



## **AIRCRAFT ACCIDENT REPORT**

**AIB/SAHCOL/2008/01/15/F**

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**Accident Investigation Bureau**

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**Report on the Serious Incident involving  
A BAGGAGE TRACTOR (DOUGLAS)  
Towing Tug NO. 55/2 and parked  
Aircraft B737-200 at D-43 Avio-bridge on the Ramp  
at Murtala Muhammed International Airport  
Ikeja, Lagos  
Nigeria  
On 15 January 2008**

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**AIB/SAHCOL/2008/10/15/F**

This report was produced by the Accident Investigation Bureau (AIB), Murtala Muhammed Airport, Ikeja, Lagos.

The report is based upon the investigation carried out by Accident Investigation Bureau, in accordance with Annex 13 to the Convention on International Civil Aviation, Nigerian Civil Aviation Act 2006, and Civil Aviation (Investigation of Air Accidents and Incidents) Regulations.

In accordance with Annex 13 to the Convention on International Civil Aviation, it is not the purpose of aircraft accident/serious incident investigations to apportion blame or liability.

Readers are advised that Accident Investigation Bureau investigates for the sole purpose of enhancing aviation safety. Consequently, Accident Investigation Bureau reports are confined to matters of safety significance and should not be used for any other purpose.

As the Bureau believes that safety information is of great value if it is passed on for the use of others, readers are encouraged to copy or reprint for further distribution, acknowledging Accident Investigation Bureau as the source.

Recommendations in this report are addressed to the regulatory Authorities of the state (NCAA). It is for this authority to decide what action is taken.

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## GLOSSARY OF ABBREVIATIONS USED IN THIS REPORT

ADA	Authority to drive at airside
AIB	Accident Investigation Bureau
ATC	Air Traffic Control
AVCM	Airside Vehicle Control Manual
CSO	Chief Security Officer
CVR	Cockpit Voice Recorder
FAAN	Federal Airport Authority of Nigeria
NCAA	Nigerian Civil Aviation Authority
NCAR	Nigerian Civil Aviation Regulation
ASM	Aviation Security Manual

**Aircraft Accident Report No:** (SAHCOL /2008/01/15/F)

**Registration:** F-GHXX (aircraft)  
SAHCOL 55/2 (tow tug)

**Place of Incident:** Murtala Muhammed Airport,  
Bay D43 of the International  
Terminal.

**Date and Time:** 15 January 2008 at 1200hrs.

*(All the times in this report are local time (equivalent to UTC + 1) unless otherwise stated)*

## **SYNOPSIS**

Accident Investigation Bureau (AIB) was notified of the incident at 1210hrs on the 15<sup>th</sup> of January 2008 and arrived Murtala Muhammed Airport, International Terminal, the scene of the incident at 1230hrs to commence investigation.

An equipment handler with the Skypower Aviation Handling Company Limited (SAHCOL) while driving the company's tow tug with registration No. SAHCOL 55/2 conveying baggage from the hall to the foot of the parked Bellview Airlines aircraft for loading rammed into the aircraft.

The handler lost control of the tow tug and ran into the stationary Bellview B737-200 aircraft destroying the radome.

The equipment driver was taken to the Air Force Base hospital where he was treated and discharged two hours later.

SAHCOL was incorporated as a subsidiary of former Nigeria Airways Limited in 1999. It commenced operation same year. The headquarters was located at Murtala Muhammed Airport,

International Cargo Terminal. The company's main activities were passenger and baggage handling at airports in Nigeria.

The investigation identified the following causal factor/contributory factors:

### **Causal Factor**

- Failure of the tow tug brake system.

### **Contributory Factors**

- The training received by the equipment handler to operate on the airside was inadequate.
- The tow tug driver lost concentration and control of the equipment while performing his task.

Four safety recommendations have been made and the operators response are found in the Appendix.

## 1.0 FACTUAL INFORMATION

### 1.1 History of the Incident:

On the 15<sup>th</sup> January, 2008 Bellview Airlines B737-200 registration F - GHXK was positioned at bay D-43 of Murtala Muhammed International Airport in preparation for a West Coast flight.

At 1145hrs an equipment handler with SAHCOL was driving a tow tug conveying baggage from the hall to the foot of the Bellview Aircraft for loading. The first set of baggage to the aircraft was conveyed on a dolly to the forward cargo hold while he returned to pick a chain of dollies containing cargo, which was dropped at the aft cargo hold. He decided to meet with the baggage handlers standing by the forward section of the aircraft to ask if there were baggage or cargo left. According to the tug driver, as he approached the front hold, he had a “BLACKOUT”, lost control and rammed into the stationary aircraft, destroying the radome.

### 1.2 Injuries to Persons:

Injuries	Crew	Passenger	Others
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor/None	Nil	Nil	1

### 1.3 Damage to Aircraft:

The aircraft was slightly damaged.

### 1.4 Other Damage:

The windscreen of the tow tug was shattered and a head light broken.



## 1.5 Personnel Information:

### Equipment Handler/Driver

Age:	29 years
Gender:	Male
Nationality:	Nigerian
Driver's Licence No:	AGL 17189415
Date of issue:	28 <sup>th</sup> May, 2006
Driver's Licence Validity:	08 <sup>th</sup> September, 2009
Category of Licence:	Class E (commercial)
Equipment Handler Licence:	Nil
Airside Permit:	Nil

The equipment handler joined the services of SAHCOL in October 2006 after which he attended a two-week initial training on how to drive trucks, motorised passenger steps and conveyor belt. However, one week was spent on training for general knowledge while the remaining week was spent on the ramp. Before joining the services of SAHCOL, he worked with Guinea Glass Company at Agbara Industrial Estate, Ogun State as an Industrial Attachee.

## 1.6 Aircraft Information:

Aircraft Registration:	F - GHXK
Type:	BOEING 737 - 2A1
Serial No.:	21599

Year of Manufacture:	1978	
Engines:	Pratt and Whitney	
Serial No.:	No. 1 702785	No. 2 649700
Total hours:	37490.06	71819.42
Cycles:	25128	67678

### 1.6.1 Baggage Tractor Information

Type:	Tow tug
Registration No.:	SAHCOL 55/2
Manufacturer:	Douglas Equipment Ltd., Village Road, Arle Cheltenham Gloucestershire, GL 51 OAB England.
Year:	February, 2003
Total time in use:	6657 Hours
Owner/Operator:	Skypower Aviation Handling Company Limited (SAHCOL), Murtala Muhammed Airport International Cargo Terminal, Lagos.

### 1.7 Meteorological Information:

Visibility was good and in daylight.

### 1.8 Aids to Navigation:

Not applicable.

## 1.9 Communications:

Domestic frequency (121.7Mhz) for communication with ground/tower control was not installed in the tow tug.

## 1.10 Aerodrome Information:

Not applicable

## 1.11 Flight Recorders:

Not applicable

## 1.12 Wreckage and Impact Information:

The lower part of the aircraft's radome was crushed as the tow tug rammed into it, exposing the weather radar antenna. The tow bar which was originally positioned perpendicular to the aircraft nose gear was turned beyond 90 degrees with its wheel inscribing an arc on the ramp's concrete surface. The torque links of the aircraft nose landing gear was rotated beyond the marked limit thereby breaking the turning locks as seen on the ground. The windscreen of the tow tug was shattered, upper right frame dented, and a headlight broken. One of the safety cones demarcating the safety zone of the aircraft was also displaced.



Fig.1 Tow tug damage to the lower Radome



Fig.2 Exposed portion of the lower radome with the tow bar that turned the nose wheel beyond its limit



Fig.3 Nose gear turned beyond 90° exceeding the turning limit

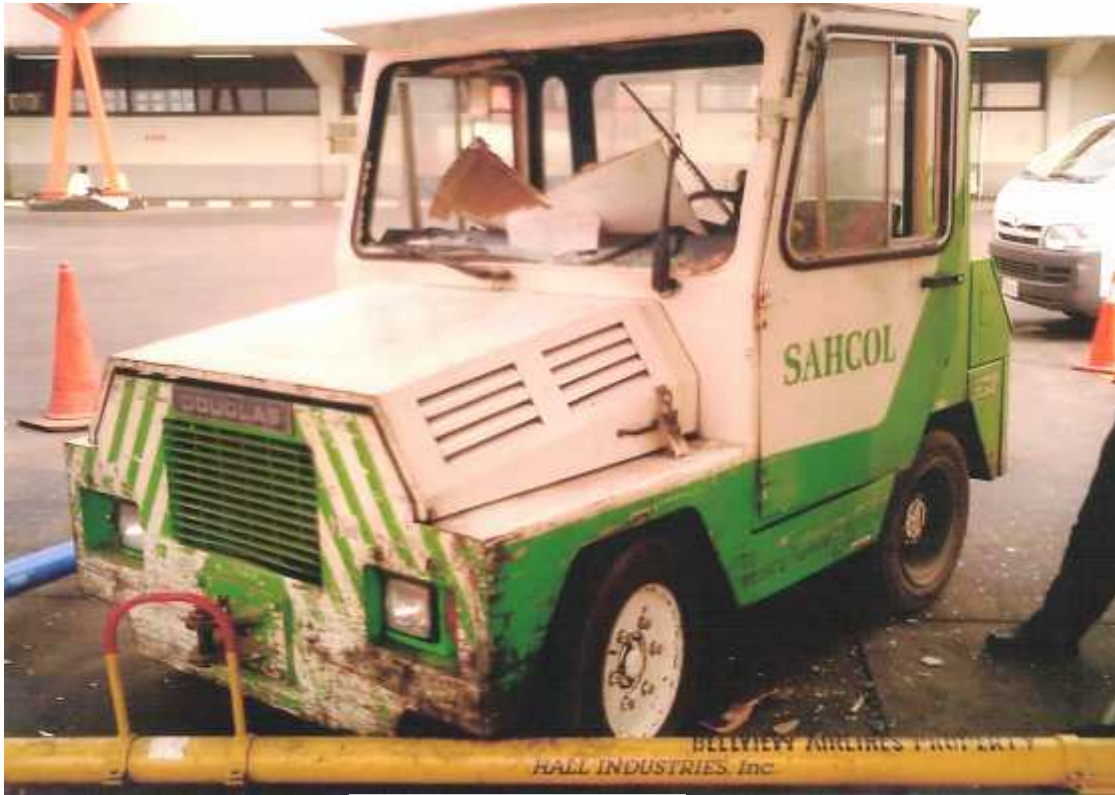


Fig. 4 The Tow Tug



Fig.5 Exposed weather radar antenna at the lower part of the radome



Fig.6 Shattered wind screen of the tow tug

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

The driver of the tow tug was taken to the Nigerian Air Force Base hospital where he was examined. The doctor's report confirmed that the driver was well oriented in time, place and position. He was equally cleared of alcohol and/or any substance of abuse.

#### **1.14 Fire:**

There was no fire outbreak.

#### **1.15 Survival Aspect:**

The incident was a survivable one as it occurred at a low speed and the damage to the tow tug was such that there was enough space for the driver to survive.

#### **1.16 Test and Research:**

The brake system of the tow tug was tested on the scene by competent personnel and was found to be defective.

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

- Aerodrome Operating Procedures and Safety Measures
- Airside Vehicle Control at Murtala Muhammed Airport

#### **NOTE:**

Procedures for the control of vehicles operating on the airside at Murtala Muhammed Airport are contained in the Airside Vehicle Control Manual (AVCM). This manual is issued by Federal Airports Authority of Nigeria (FAAN) as a separate document to those organizations and persons who need to operate vehicles at airside on a frequent basis and without escort.

The AVCM and its attachments detail the FAAN requirements and obligations in respect of vehicular activities on airside. Furthermore, the procedures stipulated in this manual comply with the requirements of Nigerian Civil Aviation Regulations (NCAR) 11.8 and 11.11.

## PURPOSE

The above sections detailed the arrangements in place at the airport for the control of vehicular movement on the airside.

MMA has further airside related responsibilities in respect of aviation security, duty of care under common law and obligations under workplace health and safety regulations.

## REFERENCES

*MMIA shall comply with NCAR Part 12 section 11.5 which requires the operator of an aerodrome to include in its manual, procedures for airside vehicle control. Additional specifications are contained in Aviation Security Manual (ASM) and other associated guidance materials.*

## RESPONSIBILITIES

***Airport Manager:*** *The Airport Manager, MMIA, has overall responsibility for implementing Airside Vehicle Control procedures at the airport. The Airport Manager is also responsible for:*

- *the approval of documentation designed to control vehicular activities on airside.*

***Head of Department (Airport Operations):*** *The HDD (Airport Operations) is responsible for:*

- *production and distribution of Airside Vehicle Control Manual, specifying the measures in place for the control of vehicles operating on airside.*
- *oversight of FAAN assessment of vehicles to be authorized for use on airside.*
- *oversight of FAAN driver training and examination activities*



- *conducting training and theory examinations for drivers needing to operate on airside*
- *carrying out physical testing of drivers needing to operate on airside.*

***Chief Security Officer:*** *The CSO is responsible for:*

- *implementing and maintaining a system for recording:*
  - *Details of audits conducted on airside driving,*
  - *Details of all authorities issued by MMIA for Vehicles to use airside,*
  - *All authorities issued by MMIA for drivers to operate on airside ensuring that all vehicles on the movement area comply with the NCAR on Airside Vehicle Control.*

***Airfield Services Officers:*** *Airfield services officers are responsible for:*

- *escorting drivers, who have a lawful reason to enter the airside, when:*
  - *the vehicle being driven has no formal authority to be used on airside*
  - *the driver of a vehicle (whether or not the vehicle has an appropriate authority to be used on airside) is not authorized to drive on airside.*
- *ensure that the requirements of NCAR in relation to the driving and use of vehicles on airside are complied with.*

## **GENERAL PRINCIPLES**

*FAAN as operator of the airport controls the entry to and from the airside, as well as the activities of all surface vehicles on airside.*

*Additionally, because the airport is subject to Air Traffic Control, vehicles are permitted on the maneuvering area of the airport (i.e. on taxiways and runways) only when specifically approved (given a clearance) by ATC. Furthermore, all drivers operating vehicles on a runway must turn their mobile phones off before entering the runway.*

*In exercising control of vehicles and drivers, MMIA has instituted procedures that involve Airfield Services Officers whose responsibilities include:*

- *assessing the need for individual vehicles and drivers to operate on airside without escort;*
- *checking, and approving the use of particular vehicles on airside;*
- *training, testing and authorizing individual drivers to drive on airside.*

*The procedure for the approval for a driver to operate a vehicle on airside and the issuing of a FAAN "Authority to Drive Airside" (ADA) is contained in the Airside Vehicle Control Manual. And ADA may be issued following satisfactory training and testing in one of four categories, namely:*

- *ADA Category 1 Perimeter Roads*
- *ADA Category 2 Category 1 plus Taxiways*
- *ADA Category 3 Category 2 plus Aprons*
- *ADA Category 4 Category 3 plus Runways*

### **AIRSIDE VEHICLE CONTROL MANUAL**

*The Murtala Muhammed International Airport "Airside Vehicle Control Manual" (AVCM) has been produced as MMIA management document, to control vehicle operations on the airside. It is maintained and distributed by the HOD (Airport Operations),*

*The Airside Vehicle Control Manual for drivers operating on Airside includes details of radio procedures to be used for certain categories of airside driving. The document itself is produced as a separate handbook for issuance to all airside drivers.*

#### **1.18 Additional Information:**

None

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

None

## 2.0 ANALYSIS

### 2.1 Personnel Training:

The training of SAHCOL equipment handlers was undertaken by a non-approved training organization. The training conducted for fresh equipment handlers, included induction, basic, and on-the-job training. The total training duration was two weeks and was administered by the company's Training Manager at the Federal Airports Authority of Nigeria (FAAN) training school. In addition to possessing a commercial driver's licence, equipment handlers should be trained on driving at the airside and observance of ramp safety practices.

### 2.2 Airside Operations:

Operating ground equipment at the airport's airside requires special training. Whenever the need arose to enter movement area, the equipment handler must communicate to the tower via a mobile radio. The equipment must have a rotating beacon. The speed limit is normally displayed and the conventional rule is for the driver to stay clear of an approaching aircraft. It was discovered that none of the SAHCOL equipment handlers was certified to operate on the movement area as required by AVCM.

### 2.3 Recruitment and Placement:

According to the driver, he got to know about the vacancy for the post of equipment handler through the advertisement which was pasted at the SAHCOL gate. He, being an HND holder in Electrical/Electronics Engineering, had great expectations of the job but seemed disappointed as time went on, hence he lamented thus:

*"I never knew that was the kind of work."*

However, to enhance job satisfaction, it is advisable to match personnel to the job followed by proper training.

## 2.4 Equipment Maintenance (Brake System)

The equipment is fitted with a pneumatic brake system. The six tests outlined in a typical brake system have been designed to discover the presence of air leaks and/or sluggish performance in air brake systems. The entire system, from the compressor through the line activator can easily be diagnosed in a short period of time by performing these tests.

After completion, it will be obvious whether or not the system is building pressure rapidly enough, if there is any leakage and if the emergency components are functioning properly. Each test is performed with a checklist.

However, there is a requirement for static test before the commencement of any operation on the ramp. The only check performed on the tow tug before the incident was mere driving the equipment forward and backward and applying brake to confirm its effectiveness. Nevertheless, this test carried out was not enough to detect any inherent malfunction of the brake system.

## 2.5 Preventing Aircraft Damage:

Although ramp Standard/Safety Operating Procedures stated the procedures for loading and unloading of baggage into an aircraft to avoid damage to the aircraft wall, doors and floors; damage also may result from exceeding floor weight limitations, inadequate tie-down, failure to fasten separation and door nets, improper opening or closing of doors, operating cargo doors during strong winds and using levering tools in the cargo hold.

However, the ramp Standard/Safety Operating Procedures did not put any procedure in place to ensure that the equipment handlers do not operate the equipment in such a manner as to damage an aircraft.

It is also stated in the SAHCOL Standard and Safety Practices Manual on section 4.5 that all vehicles, which must be driven very close to the aircraft must have marshaller maintaining visual contact with the vehicle driver and give all hand signals with precise actions. Despite the fact that these rules are stated in the Safety Practices Manual, it was poorly executed as seen in this incident.

## **2.6 Ramp Operation:**

The safety rules are stated in the Ramp Standard/Safety Operational Manual, but the practice on ground at the ramp, is not in compliance with the ramp safety rules in the Standard Safety Manual. There was no procedure for the enforcement of these rules, as the equipment handler operated the vehicle in the no-drive zone under the aircraft fuselage and wings. The surface markings at the ramp are not legible to indicate the ground equipment maneuvering areas as required in the Safety Practices Manual.

## 3.0 CONCLUSIONS

### 3.1 Findings:

- 3.1.1 It was discovered that the brake system of the tow tug was defective and inoperative.
- 3.1.2 Scheduled maintenance inspections have been carried out on the incident tow tug in accordance with the Manufacturer's Maintenance Manual.
- 3.1.3 The airport authority did not have procedures and mechanisms for monitoring of serviceability status and maintenance activities of SAHCOL and other cargo handling agencies operating at the airside.
- 3.1.4 The tow tug driver came into the employment of SAHCOL in October, 2006 having obtained a National driver's license on 28<sup>th</sup> September, 2006.
- 3.1.5 The tow tug driver was an HND holder in Electrical/Electronics Engineering.
- 3.1.6 The training usually given to newly employed equipment handlers comprises the induction, the basic and on-the-Job training and was usually carried out at Federal Airports Authority of Nigeria (FAAN) Training School by SAHCOL's Training Manager.
- 3.1.7 It takes one month training to qualify as an equipment handler.
- 3.1.8 SAHCOL had no Quality Assurance Manual.
- 3.1.9 SAHCOL did not install radio on their tow tugs.
- 3.1.10 The training of SAHCOL equipment handlers was being undertaken by an unapproved training organization.

3.1.11 The statement that the driver had a “*blackout*” was not corroborated as the medical examination showed that the driver was well oriented in time, place and position.

### 3.2 Causal Factor

- Failure of the tow tug brake system.

### 3.3 Contributory Factors

- The training received by the equipment handler to operate on the airside was inadequate.
- The tow tug driver lost concentration and control of the equipment while performing his task.

## **4.0 SAFETY RECOMMENDATIONS**

### **4.1 Safety Recommendation 2010 - 019**

Federal Airports Authority of Nigeria (FAAN) should implement the policy and procedure for monitoring the maintenance activities of vehicles and equipment used by ground handling operators. Quarterly and random checks should also be carried out on these vehicles and equipment.

### **4.2 Safety Recommendation 2010 - 020**

Federal Airports Authority of Nigeria (FAAN) should ensure that all equipment handlers and drivers are trained and certified on airside operations by accredited NCAA organization before being allowed to operate.

### **4.3 Safety Recommendation 2010 - 021**

Federal Airports Authority of Nigeria (FAAN) should consider the use of Breathalyzers to check the alcohol level of any suspected equipment handler operating or entering the airside/ramp.

### **4.4 Safety Recommendation 2010 - 022**

- a.** Federal Airports Authority of Nigeria (FAAN) should ensure the conduct of periodic safety audits and monitor safety trends to address weaknesses observed on all ground handling agencies operating on the airside.
- b.** Implement the procedures of the Airside Vehicle Control Manual.



## APPENDIX

### RESPONSES TO SAFETY RECOMMENDATIONS

#### Safety Recommendation 2010 -019

Federal Airports Authority of Nigeria (FAAN) should implement the policy and procedure for monitoring the maintenance activities of vehicles and equipment used by cargo handling operators. Quarterly and random checks should also be carried out on these vehicles and equipment.

#### Response to safety Recommendation 2010-019

The authority accepts this recommendation and has initiated implementation. *Federal Airports Authority of Nigeria has put in place a structure to monitor serviceability of vehicles and equipment deployed by cargo handling operators.*

#### Safety Recommendation 2010 - 020

Federal Airports Authority of Nigeria (FAAN) should ensure that all equipment handlers and drivers are trained and certificated on airside operations by accredited NCAA organization before being allowed to operate.

#### Response to Safety Recommendation 2010 - 020.

FAAN accepts this recommendation and implementation has commenced. *In line with the on-going airport certification, Federal Airports Authority of Nigeria has embarked on training and licensing of all Airside drivers. Total of 1,617 drivers have been trained, including all the stakeholder's drivers.*

*FAAN Airside Drivers' training programme which is endorsed by the Nigerian Civil Aviation Authority (NCAA) is in compliance with ICAO Annex 14 recommendation that an airport Safety programme be developed and training be provided to all individuals who operate vehicles and/or motorized equipment on the airside.*

## **Safety Recommendations 2010 -021**

Federal Airports Authority of Nigeria (FAAN) should consider the use of Breathalyzers to check the alcohol level of any suspected equipment handler operating or entering the airside/ramp.

## **Response to Safety Recommendation 2010 - 021**

FAAN accepts this recommendation.

*Arrangement is on to make a purchase of Breathalyzers by Federal Airports Authority of Nigerian.*

## **Safety Recommendation 2010 - 022**

- (a) Federal Airports Authority of Nigeria (FAAN) should ensure the conduct of periodic safety audits and monitor safety trends to address weaknesses observed on all ground handling agencies operating on the airside.
- (b) Implement the procedures of the Airside Vehicles Control Manual.

## **Response to Safety Recommendation 2010 - 022**

FAAN accepts this recommendation. *Periodic safety audits and monitoring are conducted regularly by Federal Airports Authority of Nigeria as a mandatory requirement for Safety Management System (SMS) and eventual certification of our airports.*