serial number 7423. The unit was undamaged and there was no apparent impact damage to the ULB, which remained attached to its bracket. The unit showed no signs of external damage.



Figure 3. A view of the flight data recorder recovered from the aircraft.

Neither of these units was downloaded by the investigator following the accident, as the information was expected not to be of benefit to the investigation.

## 1.12 Wreckage and Impact Information:

1.12.1 The aircraft was cleared for landing at runway 20. The nose landing gear of the aircraft was still in the air (main gear had touchdown) when a wild animal collided with the nose gear on the centreline of the runway, 621 m past the threshold. The animal, which was killed in the accident, was found on the runway, 38 m past the point of impact to the right of the centre line.

The pilot managed to keep the nose of the aircraft up for a further 479 m past the point of impact. Although both nose wheel tyres were found to be deflated, there was a clear blowout on the right nose wheel tyre some 400 m past the point where the nose gear had first made contact with the runway surface. Fourteen (14) m past the tyre blowout marking, both nose gear doors started making contact with the runway surface, followed by the nose gear strut assembly some 186 m further on. The aircraft came to a halt on the runway centre line 1 838 m past the threshold of runway 20.



**Figure 4.** A view of the nose gear strut assembly and the gear doors scraping on the runway.



**Figure 5.** Final position of the aircraft as it came to rest on the runway centre line.

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

1.13.1 Not Applicable.

### **1.14 Fire:**

1.14.1 There was no evidence of a pre- or post-impact fire.

1.14.2 The crew reported smoke in the cockpit following the nose gear collapse. The smoke was believed to have originated from the nose wheel tyres that deflated during the nose gear collapse and as they skidded along the runway surface they generated smoke. The nose gear strut assembly as well as the nose gear doors (both sides) were found to have skidded along the runway surface for a considerable distance.

1.14.3 The ARFF at Kimberley aerodrome responded promptly to the scene of the accident, following the activation of the crash alarm by the ATC and they arrived at the scene within the three-minute time frame as recommended by ICAO Annex 14. There was no fire to extinguish and they assisted the passengers from the aircraft to a demarcated area and then secured and stabilised the accident site.

## **1.15 Survival Aspects:**

### 1.15.1 General:

The passenger load comprised four crew members and forty passengers. The dynamic loads generated in this occurrence were within the range of human tolerance and none of the forty-four (44) occupants on board sustained any injuries associated with the impact. All the passengers were wearing their aircraft-equipped lap straps. The two cabin crew members were located at their different stations/seats, one in front of the aircraft looking aft and one in the rear of the aircraft looking forward. They were both strapped in at the time of landing.

### 1.15.2 Cockpit:

The accident was survivable as the cockpit and cabin area remained intact. The cockpit crew were wearing their four-point safety harnesses. The cockpit did not sustain any deformation to the floor structure following the collapse of the nose landing gear.

## **1.16 Tests and Research:**

1.16.1 None considered necessary.

## **1.17 Organisational and Management Information:**

1.17.1 The operator was in possession of a valid domestic Air Service licence. No. N399D  
The category aircraft listed under this licence was A1 and A2. The operator was also in possession of a valid Air Operating Certificate (AOC) that was issued by the regulating authority on 15 September 2009, with the expiry date indicated as 27 September 2010.

1.17.2 The aircraft was maintained by an approved aircraft maintenance organisation (AMO). The AMO was in possession of a valid AMO Approval Certificate that had been renewed by the regulating authority on 1 October 2009 in terms of the Civil Aviation Regulations, 1997, as amended. The expiry date on the certificate was 30 September 2010.

1.17.3 Kimberley aerodrome was in possession of a valid Aerodrome Licence No. 1007 that had been issued by the regulating authority on 31 August 2009 and was valid for a period of one year.

## **1.18 Additional Information:**

### 1.18.1 ICAO Annex 14, Volume 1, Chapter 9 (Wildlife strike hazard reduction)

*“Note. — The presence of wildlife (birds and animals) on and in the aerodrome vicinity poses a serious threat to aircraft operational safety.*

*9.4.1 The wildlife strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:*

*a) the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;*

*b) the collection of information from aircraft operators, aerodrome personnel and other sources on the presence of wildlife on or around the aerodrome constituting a potential hazard to aircraft operations; and*

*c) an ongoing evaluation of the wildlife hazard by competent personnel.*

*9.4.2 Wildlife strike reports shall be collected and forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database.*

*Note. — The IBIS is designed to collect and disseminate information on wildlife strikes to aircraft. Information on the system is included in the Manual on the ICAO Bird Strike Information System (IBIS) (Doc 9332).*

*9.4.3 Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft.*

*Note. — Guidance on effective measures for establishing whether or not wildlife, on or near an aerodrome, constitute a potential hazard to aircraft operations, and on methods for discouraging their presence, is given in the Airport Services Manual (Doc 9137), Part 3.*



9.4.4 *The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicates that they are unlikely to create conditions conducive to a wildlife hazard problem. Where the elimination of existing sites is not possible, the appropriate authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.*

9.4.5 **Recommendation.** — *States should give due consideration to aviation safety concerns related to land developments in the vicinity of the aerodrome that may attract wildlife”.*

**NOTE:** *The requirements of ICAO Annex 14 are incorporated verbatim in CARs.*

#### 1.18.2 ICAO Annex 14, Volume 1, Chapter 9 (Fencing):

*“9.10.1 A fence or other suitable barrier shall be provided on an aerodrome to prevent the entrance to the movement area of animals large enough to be a hazard to aircraft.*

*9.10.2 A fence or other suitable barrier shall be provided on an aerodrome to deter the inadvertent or premeditated access of an unauthorized person onto a non-public area of the aerodrome.*

*Note 1. — This is intended to include the barring of sewers, ducts, tunnels, etc., where necessary to prevent access.*

*Note 2. — Special measures may be required to prevent the access of an unauthorized person to runways or taxiways which overpass public roads.*

*9.10.3 Suitable means of protection shall be provided to deter the inadvertent or premeditated access of unauthorized persons into ground installations and facilities essential for the safety of civil aviation located off the aerodrome”.*

#### 1.18.3 Civil Aviation Regulation provides that;

*“Part 139.02.8 (Establishment of aerodrome environment management programme):*

*The applicant shall, in the area within its authority and where any bird and wildlife presents or is likely to present a hazard to aircraft operating to or from the aerodrome, establish an aerodrome environment management programme to minimise the effects of such hazard or potential hazard, taking due cognisance of the provisions of the environment Conservation Act, 1989 (Act No. 73 of 1989), and the regulations made thereunder.*

*Part 139.02.19 (General duties of holder of an aerodrome licence)*

*(2) The holder of the licence shall ensure that –*

- (a) the aerodrome is maintained in a serviceable condition;*
- (b) the aerodrome is kept free of unauthorised persons, vehicles or animals not under proper control, in compliance with the Civil Aviation Offences Act, 1972, and the regulations made thereunder;*

*Part 139.02.23 (Maintenance of aerodrome environment management programme)*

*The holder of an aerodrome licence shall –*

- (a) maintain the aerodrome environment management programme referred to in Regulation 139.02.8; and*
- (b) operate the aerodrome in accordance with the provisions of the Environment Conservation Act, 1989, and the regulations made thereunder, together with the recommendations and requirements prescribed in any relevant Specifications or Codes of Practice published under the Standards Act, 1993 (Act No. 29 of 1993).*

*Part 139.02.24 (Aerodrome inspection programme)*

*The holder of an aerodrome licence shall establish and maintain an aerodrome inspection programme, including –*

- (a) procedures to ensure that competent aerodrome personnel execute the programme effectively; and*
- (b) a reporting system to ensure prompt correction of unsafe aerodrome conditions noted during any inspection, to ensure compliance with the regulations in this subpart”.*

#### 1.18.4 Aerodrome Operations Manual (March 2007)

The following information was extracted from the aerodrome licence holder operations manual (on record at the CAA, active manual at the time of the accident) pertaining to wildlife hazard management:

*“10. Wildlife Hazard Management (CARs Part 139.02.8)*

*(a) The arrangement for assessing any bird hazard:*

*The ACSA Fire and Rescue Services personnel patrol the airfield on a daily basis to record bird presence and abundance information which is then captured on an electronic database for analysis and interpretation of bird strike risks. The bird presence and abundance information is then shared with stakeholders at the monthly airport bird and wildlife committee meetings. Information logged onto the database is checked for accuracy by a specialist from the Endangered Wildlife Trust before a consolidation risk evaluation report is forwarded to the aerodrome. The aerodrome has an active bird and wildlife committee that meets on a monthly basis and involves all relevant aerodrome departments, airline managers and relevant external interest groups such as the Endangered Wildlife Trust.*

*(b) The arrangement for the removal of any bird hazard:*

*The airfield at FAKM is patrolled on a regular basis by the ACSA Fire and Rescue Services to scare birds away. Other methods include grass-cutting techniques to discourage the presence of bird species that present a high risk.*

*(c) The name and role of the person responsible for dealing with a bird hazard, and the telephone numbers for contacting this person during and after working hours:*

*ACSA Fire and Rescue Services*

*Refer to Appendix E for contact details”.*

#### 1.18.5 Aerodrome Runway and Taxiway Inspections:

ARFF personnel members conduct aerodrome inspections during their respective shifts, and for each inspection they complete a ‘runway and taxiway inspection form - FRS 001’ (Form reference No. C020 001M).

During the period from 12 to 16 July 2010, several wildlife sightings were made at the aerodrome during some of these inspections. These inspections were performed during the day and night. It was noted that the majority of these sightings were during dusk or at night.

The table below lists some of the sightings that were recorded by ARFF personnel. All times listed in the column were as recorded on the inspection form (local time).

<b>Date</b>	<b>Time of Inspection</b>	<b>Remarks</b>
12 July 2010	18h39 to 19h15	3 x Rabbits, 1 x Aardvark
13 July 2010	18h40 to 19h20	No birds/wildlife seen
14 July 2010	19h05 to 19h39	2 x Rabbits, 3 x Jackal, 1 x Aardvark
15 July 2010	18h30 to 19h01	1 x Steenbok
16 July 2010	18h38 to 19h10	2 x Rabbits

Source: Airports Company of South Africa (ACSA), Runway and Taxiway Inspection Forms FAKM.

On the early evening of 14 July 2010, during runway and taxiway inspection, an aardvark was sighted by the inspection team (consisting of two people) near the threshold of runway 28. One of the members got out of the vehicle, armed with a shotgun and two rounds of AAA ammunition. He fired both shots at the animal but it ran away into the grass-covered area next to the runway and was not seen again. The inspection team did not proceed to follow the animal by foot or by vehicle as it was dark, increasing the risk of an incident and/or injury.

#### 1.18.6 Aerodrome Perimeter Fence:

As part of the investigation process the aerodrome perimeter fence was inspected by the investigator-in-charge (IIC) on Saturday, 17 July 2010, the day after the accident. He was accompanied by a senior aerodrome official during the inspection. It was noted that several holes, which differed in size, were found dug underneath the fence along the perimeter. Most of these holes had been repaired during previous maintenance intervention; however, these repairs appeared to be temporary in nature and had entailed covering the holes with concrete blocks, rocks, stones and sand. This method was found to have had very little or no effect in stopping certain wildlife from migrating from one side of the fence to the other side (aerodrome side), as most of the holes were found dug open again after being 'temporarily closed-up' by aerodrome maintenance personnel. During a consultation with the aerodrome management it was determined that aerodrome maintenance personnel only work normal office hours from Monday to Friday. All

repairs to the perimeter fence fell under their portfolio, and with them not being on duty over weekends and public holidays, no maintenance intervention took place on the fence over weekends when required. The photos below reflect the observations that were made less than 24 hours after the accident occurred.



**Figure 6.** A general view of the aerodrome perimeter fence, consisting of wire meshing.



**Figure 7.** A section of the fence where concrete blocks were used to restrict animal access.



**Figure 8.** A substantial hole that was previously closed up and then dug open again.



**Figure 9.** A substantial hole that was previously closed up and then dug open again.



**Figure 10.** A substantial hole that was previously closed up and then dug open again.

Many wild animals had been sighted on the aerodrome property over a period of time, which included different species of antelope, jackal, rabbits, aardvark and many others. The movement of wildlife was found to be slightly more problematic on the western side of the aerodrome, where the aerodrome borders on a nature reserve. It was also in this area where the aerodrome licence holder attempted to restrict animal access by installing an electric fence. However, the solar panel that was installed to provide the electrical current for the fence was reported as stolen on 22 June 2010. At the time of the accident, the solar panel had not been replaced, which rendered this section of the fence inactive/disabled.



**Figure 11.** The solar panel was located in the designated area behind the electric fence.

It was noted that one of the perimeter fence access gates had a solid platform that consisted of concrete blocks. This practice was however, isolated to this gate only. See photo below.



**Figure 12.** Access gate within the perimeter fence with solid concrete foundation.

### 1.18.7 Aerodrome Property:

During an inspection of the aerodrome property it became apparent that hundreds of termite mounds were located on the property. According to a senior aerodrome official they had had a programme in place to try to address this issue, whereby they physically broke down the mounds and filled it with poison; however, this programme ceased some time ago. A substantial number of these mounds were observed in the area around the runways. With termites being the staple diet of an animal like the aardvark/anteater, the animals most probably found their way onto the aerodrome property by digging holes underneath the fence to feed on the food supply available. The photos on the next page display the environment before the grass was burnt and the second photo after the grass was burnt on the north-western part of the aerodrome property.



**Figure 13.** A general view of the aerodrome property with runway 02/20 in the background.

At the time of the accident, the grass on the aerodrome property between the runways was approximately 0.5 m in height. As a result most of the termite mounds were hardly visible, even if a person was in close proximity to them. This acted as ideal camouflage/shelter for wild animals and birds that might have roamed the aerodrome property.

The photo illustrated in figure 14 (on the next page) was taken on 5 August 2010. The area visible in the photo was located to the north-western part of the aerodrome, to the left of runway 10 and to the right of runway 20 (with reference to the aerodrome chart). The aircraft visible on the photo was positioned on runway



10.

Following the accident in question the aerodrome licence holder started with a process to burn the grass next to the runways and taxiways in order to identify the termite mound problem and initiate remedial action. The area depicted in the photo was burned a few days prior to the photo was taken, which was on 5 August 2010. The investigating team was informed that this was an ongoing process at the aerodrome in order to improve the visibility in the areas around the taxiways and runways, which would allow for better inspections with special emphasis on the sightings of birds and wildlife in close proximity to the runways and taxiways.

At the time the investigating team visited the aerodrome again, being 5 August 2010 several of the areas were still not subjected to any burning (still grass covered). It could however, be seen from the photo that there was indeed a serious termite mound population within the boundaries of the aerodrome property. It was noted during the visit in question that the aerodrome licence holder had indeed commence with a program whereby they had obtained the services of a contractor to start demolish these termite mounds by making use of earth moving equipment.



**Figure 14.** A view of the termite mounds located on the north-western side of the aerodrome.

During the inspection of the aerodrome property, many animal holes/shelters of different sizes were observed. Most of the holes appeared to be new/recent and active in nature. These holes provided ideal shelter for several animal species, including the aardvark.



**Figure 15.** The photo displays one of many animal holes/shelters on the aerodrome property.

#### 1.18.8 Daily Perimeter Fence Patrols:

##### 1. Aerodrome Security Personnel

The aerodrome licence holder had a designated perimeter fence inspection form on which all inspections were recorded. It was noted that on certain days these inspections were performed more than once by aerodrome security personnel. The designated form consisted of several columns that allowed for remarks/comments to be entered on the last column. During the period from 1 to 25 July 2010 the words “Animal holes” were recorded in the remarks/comments column on a daily basis, except for the 23<sup>rd</sup> of July 2010 when the column was left blank. The form, however, did not provide an option or a column to record any corrective actions that might have followed as a result of these findings. It was therefore not possible for the investigating team to obtain any documented evidence as to what actions followed as a result of these remarks/comments. The verbal response received indicated that whenever “animal holes” were reported, aerodrome maintenance personnel would be notified and they then had to perform corrective action in order to rectify the problem. This was found to work well during normal operational hours from Monday to Friday, but over weekends when these inspections and remarks continued, there was no corrective action forthcoming. This was due to the fact that the aerodrome maintenance personnel did not work over weekends, with the result that no actions were taken in response to these remarks/comments until personnel reported for duty on Monday mornings.

## 2. External Security Company

The inspections that were performed by security personnel from the aerodrome licence holder were supplemented by an external service provider (private security company) on a daily basis. However, the trip logbook or “inspection form” utilized by the service provider did not allow for any remarks/comments, nor any corrective actions that might follow from these inspections, which renders the form of no value to the investigation as it lack pertinent information/content (i.e., remarks/comments and corrective actions).

1.18.9 ICAO Doc 9137 Part 3 read in conjunction with Doc 9332 provides an immense amount of information on how to manage bird life at aerodromes, but does not provide any guidance material on wildlife management as a holistic approach towards aerodrome/aviation safety.

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

1.19.1 None.

## **2. ANALYSIS**

2.1 There are three primary reasons why birds/animals/wildlife would gain access to an aerodrome:

1. Availability of food, and/or
2. Availability of water, and/or
3. Availability of shelter.

2.1.1 In the case of Kimberley aerodrome the environment provided an ideal habitat for certain birds and wild animals, with the three basic needs to survive being met on the aerodrome property. The property contained hundreds of termite mounds, which provided the staple diet of the aardvark/anteater, and was therefore an ideal environment for these animals as well as several others.

2.1.2 The aerodrome perimeter fence consisted of wire mesh and was supported by wooden and steel poles along its entire path. Apart from the support poles being

secured by concrete, there was no foundation or embedded obstruction between these support poles to prevent animals like the aardvark and several other animals from digging holes underneath the fence in order to migrate from one side of the fence (aerodrome property) to the other side. The area of the fence that appeared to be the most problematic as far as animal migration (holes underneath the fence) was concerned, was to the western side of the aerodrome, which borders on a nature reserve that was owned by a mining company. During an inspection of the aerodrome property, several aardvark holes as well as those of other animals were found, with some of these holes appearing to be very recent (fresh). On 22 June 2010 the solar panel that had been utilized to electrify the electric fence on the western side of the aerodrome was stolen. The result was that this section of the fence was electrically disabled, and therefore it did not function in the way that it was intended to, which was to restrict animal movement in the area. It was further noted that over weekends no maintenance personnel were on duty at the aerodrome to perform maintenance-related repairs to the perimeter fence (should it be required), including closing up of holes that were found dug underneath the fence. Even though aerodrome perimeter fence patrols were conducted several times a day (day and night) and these observations were being logged (animal holes) on an approved inspection report, the holes would not be closed up until aerodrome maintenance personnel arrived at work on Monday morning, which was a concern, both from a safety as well as a security perspective. It was further noted that although certain holes were temporarily closed up by making use of stones, rocks, concrete blocks and sand, the same holes would be dug open again, which rendered maintenance intervention/repairs of no value. The licence holder was aware of the fact that the aerodrome perimeter fence was unable to restrict the movement of wild animals, but had allowed the status quo (latent hazard) to prevail, with the two occurrences dated 16 July 2010 and 3 August 2010 respectively being the result of these actions.

2.1.3 The migration of wild animals (excluding birds) to and from the aerodrome property is something that has been with the aerodrome for some time and is not a new phenomenon. Several species of wildlife were sighted at this facility over a period of time, and in some instances attempts were made to chase or frighten them away, but this approach appeared to be fruitless as these animals would run or fly away and hide for a brief period and then return again. In most instances wild animals would take evasive action by running into the grass or holes in close proximity to the runway. It was highly unlikely that these animals even left the aerodrome property. An animal like an aardvark as well as several other species make use of holes in the ground for shelter and therefore once chased or threatened by humans

or other predators would simply hide in these holes for some time and once the situation had normalised would proceed to roam the area again. The natural threat to these animals while on the aerodrome property was very little to none, as there were no natural predators apart from humans, vehicles and aircraft that posed any threat to them whatsoever.

2.1.4 Aerodrome rescue and fire-fighting personnel conducted several runway and taxiway inspections daily, and the only method for them to frighten these animals away was by physically chasing them away or by shooting at them with a shotgun. Once the animal ran into the grass or open area next to the runway, ARFF personnel did not proceed to follow these animals as the risk of being injured by stepping into a hole or damaging the vehicle was simply too high, especially at night. In the case of FAKM, ARFF personnel utilized the methods discussed above; no other proactive intervention had been put in place at the time by aerodrome management to address the risk of wild animals roaming the aerodrome property. On the evening of 14 July 2010 an ARFF member fired two shots with a shotgun at an aardvark that they observed next to the runway. This action had no effect on the animal and it just ran off into the grass and was left to continue to roam the aerodrome property. The lack of adequate action by the aerodrome licence holder had substantial safety implications towards aviation safety.

2.1.5 The section in the approved aerodrome operations manual pertaining to wildlife management contained very little to no information on how the aerodrome licence holder should have managed the wildlife programme at FAKM. The information contained in the manual appeared generic in nature and emphasised birdlife management and not wildlife management. The presence of wildlife at this aerodrome appeared slightly more problematic than at some of the other licensed aerodromes in the country, as regular sightings of wildlife were being recorded at the aerodrome, especially during dusk/night-time. However, very little to no proactive intervention was forthcoming in this regard from the licence holder and the status quo was allowed to prevail until the accident in question and a second occurrence eighteen (18) days later, also involving an aardvark.

2.2 The PF (pilot flying) briefly, for a split second, observed the animal in the landing light beam in front of the aircraft on the runway. The pilot was committed to the landing (main gear was already on the runway) and was unable to avoid the accident. After the impact with the nose gear, the pilot managed to keep the nose wheel from the runway surface for as long as possible. Once the nose assembly made contact with the runway surface, the aircraft started veering to the right of the

centreline but the pilot managed to control the situation with differential braking and steered the aircraft back to the centreline.

2.2.1 Once the crew had established that there was no fire on board the aircraft, they followed company procedures according to which the first officer exited the cockpit, opened the main access door and assisted the cabin crew with the evacuation procedure. ARFF personnel responded swiftly and assisted. All the occupants disembarked from the aircraft unassisted and were taken to the main terminal building.

2.3 Being night-time, as opposed to daylight conditions, the ATC had no clear vision of the runway. He was therefore not in a position to observe the animal on the runway prior to clearing the aircraft for landing. It should be kept in mind that these animals move fast and can enter the runway surface at any time, which once again emphasises the fact that a proper and active wildlife management programme should be implemented and managed to prevent occurrences of this nature.

### **3. CONCLUSION**

#### **3.1 Findings**

##### Crew

3.1.1 The pilot-in-command was the holder of a valid airline transport pilot's licence and he had the aircraft type endorsed in his logbook.

3.1.2 The pilot-in-command was the holder of a valid aviation medical certificate that had been issued by an approved CAA medical examiner.

3.1.3 Following the collision with the animal on the runway, the pilot flying broadcasted a Mayday call on the aerodrome tower frequency.

3.1.4 The first officer was the holder of a valid airline transport pilot's licence and he had the aircraft type endorsed in his logbook.

3.1.5 The first officer was the holder of a valid aviation medical certificate that had been issued by an approved CAA medical examiner.

3.1.6 The two cabin crew members were properly licensed and had the aircraft type endorsed on their licences.

#### Air Traffic Control

3.1.7 The air traffic controller was in possession of a valid aerodrome controller's licence at the time of the accident.

3.1.8 Following the Mayday from the crew of the aircraft, the ATC immediately activated the crash alarm.

#### Aircraft

3.1.9 The aircraft was properly maintained and had a valid Certificate of Airworthiness.

3.1.10 The Maintenance Release for the aircraft was valid and no technical fault was found with the aircraft during the investigation.

3.1.11 The nose landing gear collapsed following collision with an aarvark on the runway, which caused substantial damage to the aircraft.

#### Weather

3.1.12 Fine weather prevailed at the time of the accident, and was not considered to have had any bearing on the accident.

#### Operations

3.1.13 The aircraft was being operated under the provisions of Part 121 of the Civil Aviation Regulation of 1997 as amended.

3.1.14 No one on board the aircraft was injured in the accident and all the occupants disembarked from the aircraft via the main access door.

#### Rescue and Fire-fighting personnel

3.1.15 ARFF units responded swiftly by going to the scene of the accident following the activation of the crash alarm by the ATC.

3.1.16 Although the crew reported smoke in the cockpit, the ARFF personnel did not find a

fire to extinguish once they arrived on the scene.

3.1.17 All runway and taxiway inspections at the aerodrome were conducted by ARFF personnel and for each inspection an approved form had been completed.

### Aerodrome

3.1.18 The aerodrome was in possession of a valid aerodrome licence that had been issued by the regulating authority on 31 August 2009 for a period of one year.

3.1.19 During the week of 12-16 July 2010, several wildlife animal sightings (excluding birds) were made by ARFF personnel at the aerodrome, including two sightings of aardvark on the evening of 12 and 14 July 2010 respectively. On the evening of 14 July 2010, two shots were fired at an aardvark by one of the ARFF personnel, however, the animal ran into the grass-covered area next to the runway.

3.1.20 A perimeter fence inspection the day after the accident revealed several holes, dug underneath the fence. Temporary repairs were found to have been performed on a number of these holes in order to close them, but they were found to be dug open again.

3.1.21 A certain section of the perimeter fence used to be electrified, however it was found that the electrical supply to the fence had been disabled due to the fact that the solar panel that powered the fence was reportedly stolen on 22 June 2010.

3.1.22 The grass between the runways was found to be approximately 0.5 m in height, which allowed for good camouflage for certain species of wildlife on the aerodrome property.

3.1.23 Hundreds of termite mounds were located on the aerodrome property, which provided the staple diet of the aardvark.

3.1.24 Several animal holes were found on the aerodrome property, which provided shelter for many different species of animals, including the aardvark.

3.1.25 The section in the aerodrome operations manual dealing with wildlife management was found to lack content, as it focused on bird activity and not wildlife management as a holistic programme.



3.1.26 The list of responsible personnel allocated to the wildlife management programme contained in the aerodrome operations manual of FAKM, was found to be outdated.

3.1.27 The aerodrome perimeter inspection forms (both from the aerodrome licence holder as well as the private service provider) were found to lack content and indications of corrective actions subsequent to such remarks/observations, if any.

3.1.28 Aerodrome license holder was fully aware of the threat posed by the wild life but did not implement adequate measures to reduce the risks.

#### Regulating Authority

3.1.29 Part 139 of the CARs and supporting documentation in the form of technical standards (SA-CATS-AH) were found to lack content and guidance material with regard to wildlife management.

#### International Civil Aviation Organisation (ICAO)

3.1.30 ICAO Doc 9137 Part 3 was found to lack content and guidance material on the subject of wildlife management. The document contains a substantial amount of information on birdlife management, but very little to none on wildlife management as a holistic programme.

### **3.2 Probable Cause/s:**

3.2.1 During landing the nose landing gear of the aircraft collapsed backwards after it had collided with a wild animal on the runway.

### **3.3 Contributory Factor/s:**

3.3.1 The aerodrome fence had been constructed without a proper foundation, which allowed animals to dig holes and trenches underneath the fence in order to gain access to the aerodrome property, thereby easily migrating from one side of the fence to the other.

3.3.2 The fact that a section of the perimeter fence that used to be electrified was disabled due to theft of the solar panel powering the fence, was considered to be a significant contributory factor in the migration of animals along the fence.

- 3.3.3 An aardvark and other types of animals were spotted on the aerodrome by ARFF personnel during their runway and taxiway inspections over the period of 12 to 16 July 2010. However, no corrective measures were taken by the aerodrome licence holder to address this shortcoming (i.e., setting traps to catch these animals or bring in professional wildlife capturing teams to catch and relocate these animals).
- 3.3.4 The open areas between the runways and taxiways were found to consist mainly of savanna-type grassland. The grass was found to be approximately 0.5 m in height, which acted as a good camouflage for several species of animals, making it difficult to observe and track these animals, especially at night.
- 3.3.5 The fact that aerodrome maintenance personnel members were not on duty over weekends to ensure that the integrity of the perimeter fence had not been jeopardised and if so, to take corrective actions by closing all possible holes/trenches dug underneath the perimeter fence, was considered to be a significant contributory factor to this accident.

#### **4. SAFETY RECOMMENDATIONS**

4.1 It is recommended that the Director of Civil Aviation, in the interests of aviation safety, consider the implementation of the following safety recommendations.

- (1) That the SACAA Aerodrome Safety Department, as well as the Aviation Security Division, institute an immediate corrective action plan to address the aerodrome perimeter fence at FAKM. The investigation revealed that the aerodrome lacked adequate safety oversight in this regard.
- (2) That the following be considered in order to minimize the risk of wild animals (and possible perpetrators) entering the aerodrome boundary.
  - (i) The regulating authority to inspect the aerodrome perimeter fence and give guidance to the license holder whereby the fence should be upgraded to an acceptable risk level.
  - (ii) That the grass on the aerodrome be cut short and maintained accordingly in order for ARFF personnel to conduct proper aerodrome

inspections, with special reference to animals/wild life roaming on the aerodrome. Should it be required, the appropriate action can then be taken to minimise the risk for landing aircraft. Proper grass maintenance will also reduce bird activity at the aerodrome, as grass is common vegetation on an aerodrome.

- 4.2 That the aerodrome licence holder, in collaboration with Nature Conservation and the Endangered Wildlife Trust, engage on a proactive programme to manage the termite problem at FAKM.
- 4.3 That night operations at the aerodrome are restricted until the aerodrome licence holder has implemented a corrective action plan in accordance with the wildlife animal management programme.
- 4.4 During the investigation it was noted that the approved Aerodrome Operations Manual on record with the SACAA was last updated on 29 March 2007. It is recommended that an updated/amended copy of the Aerodrome Operations Manual be placed on record with the regulating authority.

The manual on record under the heading Wildlife Hazard Management (WHM) programme referred the reader to Appendix E of the manual, which contains the contact list of those responsible for dealing with the WHM programme. The contact list was found to be outdated and the content under the heading primarily addresses the issue of birdlife, and very little to no information in the manual contains any details or programme with reference to other types of animal management on the aerodrome. The short description on WHM in the manual was found to be of very little to no value in understanding the programme and how it should be managed. It is recommended that the manual should clearly indicate what the role and responsibilities are of each and every person as well as the external role players involved in such a programme with their up to date contact details.

- 4.5 It is recommended that the aerodrome licence holder should amend the form "ACSA Logbook for Daily Perimeter Fence Patrol" with immediate effect, as it was found to be lacking information. It is recommended that an additional column be added to the form indicating/reflecting the 'corrective actions' that were taken following the remarks/comments column. It was noted under the column 'remarks/comments' that the same observation was entered on a daily basis;

“Animal Holes”, however, the form does not indicate what corrective actions were taken to rectify the problems noted during these inspections.

- 4.6 That the aerodrome licence holder should have a designated wildlife control officer, who should head the wildlife control committee. This person should be schooled in the field to deal with issues from an environmental perspective.

ICAO Doc 9137-AN/901, Part 3 provides guidance material on how the bird control and reduction programme should be managed, and is supported by ICAO Doc 9332-AN/909, Manual on the ICAO Bird Strike Information System (IBIS).

- 4.7 That the regulating authority should provide all stakeholders (aerodrome licence holders) with clear guidance material and information on what is expected of them with reference to a wildlife management programme. Neither the Civil Aviation Regulations (CARs) Part 139.08.2, nor the Technical Standard (SA-CATS-AH) provides proper guidance material on the issue of wildlife management.

- 4.8 That the regulating authority establish a designated office (desk/person) to manage and ensure compliance with regard to a wildlife management programme at all licensed aerodromes in South Africa. Such office/desk/person(s) should also ensure that a wildlife reporting database is developed and kept up to date by engaging with all industry stakeholders/role players. The primary function of such a data base should be to identify trends at aerodromes, and to implement corrective actions in order to minimize the risk associated with wildlife activity at such aerodromes.

- 4.9 That the regulating authority draft an official letter to the International Civil Aviation Authority (ICAO) with reference to the guidance material contained in ICAO Doc 9137 Part 3 read in conjunction with Doc 9332, with regard to wildlife management, recommending that ICAO Doc 9137 Part 3 be amended to incorporate such guidance material as a holistic approach towards aerodrome/aviation safety.

- 4.10 That the Division of Air Safety Infrastructure at SACAA increases its ad hoc surveillance inspections at aerodromes known to be prone to wildlife activity and ensures that all the required measures are being taken to eliminate the risk of wildlife posing a threat towards landing, departing and manoeuvring aircraft. (Special emphasis should be placed on the aerodrome perimeter fence as the use of physical barriers to prevent access can be a permanent solution to the wildlife

problem. If animals are not allowed to gain access to food, water or shelter they will be less likely to be a problem on the aerodrome property).

- 4.11 That the SACAA Division of Aviation Security increases its ad hoc/surveillance inspections at aerodromes known to be prone to wildlife activity. During the investigation process it was noted that some of the holes that animals dug underneath the perimeter fence were substantial in size and could easily be utilized by criminals to gain access to aerodrome property. This is seen as a serious security threat and should be treated as such.

## **5. APPENDICES**

- 5.1 Annexure A (Communication between the ATC at FAKM and the crew of ZS-NLY)  
5.2 Annexure B (Background on the Aardvark).

Report reviewed and amended by the Advisory Safety Panel 16 November 2010.

-END-

## ANNEXURE A

Transcript of communication between the air traffic controller (ATC) and the crew of the aircraft ZS-NLY, (flying under the call sign Expressways 107) on the Kimberley tower frequency 118.2 MHz.

For the purpose of the report the abbreviation EXY 107 was used for the accident aircraft.

Time	From	To	Message
17:08:23	EXY 107	ATC	Kimberley tower good evening Expressways 107 release by approach, field in site, request a visual approach.
17:08:25	ATC	EXY 107	Expressways 107, Kimberley tower good evening descend as required, report final approach runway 20.
17:08:27	EXY 107	ATC	.....descend as required call you final approach runway 20, Expressways 107.
17:08:29	ATC	EXY 107	Expressways 107.
17:09:53	EXY 107	ATC	Kimberley tower from Expressways 107 can you please turn up the runway light intensity for runway 20? (silence for a brief period) Okay thanks.
17:09:56	ATC	EXY 107	Copy that.
17:12:34	ATC	EXY 107	Expressways 107 runway 20 clear to land, surface wind light and variable.
17:12:36	EXY 107	ATC	Thank you runway 20 clear to land, Expressways 107.
17:14:46	FCP	ATC	Tower, Foxtrot Charlie Papa (FCP) we have completed runway and runway lights inspection, all runways and taxiways clean and serviceable, lights in working condition, back at the station, enjoy your evening.
17:14:50	ATC	FCP	Foxtrot charlie papa copied that, same to you man.
17:15:05	EXY 107	ATC	And Kimberley, Expressways 107 Mayday mayday mayday we have got a nose gear collapsed after hitting an animal on the runway.
17:15:09	ATC	EXY 107	Expressways 107 copied, emergency services alerted.
17:15:12	EXY 107	ATC	Emergency services are required and we got smoke in the cockpit and we are evacuating the passengers.
17:15:15	ATC	EXY 107	Expressways 107.

Transcript of the communication between air traffic controller (ATC) and the aerodrome rescue and fire-fighting (ARFF) crew (rescue vehicles) on the Kimberley tower frequency 118.2 MHz and telephone.

Time	From	To	Message
17:15:32	Rescue 1	ATC	Tower, Rescue 1.
17:15:34	ATC	Rescue 1	Rescue 1, Expressways 107 reported an emergency, proceed via the emergency lane, the aircraft is located at the end of the runway, 4 plus 40 passengers on board, standby for the fuel endurance.
17:15:44	ATC	Rescue 1	Standby man, I tried to press the crash alarm but I could not hear anything.
17:15:52	Rescue 1	ATC	No it is oraait.
17:15:58	Rescue 1	ATC	Tower, Rescue 1.
17:15:59	Rescue 1	ATC	Tower, Rescue 1.
17:16:09	ATC	Rescue 1	Rescue 1 copied, Expressways 107 reported an emergency, proceed via the emergency lane, the aircraft is located at the end of the runway, 4 plus 40 passengers on board, standby for the fuel endurance.
17:16:36	Rescue 1	ATC	Proceeding via the emergency road to the turning circle, Rescue 1.
17:17:01	ATC	Rescue 1	Rescue 1.
17:17:44	Rescue 1	ATC	Can you just confirm again the problem of the aircraft?
17:17:45	ATC	Rescue 1	Rescue 1 say again?
17:17:51	Rescue 1	ATC	Can you confirm problem of aircraft?
17:17:52	ATC	Rescue 1	The Dash 8 hit an animal on the runway and they say there is fire...., correction smoke in the cockpit.
17:19:09	Rescue 1	ATC	Proceeding, proceeding to the aircraft and will report complete.
17:19:11	ATC	Rescue 1	Rescue 1.

There was no further communication.

## ANNEXURE B

Background on the Aardvark/Anteater:

Reference: <http://en.wikipedia.org/wiki/Aardvark>

*Description:*

*“The aardvark could be regarded as a living fossil. It is vaguely pig-like in appearance. Its body is stout with an arched back and is sparsely covered with coarse hairs. The limbs are of moderate length. The front feet have lost the pollex (or ‘thumb’) – resulting in four toes – but the rear feet have all five toes. Each toe bears a large, robust nail which is somewhat flattened and shovel-like, and appears to be intermediate between the claw and a hoof. The ears are disproportionately long, and the tail is very thick at the base and gradually tapers. The greatly elongated head is set on a short, thick neck, and the end of the snout bears a disc, which houses the nostrils. The mouth is small and tabular, typical of species that feed on termites. The aardvark has a long, thin, snakelike tongue and elaborate structures supporting a keen sense of smell.*

*An aardvark’s weight is typically between 40 and 65 kg. An aardvark’s length is usually between 1 and 1.3 metres, and can reach lengths of 2.2 metres when its tail is taken into account. The aardvark’s coat is thin and the animal’s primary protection is its tough skin. The aardvark has been known to sleep in a recently excavated ant nest, which also serves as protection from its predators.*



Photo of an Aardvark (Anteater).



*Behaviour:*

*The aardvark is a medium size, burrowing, nocturnal mammal and is a solitary creature that feeds almost exclusively on ants and termites (formicivore); the only fruit eaten by aardvark is the aardvark cucumber. An aardvark emerges from its burrow in the late afternoon or shortly after sunset, and forages over a considerable home range encompassing 10 to 30 kilometres, swinging its long nose from side to side to pick up the scent of food. When a concentration of ants or termites is detected, the aardvark digs into it with its powerful front legs, keeping its long ears upright to listen for predators. It is an exceptionally fast digger, but otherwise moves fairly slowly. Its claws enable it to dig through the extremely hard crust of a termite or ant mound quickly, avoiding the dust by sealing the nostrils.*

*Aside from digging out ants and termites, the aardvark also excavates burrows in which to live: temporary sites are scattered around the home range as refuges, and a main burrow is used for breeding. Main burrows can be deep and extensive, have several entrances and can be as long as 13 metres.*

*Habitat*

*Aardvarks live in sub-Saharan Africa, where there is suitable habitat for them to live, such as savannas, grasslands, woodlands and bushland, and available food (i.e., ants and termites)".*

\*\*\*\*\*