

Incident to the BOEING 737-900ER registered 4X-EHE

on 27 October 2019

at Paris-Charles de Gaulle (Val-d'Oise)

⁽¹⁾Except where
otherwise indicated,
times in this
report are local.

Time	22:47 ⁽¹⁾
Operator	El Al Israel Airlines Ltd.
Type of flight	Commercial air transport (passengers)
Persons on board	Captain, first officer, 5 cabin crew and 163 passengers
Consequences and damage	Flight cancelled, no damage
This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in November 2020. As accurate as the translation may be, the original text in French is the work of reference.	

Cargo fire warning before taxiing, use of fire extinguishers, and disembarkation of passengers

1 - HISTORY OF THE FLIGHT

Note: the following information is principally based on the flight data recorder (FDR), statements and examinations.

The crew were ready to carry out flight LY326 between Paris-Charles de Gaulle and Tel-Aviv (Israel). After the push-back from gate A38 of terminal 2A, the aeroplane was facing west on taxiway P1 with the engines operating while the tractor was uncoupled from the plane.



Source: Géoportail

Figure 1: Position of aeroplane during incident

⁽²⁾ Aircraft Rescue and Fire Fighting service.

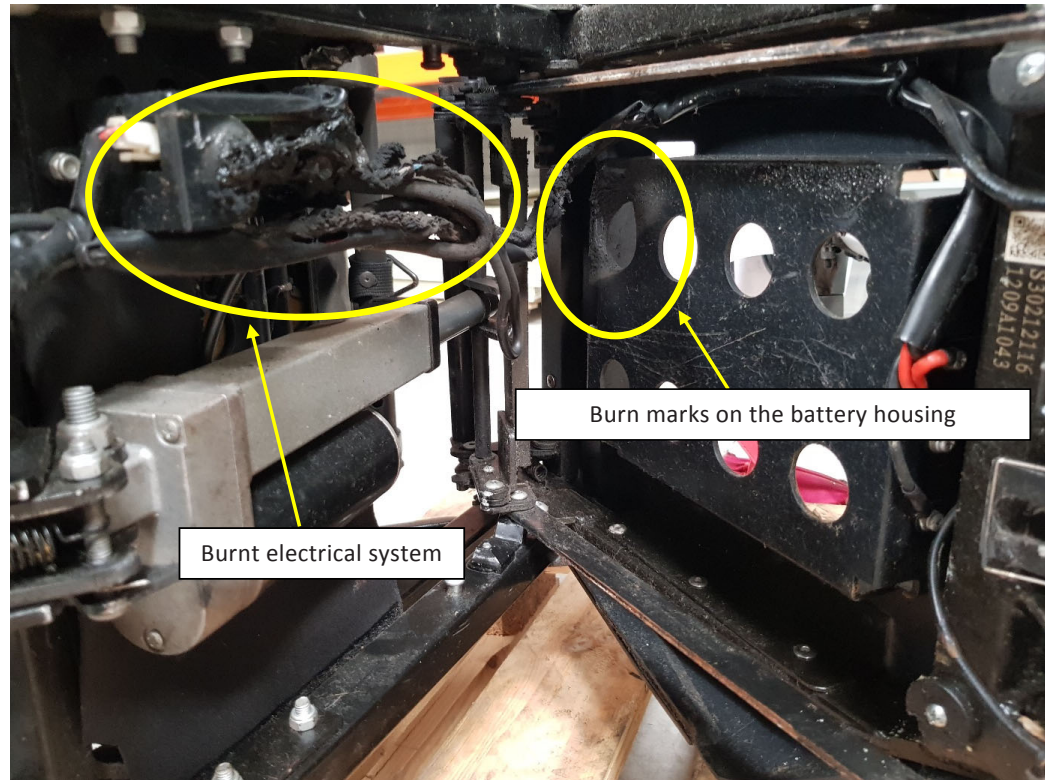
The pilots were on the point of asking for clearance to start taxiing when an “*AFT CARGO FIRE*” warning was activated in the cockpit indicating that there was a fire in the aft hold. The pilots complied with the corresponding procedure, operated the fire extinguishers and advised the controllers at 22:47 of an emergency situation. They asked the cabin crew to check that they could see no flames, smoke or heat coming from the cabin floor: the purser confirmed that no such phenomena were observed.

The ARFF⁽²⁾ arrived at the aeroplane at 22:49 and carried out an initial visual and thermal-camera inspection. They confirmed to the pilots that no flames or smoke were visible from the exterior.

After analysing the information available to him, the captain decided to start disembarking the passengers from where the aeroplane was situated, using steps at the front left door. The captain asked the cabin crew to stand ready to carry out an emergency evacuation should the situation change for the worse. During the evacuation of the passengers, the fire warning came on and off again. Towards the end of the evacuation, the cabin crew indicated that they could smell smoke in the cabin, but could not see it.

After all the passengers and crew members had exited the aeroplane, the ARFF opened the aft hold door: light smoke was observed but no sign of a fire could be seen. All the luggage was unloaded and inspected for signs of overheating or fire. There were heat marks on and a strong smell of burning emanating from a foldable electrical wheelchair belonging to one of the passengers. This wheelchair was equipped with a removable lithium battery.

The wheelchair was severely damaged, probably due to the electrical system overheating. The battery showed no obvious signs of damage except for a few external burn marks which corresponded to the openings in the battery housing. A red canvas pouch was attached to the chair's handles and exhibited burn marks. When the chair is in a vertical position, this pouch touches the battery.



Source: BEA

Figure 2: Position of battery housing in relation to burnt electrical system, wheelchair partially unfolded



Source: BEA

Figure 3: Burn marks on battery body, in relation to visible burn marks on housing



Source: Alysia

Figure 4: Red canvas pouch attached to wheelchair handle

Before the arrival of the BEA investigators, the wheelchair was handled and the battery put to one side, which meant that the position of the battery at the time of the incident and the content of the pouch were not known. However, observation of the damage on both the wheelchair and battery indicated that the latter had very probably been in its housing on the wheelchair.

After the incident, the aeroplane's electrical power supply had been kept on: the CVR⁽³⁾ had continued to operate and the recordings corresponding to the time of the incident were overwritten.

⁽³⁾ The CVR equipping the aeroplane has a recording time of two hours.

2 - ADDITIONAL INFORMATION

2.1 Regulations regarding the transport of mobility aids

The recommendations applicable to the air transport of mobility aids are described in the ICAO document No 9284⁽⁴⁾: *“Technical Instructions For The Safe Transport of Dangerous Goods by Air”*.

Most operators use the Dangerous Goods Regulation (DGR), published every year by IATA and based on these ICAO recommendations. The rules used by EL AL for the transport of dangerous goods are word-for-word the same as this regulation, with no modification to the case of mobility aids. They indicate that the transport of electrical wheelchairs equipped with removable lithium batteries is authorized under the following conditions:

- ☐ the operator must be advised of its presence;
- ☐ the battery must be removed by the passenger before the wheelchair is placed in the hold;
- ☐ the battery must be protected from impacts;
- ☐ the battery must be carried in the cabin by the passenger;
- ☐ the captain must be informed of the presence, number and location of the batteries.

⁽⁴⁾ International Civil Aviation Organization.

Part 1 - Chapter 4 of the DGR technical instructions deals with training obligations and stipulates in particular:

"Initial and recurrent dangerous goods training programmes must be established and maintained by or on behalf of:

[...]

b) operators;

c) ground handling agencies which perform, on behalf of the operator, the act of accepting, handling, loading, unloading, transferring or other processing of cargo or mail;

d) ground handling agencies located at an airport which perform, on behalf of the operator, the act of processing passengers;

Personnel must be trained in the requirements commensurate with their responsibilities."

The topics to be covered for each agent category are set out in this chapter.

2.2 Generalities concerning handling of passengers with reduced mobility on EL AL flights out of Paris-Charles de Gaulle

The handling of passengers with reduced mobility and their personal effects, from check-in to boarding, calls on various personnel.

The operator is responsible for checking in the passengers and handling their personal effects. At Paris-Charles de Gaulle, EL AL subcontracts this operation to Alysia.

The Alysia "check-in" service checks in passengers. In the case of a passenger with reduced mobility, the presence of a mobility aid is recorded electronically along with information about the type of battery that may equip the aid (number, technology, fixed or removable). This information is transmitted to the Alysia coordinator ("*traffic*" service) who reminds the passenger in the departure lounge that s/he must remove the battery and board the aircraft with it. The coordinator also advises the loading supervisor ("*ramp*" service) of the presence of and type of mobility aid.

The procedure put in place by Alysia allows for the wheelchair to be taken charge of at check-in or, on passenger request, later on when boarding. In all cases, the procedure stipulates that the passenger must declare the battery when s/he is taken charge of by an agent and then remove, isolate and carry the battery into the cabin.

Paris Aeroport (ADP) provides assistance to passengers with reduced mobility. This assistance was subcontracted to Samsic for this flight. The Samsic personnel do not take charge of the personal effects of these passengers.

The operator's security agents are present throughout the check-in and boarding process for EL AL flights out of Paris-Charles de Gaulle. These agents are solely responsible for security aspects.

2.3 Information collected from Alysia (EL AL subcontractor)

The passenger wanted to keep his wheelchair and go from the check-in to the departure lounge unaided. During the check-in, the Alysia “check-in” agent questioned the passenger about the type of battery equipping his wheelchair and informed him that he had to remove the battery before boarding the aeroplane. In the departure lounge, the Alysia coordinator (“traffic” service) also questioned the passenger who was said to have replied, in French, “Yes, I’ll do as [when] I came by plane.”

On leaving the departure lounge, the passenger was accompanied by the Samsic agent to the boarding jetway. In the jetway and in accordance with the procedures in force, the Samsic agent installed the passenger in a transfer wheelchair and handed over the passenger’s wheelchair: no Alysia agent was present at that time.

The EL AL’s security agent took the wheelchair onto the tarmac to hand it over to the Alysia luggage handlers (“ramp” service). The supervisor saw a red pouch attached to the wheelchair which he thought seemed full and heavy. He supposed that the battery was in the pouch but was not able to check this as the procedures prohibit him from opening passengers’ personal effects. The wheelchair was then loaded and secured in the aeroplane’s aft hold.

After the incident, an Alysia manager spoke to the passenger but the latter did not seem to understand the questions being asked and gave contradictory answers.

The investigation found that the presence of the battery had indeed been recorded by Alysia but not its location or the possibility of there being several batteries.

2.4 Training of Alysia personnel

The Alysia agents responsible for tracking passengers’ personal effects follow different training courses according to their responsibilities. The program of these training courses includes the handling of dangerous goods and a chapter is specifically dedicated to lithium batteries.

The “check-in” agent responsible for the check-in had followed a four-hour training course entitled “*Recurrent training of personnel carrying out checks with respect to the transport of dangerous goods which may be present in hold luggage and/or carried into the cabin by passengers and/or crew*” on 5 February 2019 (valid for two years).

The coordinator had followed a seven-hour training course entitled “*Dangerous goods training – traffic agents*” on 8 January 2018 (valid for two years).

The “ramp” supervisor had followed a four-hour training course entitled “*Operator personnel and ground handling agencies involved in handling, storing and loading cargo, mail and luggage*” on 22 August 2018 (valid for two years).

2.5 Information collected from Samsic (ADP subcontractor)

For boarding purposes, the Samsic agent installed the passenger in a transfer wheelchair in the jetway. The Samsic agent specified that the passenger folded his wheelchair himself and handed it to the EL AL security agent. He did not specify that he saw the passenger remove the battery and did not remove it himself.

The company indicated that its agents never handle passengers' electrical wheelchairs.

2.6 Inspection of wheelchair before being loaded in hold

Before being loaded in the hold, the electrical wheelchair underwent an x-ray security inspection. It was then checked by dogs. These checks are for security purposes only, in this case to detect explosives, and are not designed to forestall the possible presence of a battery.

2.7 Passenger's statement

The passenger spoke French but did not seem to be very at ease in the language. The exchanges during the check-in and boarding were in French. He declared that during the boarding, the agents told him that they knew what to do with the wheelchair and that he did not have to do anything. He therefore handed over the wheelchair as it was, with the battery in place.

He added that on the outgoing flight from Tel-Aviv to Paris, he had been asked to remove the battery but not on the return flight.

He confirmed that he only had one battery.

3 - CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.

Scenario

After checking in for flight LY326 with Alysia (EL AL subcontractor), the passenger kept his own electrical wheelchair in order to go to the boarding zone. Shortly before boarding the aeroplane, a Samsic agent (ADP subcontractor) installed him in a transfer wheelchair. The passenger folded his wheelchair himself and handed it to an EL AL security agent.

Following a lack of understanding and despite the instructions given by the Alysia agents during the check-in and in the departure lounge, the passenger supposed that one of the agents with whom he was dealing was going to remove the battery and that he did not have to do it. The wheelchair was then subject to checks which are not designed to identify the battery. The loading supervisor then took charge of the wheelchair but did not identify that the battery was still in place: he supposed that the red canvas pouch attached to the wheelchair contained the battery without being able to confirm this. He did not identify or did not know that the passenger should have carried the battery in the cabin.

After the wheelchair had been secured in the aft hold of the aeroplane, a short circuit occurred in the wheelchair's electrical system for unknown reasons. The battery, still connected, sustained this short circuit which resulted in incipient combustion. The battery was in immediate contact with the combustion zone which could have created thermal runaway inside the battery.

Following the incipient combustion, a warning was activated in the cockpit. The crew then complied with the procedures, declared an emergency situation and constantly analysed the situation to adapt their actions until all the passengers and crew members had safely evacuated the plane.

Contributing factors

The following factors may have contributed to the incident:

- ☐ Lack of understanding between the passenger and ground personnel, the passenger spoke French but visibly did not understand it very well.
- ☐ The “*traffic*” agent not checking that the battery had been removed, either when the passenger left his wheelchair or, in any case, before the “*ramp*” loading agent took charge of it.
- ☐ Incomplete or unsuitable procedures which did not ensure the continuous tracking of the battery information.
- ☐ Insufficiently effective training of the Alysia agents and in particular the loading supervisor which meant that he did not react to the presence of a battery which he thought was in the red pouch and which should have been carried by the passenger in the cabin.
- ☐ Checks solely focused on security and looking for explosives, not designed to detect the presence of the battery on the wheelchair before it is loaded in the hold.
- ☐ An unidentified internal fault which caused a short-circuit in the wheelchair’s electrical system.

Measures taken since incident

Following this incident, Alysia identified the weaknesses in the tracking of electrical mobility aids, Alysia personnel not being present at all stages. Alysia decided to introduce a tracking sheet, filled in during the check-in and added to during the various steps of the handling process. This sheet is physically attached to wheelchairs and indicates, in particular, the type of battery and how it is to be transported, in the hold or in the cabin.

The 2020 health crisis and the consequent downturn in air traffic have not yet allowed the company to check the effectiveness of this new procedure and to validate it.