

الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY



Air Accident Investigation Sector

Incident

- Investigation Summary Report -

AAIS Case N°: AIFN/0012/2015

Aircraft Struck by Ground Vehicle

Operator:	Etihad Airways
Make and Model:	Airbus A320 - 232
Nationality and Registration:	The United Arab Emirates, A6-EIY
Place of Occurrence:	Abu Dhabi International Airport
State of Occurrence:	The United Arab Emirates
Date of Occurrence:	25 November 2015



Investigation Objective

This Investigation considers the aspects related to Etihad Airport Services Medical Hi Loader struck the Etihad Airbus Aircraft A320-232, registration A6-EIY, below R1 door during offloading, causing significant damage to aircraft fuselage.

This Report is adapted from the standard Final Report format depicted in the Appendix to *Annex 13 to the Convention International Civil Aviation*, for achieving the objective of this limited scope Investigation.

The sole objective of this Investigation is to prevent the reoccurrence of aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

Investigation Process

The occurrence was notified to Duty Investigator (DI) of the Air Accident Investigation Sector (AAIS) by phone call to the Hotline Number +971 50 641 4667.

After the Initial/On-Site Investigation phase, the occurrence was classified as an 'Incident'.

The scope of this Investigation is limited to the events leading up to this occurrence; no in-depth analyses of non-contributing factors were undertaken.

Notes:

- ¹ Whenever the following words are mentioned in this Report with the first letter Capitalized, it shall mean:
 - (Aircraft)- the aircraft involved in this incident
 - (Investigation)- the investigation into this incident
 - (Incident)- the incident that is the subject of this Summary Report.
 - (Report)- this investigation Summary Report.
- ² Unless otherwise mentioned, all times in this Report are given in 24-hour clock in Universal Time Coordinated (UTC), (UAE Local Time minus 4 hours).
- ³ Photos and associated images used in this Report are taken from different sources and are adjusted from the

original for the sole purpose of improving the clarity of the Report. Modifications to images used in this Report are limited to cropping, magnification, file compression, or enhancement of color, brightness, contrast or insertion of text boxes, arrows or lines.

Factual Information

History of the Incident

On 25 November 2015, an Etihad Airways Airbus A320-232 Aircraft, registration A6-EIY, operated flight number ETD 222 from Karachi, Jinnah International Airport (OPKC), Pakistan, to Abu Dhabi International Airport (OMAA), UAE, with a total of 92 persons onboard, comprising seven crewmembers and 85 passengers. The Aircraft arrived at OMAA at approximately 0645 LT, and was parked on stand 406.

After the Aircraft was chocked, and the engines were shutdown, various items of ground equipment were positioned to the Aircraft for passenger and crewmember disembarkation and for unloading of cargo.

During passenger disembarkation, a Medical Hi Loader (MHL) was being positioned to the Aircraft R1 door to disembark a sick passenger. The MHL struck the Aircraft in the area of the R1 door causing significant damage to the fuselage (figures 1 to 4).

At the time of the Incident, passenger disembarkation was in progress from the Aircraft left hand side, forward (L1) door. The passengers were disembarking using external passenger steps. All seven crewmembers and approximately 50 passengers were still onboard the Aircraft, whereas approximately 10 passengers were descending the stairs when the MHL struck the Aircraft.

The CCTV recordings at the time of the Incident showed that the MHL impacted the Aircraft violently, which resulted in a significant lateral movement of the Aircraft. The impact was felt by the crewmembers as well as by the passengers who were still onboard. Also, from the CCTV recording, some of the passengers who were on the stairs lost their balance, but none sustained injury. Disembarkation was temporarily stopped and continued again after the Aircraft was deemed safe.

The Aircraft was towed to the hangar for repair as the damage was beyond the *Structure Repair Manual (SRM)* limits. The MHL was withdrawn from service.

Shortly after the Incident, the MHL operator was relieved from duty and upon management request underwent drug and alcohol tests, which were conducted by an Operator's contracted organization.

The results of the drug and alcohol tests were negative.

The Duty Time and MHL Operation

On the day of the Incident, the rostered duty time of the MHL operator was from 0600 to 1600 LT, and he reported for duty at 0530 LT. This was his fourth consecutive morning shift.

During this shift, he was initially assigned the task of operating a passenger bus. At around 0630 LT, the line trainer informed the MHL operator that he had been reassigned to operate an MHL for this shift. The line trainer was also employed within the Etihad Airport Services (EAS) operations department with the title of bus driver, but he also acted in the capacity of supervisor.

During the Investigation interviews, the MHL operator stated that, when the line trainer informed him that he had been reassigned to operate an MHL for this shift, he informed the line trainer that he was not able to operate the MHL alone, and he required supervision by a senior operator. The line trainer responded by advising the MHL operator to call him on his mobile phone in case of any difficulties.

Thereafter, the line trainer brought the MHL operator to Stand 400, and he then proceeded to Stand 200 to oversee the training of another MHL operator.

The MHL operator, after completing all the required safety checks for the MHL that was parked at stand 400, waited for further instructions regarding his tasks.

After the Aircraft had arrived on Stand 406, the MHL operator was notified by the EAS engineering department to position the MHL at the Aircraft. By the time he reached Stand 406, the Aircraft had already parked and disembarkation of the passengers was in progress. The MHL operator arrived at Stand 406 at approximately 0655 LT and waited for a marshaller to assist in positioning the MHL to the Aircraft. He then requested a Passenger Service Agent (PSA) staff

member, whose primary duty was to assist wheel chair passengers and to marshal the MHL to the R1 door. The PSA staff member started to marshal the MHL towards the Aircraft door.

The MHL Operator stopped the MHL approximately 1.5 meters from the Aircraft. The MHL Operator continued the slow movement towards the Aircraft. As the MHL came close to the Aircraft, the Operator mistakenly depressed the accelerator pedal instead of the brake pedal. This resulted in a sudden acceleration causing the MHL to impact the Aircraft. The aircraft sustained damage (figures 1 to 4).

When The PSA staff member realized that the MHL was about to strike the aircraft, he shouted and gave a 'stop' signal without any response from MHL Operator. The PSA staff member moved away from the MHL to avoid injury to himself.

Damage to Aircraft

The damage to the Aircraft is shown in figures 1 to 4. The MHL collided with the aircraft resulting in one significant skin puncture (figure 3), as well as several dents below the R1 door (figure 4).



Figure 1. MHL collided with the Aircraft at R1 door

Personnel Information

The MHL operator

The MHL operator joined the EAS in July 2013 as a bus driver. He had worked for two years at Sharjah Sea Port as a heavy vehicle driver. He holds a valid UAE general driving license and a valid apron permit (ADP). Although, he successfully completed his theory as well as practical training for MHL rating (No. 15), at the

time of the Incident, his ADP had not been endorsed with the MHL rating.



Figure 2. MHL left hand side

as a marshaller, and that his colleagues were also involved in this practice.



Figure 3. Damage to fuselage – skin puncture

The MHL operator training

The MHL operator completed his practical training by EAS on 3 July 2015, and he was checked out by the EAS training department on 8 July 2015. He underwent refresher training on 24 November 2015 (one day before the Incident). Between 8 July and 24 November 2015 (138 days), the Operator had positioned the MHL to an aircraft on only one occasion. On that occasion, he drove the MHL without supervision. This was on 17 August 2015 and the MHL was marshalled by a senior driver. He reported back for duty after one-month annual leave on 22 November 2015. The day of the Incident was his fourth morning shift following his annual leave.

The MHL operator's two checkouts in July 2015 required operation and positioning of the MHL to a live aircraft in accordance with the EAS *Integrated Safety & Quality Management Manual, Chapter 4.9*. These tasks were completed satisfactorily by the MHL operator.

On the day of the Incident, the MHL operator felt physically fit and did not feel tired or fatigued prior to the incident.

The marshaller (Passenger Service Agent)

The marshaller was employed another company, working as a contractor to EAS, to assist the Passenger Service Agent. During his interview, he stated that he did not receive any training in airside safety or airside operations, including marshalling. His primary job responsibility was to assist wheelchair passengers.

The Passenger Service Agent operator stated that, this was not the first time that he had acted



Figure 4. Damage to fuselage – dents

Senior manager training

The senior manager training joined EAS on 4 January 2015. He was responsible for the training program, including the training syllabus, organizing a team of line trainers, training supervisors and training officers.

During his interview, the senior manager training stated that, the training syllabus was in line with The IATA Safety Audit of Ground Operations Standards (ISAGO), and covered all the relevant aspects of airside safety.



During May, June, and July 2015, almost 100 bus drivers were trained as MHL/MDL/LDL¹ operators. This practical training was conducted by trainers who did not work directly for the training department, but were nominated by the training department to carry out the training.

The senior manager training confirmed that the PSA personnel were not supposed to perform marshalling activities, as they were not trained for these tasks.

The training department was in the process of organizing a line trainer's team.

When the senior manager training was asked about the failure rate of the operators, he stated that it was about 20% on the first attempt. He was in the process of organizing a training team of supervisors and training officers to ensure that proper oversight was exercised by the EAS training department.

Meteorological Information

As per the weather report for Abu Dhabi International Airport at 0700 LT of 25 November 2015, the prevailing meteorological conditions were not a factor to this Incident.

Additional Information

Pedal differences between the Cobus Bus and the MHL

The MHL operator had limited experience in positioning the MHL to the aircraft in comparison with his experience in driving passenger buses. Comparing the two equipment, the distance between the brake and accelerator pedals of the Cobus 3000 buses was much less than the MHL 17-07 (figures 5 and 6). This difference between the bus and the MHL contributed to the MHL operator depressing the accelerator pedal instead of the brake pedal.

Interviews with ground equipment operators

The investigation held interviews with four experienced ground equipment operators who were not involved in the Incident and were authorized to operate buses and the MHL. The

four operators were of different nationalities and they were asked to provide feedback on aspects of the operation, such as safety reporting, shift patterns, training, workload and the condition of the ground support equipment (GSE).

Safety reporting

The operators were unaware of the process to be used to submit written reports to the EAS safety reporting system, instead of that the operators used to provide verbal reports of safety deficiencies to their management.

The EAS head of safety stated that safety occurrence reports must be raised by a supervisor. The operators can submit hazard reports, or confidential reports, in accordance with Section 2.7.3 of the EAS *Integrated Safety & Quality Management System Manual*.

Section 2.7.3 stated:

"Any staff may raise a Confidential Report to the safety team. There two ways of submitting the confidential report:

- 1) Staff may utilize the Ground Safety iReport form and drop it in the Safety Boxes strategically distributed in EAS facilities; or
- 2) Staff may complete a Ground Safety iReport form and send it to safety@eas.co.ae."

The EAS safety department had not received any hazard reports from GSE operators.

Shift patterns

All the interviewed operators conveyed their concern regarding the existing shift pattern which requires them to work approximately 60 hours per week. The operators voiced concern at the possible health effects due to working this roster.

It was established during the Investigation that the existing shift pattern was in compliance with the UAE *Labor Law* and was introduced after consultation with the EAS human resources. However, based on the inputs received from the operators and to minimise the associated health

¹ MHL/MDL/LDL: Medical/High Loader/Main Deck/Loader/Lower Deck Loader



and safety risks in this regard, the EAS management should review the shift patterns.

Overtime

The operators who confirmed that they were not under any pressure to work on their off days, nor were they forced by management to perform overtime duties.

Training

The operators stated that to operate and position an MHL to the aircraft is a complicated task. It requires reasonably rational skills and time and motion judgment and therefore only highly experienced operators should be assigned to this role.

The operators sometimes answer calls coming from supervisors while positioning the MHL to the aircraft. Operators can receive many calls from management during a single shift duty. The operators feel that not responding to a call may lead to them being punished.

Generally, the operators were satisfied with the airside and equipment training provided to them. However, none of them understood what was meant by the term 'safety management system'. They said that they had received no training related to the company's safety management system.

Condition of GSE

When asked about the condition of the equipment, all of the operators stated that MHL-2 and MHL-4 had multiple faults. There was a risk posed by using such equipment, especially when positioning to an aircraft. This applied particularly to inexperienced operators.

Job description

All of the operators stated that they had never seen their job descriptions, nor had they ever asked for them from management.

Service level agreement

The service level agreement (SLA) between Etihad Airport Services Ground (EASG) and Etihad Airways (August 2014), paragraph 4, reference 4.1– *Service Element Operational Readiness of GSE Standard*, stated that the appropriate GSE, in good operational condition, with trained personnel in full PPE and displaying proper security identification, are to be made available at the aircraft stand parking position five minutes prior to an aircraft estimated time of arrival. The GSE is to be docked with the aircraft

within three minutes of chocks on and engine shutdown.

Abu Dhabi Airports Company (ADAC)

ADAC issue and renew airport driving permits (ADP) for appropriate ramp personnel. ADAC also carries out Incident investigation and general safety oversight of activities on the ramp.

It is not required that personnel who are issued with an ADP possess a UAE driving license in the same category as the vehicle(s) that the person will drive on the ramp.

ADAC oversight

There was no SLA between ADAC and EAS. ADAC had published a separate procedure for each process. ADAC does not have a procedures manual.

Personnel employed to work on the ramp at Abu Dhabi international Airport may drive classifications of vehicles for which they do not possess a driver license.

No reference of UAE license classification versus ADP equipment category was available. There were adequate procedures for granting and renewal of ADP licenses (reference *ADA/ADIA/OPS/ASD/SA/SOP/101-V3.0/01092015*).

ADAC had no internal expertise in the operation of GSE equipment, however ADAC have authorized some EAS personnel to carry out training for operators. ADP license issuing and renewal is carried out after verification of documentary evidence provided to ADP and practical testing related to ramp safety rules and regulations.

Due to lack of expertise on GSE equipment, ADAC did not carry out any testing or validation of operator training standards. This is an area which ADAC plan to improve upon and will consider integrating it with their inspection and audit activities in future.

EAS SMS

EAS has an *Integrated Safety & Quality Management System Manual (IMS)* which describes the policies, systems, programs, processes, procedures and means that enable EAS to manage, supervise, and control the operations, and administer and implement the safety, quality and environment management system.

The *IMS* also defines the means by which EAS subsidiary ensures compliance with customer airlines' requirements to support safe aircraft operation.

The *IMS* also describes the framework established to ensure operations are conducted in compliance with the applicable UAE *Civil Aviation Regulations (CARs)*, especially Part X – *Safety Management System*, and in conformity with the relevant *Civil Aviation Advisory Publications (CAAPs)* issued by the General Civil Aviation Authority.



New Cobus 3000 Pedals.



Figure 5. Distance between the brake pedal and accelerator on the Cobus bus

The *IMS* contains Abu Dhabi Department of Transport EHSMS elements, mechanisms, code of practices. and customer airline requirements and procedures.

The *IMS* contains IATA standards and recommended practices i.e. ISAGO², AHM³, IGOM⁴, IATA *Dangerous Goods Manual*, IATA ULD⁵ Regulations, IATA *Perishable Cargo Manual*, etc.

Analysis

The MHL Operator Duty Time and MHL Operation

The MHL operator worked his normal rostered duty time and he was not suffering from tiredness, or fatigue.

The MHL operator's originally assigned task of bus driving was changed to require him to drive the MHL. The MHL operator felt that he lacked experience in driving this vehicle. He informed the line trainer that he wished to have a senior operator accompany him as he operates the MHL. The line trainer responded that the operator must drive the MHL, but if a problem arose the operator should contact the line trainer by phone.



Figure 6. Distance between the brake pedal and accelerator on the MHL

The Investigation believes that the MHL operator was not confident when he was positioning the MHL to the Aircraft and this led him to lose his concentration.

² ISAGO: IATA Safety Audit Ground Operations

³ AHM: Airport Handling Manual

⁴ IGOM: IATA Ground Operation Manual

⁵ ULD: Unit Loading Device



Service Level Agreement

The SLA between EAS and EASG contained no reference to operators' experience. The MHL operator had a low level of experience.

Training

The training records indicated that there was a gap of 139 days between the initial and refresher training of the MHL operator. During this time, the MHL operator had positioned the MHL to an aircraft on only one occasion. On that occasion, he was driving the MHL alone and being marshalled by a senior driver. This was on 17 August 2015.

The MHL operator's practical refresher training on the MHL was carried out without the use of an aircraft mock-up, or an actual aircraft. The operator's two checkouts in July 2015 required positioning of the MHL to 'live' aircraft, in accordance with the EAS *Integrated Safety & Quality Management Manual, Chapter 4.9*, which were duly completed by the MHL operator.

The refresher training, provided to the MHL operator was conducted by a trainer who was not nominated by the training department, but was tasked by EAS ground operations management to perform this 'informal' refresher training based on his record of good work performance.

The line trainer was not approved by the training department and had not gone through the process of instructor's evaluation as required under the procedures in Chapter 4 of the EAS *Integrated Safety & Quality Management Manual*.

It is quite likely that the delay between the initial training (03 Jul 2015), first aircraft operation (17th Aug 2015), and refresher training (24th Nov 2015), coupled with a lack of GSE-aircraft positioning practice, were key factors that contributed to the incident. Hence, EAS Ground Operations Management should re-assess the training requirements necessary to maintain currency on various classes of equipment.

Marshalling of the MHL

The PSA staff member, who volunteered to assist in marshalling the MHL, had received no airside safety or marshalling training. However, he perceived marshalling of vehicles as a 'normal' practice, since this task was routinely carried out by his colleagues and himself.

ADAC Oversight

ADAC issues and renews the ADP. The company investigates incidents and exercises general safety oversight as the airport operator. ADAC did not have internal expertise in the operation of GSE equipment, however, they have authorised certain personnel within EAS ground operations to conduct training of operators.

The issuing and renewal of ADPs is carried out after verification of documentary evidence provided to ADAC, and practical testing related to ramp safety rules and regulations. Due to lack of expertise in GSE equipment, they do not carry out any testing or validation of operator training standards.

Licensing of Ramp Equipment Operators

The Investigation noted that it is common for equipment operators to drive equipment for which they do not possess a UAE driving license of the correct classification. For instance, an operator may possess a license to drive a car on the road, but he is allowed to drive a bus, truck, or other heavy equipment on the ramp.

The issue of operators not having the correct classification of driving licence for the vehicles that they drive has significant safety, legal and insurance implications.

One of the requirements of ADAC, in order to issue an ADP, is that the applicant must have a UAE driving license, or its equivalent. There is no reference to the vehicle classification on UAE licenses.

Conclusions

General

The Incident was primarily the result of an organisational deficiency where an operator, who apparently met all the training requirements laid down by the company, lacked the required experience, recency and the confidence to operate the MHL independently. This led to a situation where the MHL operator, while positioning the equipment to the aircraft (while being marshalled by an unqualified individual) became nervous, lost control of the vehicle, and in an effort to stop, accidentally put his foot on the accelerator leading to a collision with the aircraft.



Findings

- (a) The Aircraft was certified, equipped and maintained in accordance with the existing requirements of the *Civil Aviation Regulations* of the United Arab Emirates.
- (b) ADAC issued ADP to the operators when they do not possess a UAE driving license of the correct classification.
- (c) The task for the MHL operator was changed from operating a passenger bus to MHL, which the operator lacked confidence in his ability to operate due to his lack of experience.
- (d) The line trainer did not pay sufficient attention to the Operators' request that a supervisor accompany him
- (e) Instead of assigning a supervisor to accompany the operator, the line trainer advised the MHL operator to contact him by phone if a problem arise. In the particular circumstances, this instruction did not address the MHL operator's legitimate concerns about his lack of experience.

Safety

Recommendations

The Air Accident Investigation Sector recommends that:

Abu Dhabi International Airport-

SR05/2017

Exercise oversight of the ground handling agents, including EAS, and ensure that the handling agents establish their own safety management systems.

SR06/2017

Ensure that the existing procedures for issuing ADPs is in accordance with a UAE driving license of the correct classification.

SR07/2017

Ensure that the handling agents risk-assess their loading and offloading procedures.

Etihad Airways-

SR08/2017

Ensure that appropriate safety risk assessment and reporting requirements are included in all contracts with ground handling agents.

This Report is issued by:

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