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INVESTIGATION REPORT

Accident to BOEING 777-328ER registered F-GSQL

on 16 September 2018
at Sir Seewoosagur Ramgoolam airport (Mauritius)

Time	Around 16:10[1]
Operator	Air France
Type of flight	Commercial Air Transport
Persons on board	Captain, 2 First Officers, 10 cabin crew, 279 passengers
Consequences and damage	7 passengers slightly injured, 1 passenger injured

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in May 2020. As accurate as the translation may be, the original text in French is the work of reference.

[1] Unless otherwise specified, the times shown in this report are expressed in Coordinated Universal Time (UTC). Add two hours to obtain the time in mainland France and three hours to obtain the time in Mauritius on the day of the occurrence.

In-flight retail trolley comes loose during take-off run, hitting passengers

1 - HISTORY OF THE FLIGHT

Note: The following information is mainly based on the statements of the crew and passengers.

On the day of the occurrence, flight AF463 between Sir Seewoosagur Ramgoolam airport and Paris-Charles de Gaulle airport (Val d'Oise) was operated with the Boeing 777 registered F-GSQL. Due to an operating contingency, the aircraft used was not the one initially scheduled. This had an impact on the number of cabin crew, the allocation of passenger seats and their travel class and therefore disrupted the preparation of the flight and the aircraft, as well as the boarding.

On the application of thrust, an in-flight retail trolley located at the front of the aircraft in galley G0 (point ❶ in Figure 1) came out of its stowage slot, rolled down the right-hand aisle of the cabin and came to a stop at seat 39J (point ❸). The trolley injured eight passengers along the way. The passenger sitting in seat 25K (point ❷), who was leaning over into the aisle, suffered a serious face injury.

A doctor, who responded to an appeal made by the chief purser, attended to the injured passenger. During a teleconference call from the cockpit between this doctor and an EMS dispatcher on the ground, it was decided that the passenger's condition did not require the aircraft to divert and that she would be taken care of on arrival.

During the rest of the flight, the passenger was regularly monitored by the doctor and a member of the cabin crew. The aircraft landed at Paris-Charles de Gaulle airport at 03:17, and the medical services took charge of the passenger on the apron at 03:28.

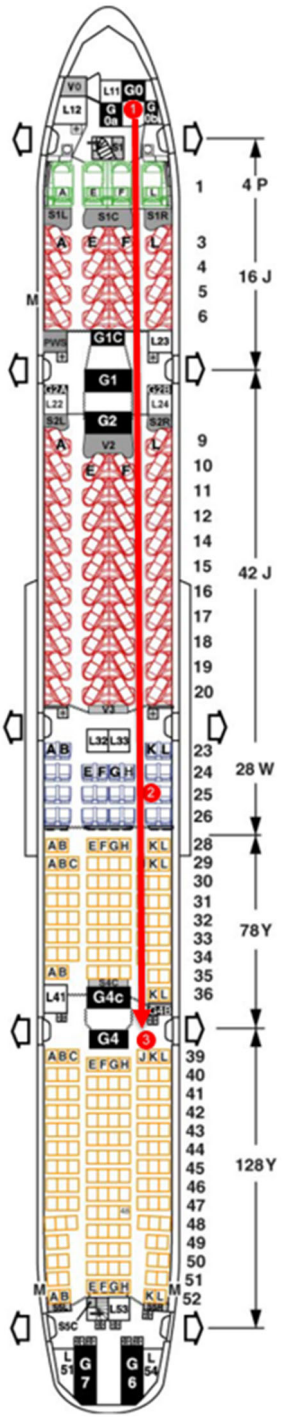

Figure 1: Cabin configuration of F-GSQL and route taken by the in-flight retail trolley

2 - ADDITIONAL INFORMATION

2.1 Cabin configurations

2.1.1 Travel classes, on-board service and cabin configurations

For long-haul flights, the operator markets seats in four travel classes. For each of these travel classes, it offers the corresponding levels of on-board service.

For each cabin, the operator makes a distinction between the so-called ''*physical*'' configuration, which equates to the seat configuration inside the cabin, and the configuration referred to as the ''*operating configuration*'', which equates to the level of service actually provided on-board. For commercial reasons, several operating configurations may be offered for any given physical configuration.

2.1.2 Number of cabin crew and assigned roles

For each operating configuration, a specific number of cabin crew is provided by the operator in order to be able to perform the safety actions required by regulations[2] and provide the on-board services corresponding to the level of service offered.

[2] A minimum number of cabin crew is required by regulations to be able to operate a commercial flight.

The positions and roles of each cabin crew member are described in a Flight Summary Sheet (FSS) specific to each operating configuration.

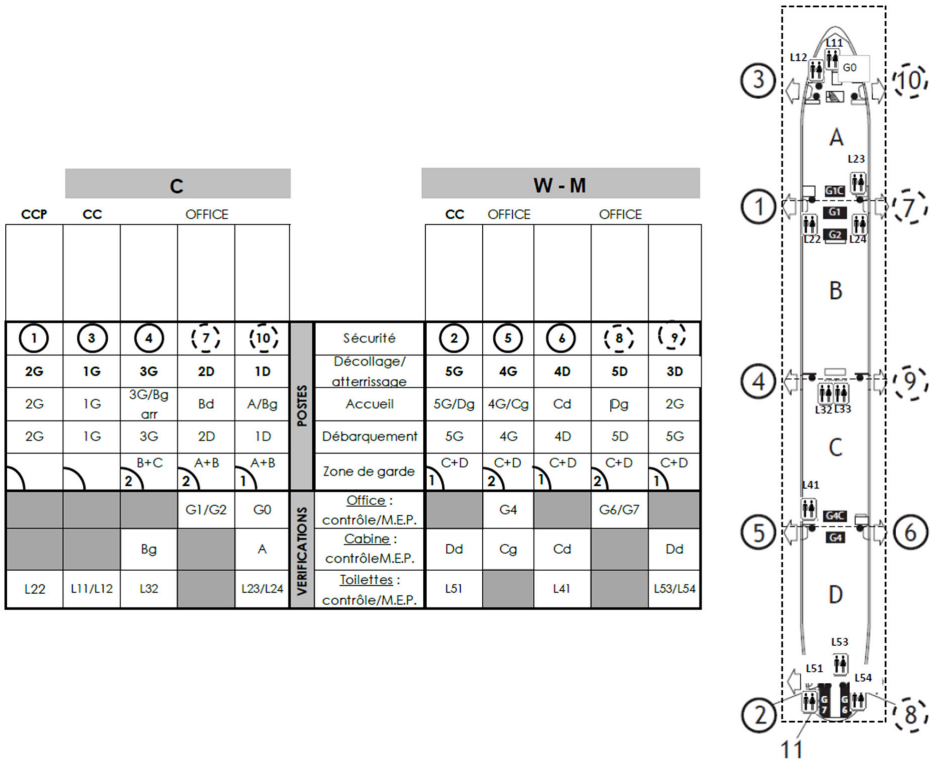

Figure 2: Example of an FSS for the Boeing 777 with the operating configuration used on the accident fligh

This document assigns a station number (see Figure 2 above) to each of the members of the cabin crew. For each of the on-board service phases of the flight, a cabin crew member is assigned either to a door (1 to 5 for the Boeing 777[3]) or to a zone[4] inside the cabin. This sheet also reminds each cabin crew member of the zones in which they must perform some of the safety actions for which they are responsible.

[3] Door 1 is the door at the front of the aircraft; ''*D*'' and ''*G*'' indicate whether it is a door on the right or left side of the aircraft.

[4] The aircraft is divided into four zones denoted by the letters A to D; the right side and left side sections of these zones are indicated by the letters ''*d*'' and ''*g*''.

2.2 Aircraft replacement and adaptation procedures

When an incident occurs with respect to an aircraft and it has to be grounded temporarily, another of the operator's aircraft may be used as a replacement. In which case, an aircraft replacement procedure is initiated.

As the physical configuration of the replacement aircraft may differ from that of the aircraft being replaced, the OCC[5] uses a document called a ''*configuration catalogue*'' to adapt the operating configuration. This document lists, for a given physical configuration (that of the replacement aircraft), all the possible adapted operating configurations. The OCC is in charge of notifying the crews and the various service providers of the configuration adopted.

[5] Operations Control Centre.

2.3 Operating environment on day of occurrence

2.3.1 Aircraft replacement and action by OCC

Due to an incident with another aircraft in the fleet, the originally scheduled aircraft was replaced by F-GSQL. F-GSQL has a different physical configuration to those of the Boeing 777-300s that are usually used for the flights between Paris-Charles de Gaulle and Sir Seewoosagur Ramgoolam airports, which are operated with 11 cabin crew (including 1 chief purser and 1 purser).

The OCC controller misread the catalogue, which led to an incorrect configuration being communicated. The differences between the intended configuration and the incorrect configuration are specified in the following table:

	Maximum number of passengers in business class	Maximum number of passengers in premium economy class	Maximum number of passengers in economy class	Number of cabin crew	*Including purser*	*Including chief purser*
Configuration usually used between France and Mauritius (except in the event of an aircraft replacement)	**14**	**32**	**422**	**11**	***1***	***1***
Adapted configuration listed in the catalogue	**16**	**42**	**234**	**10**	***1***	***1***
Incorrect adapted configuration communicated by the OCC	**58**	**28**	**206**	**10**	***2***	***1***

2.3.2 Operational consequences

The crew had one too many cabin crew members for the occurrence flight, but were missing one purser. The OCC therefore indicated to the chief purser the name of the cabin crew member who would not be working on the flight and notified him of the need to designate a crew member from among the other crew members to fulfil the role of "*acting purser*".

The catering service provider[6] was also informed about this new configuration and the required change in meal service.

[6] Meals served to passengers during the flight.

The change of aircraft also gave rise to flight cancellations for some passengers and upgrades for others.

2.4 In-flight retail trolley information

The in-flight retail trolley is located at the front of the cabin, opposite the right-hand aisle. It is locked into its stowage slot using red latches that are located at the top of the slot.

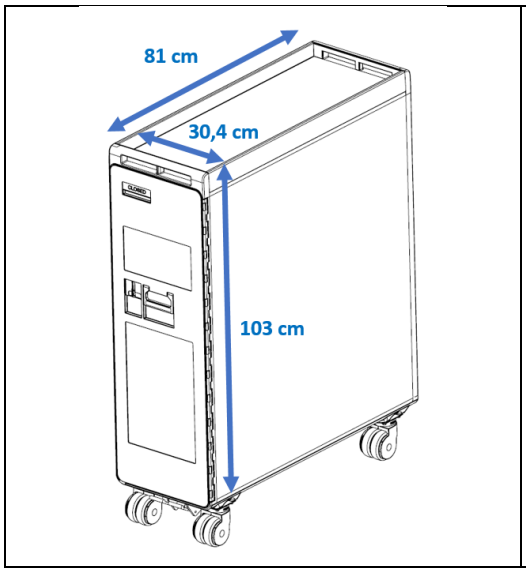

Figure 4: diagram of an in-flight retail trolley

Figure 5: slot in galley G0 where the in-flight retail trolley is stowed (shown in red)

This trolley contained goods that could be purchased during the flight. On the day of the occurrence, its weight (including its contents) was approximately 80 kg.

2.5 Standard procedures

2.5.1 Checking in-flight retail trolley

Lead seals are fitted at the front and rear of the in-flight retail trolleys to ensure that their contents have not been tampered with between flights. The integrity of the seals must be checked by the chief purser or by another member of the cabin crew delegated for that purpose as part of the initial checks of the aircraft. This operation requires the trolley to be removed from and then put back in its stowage slot.

2.5.2 Checking and securing the cabin before take-off

In preparation for take-off, the cabin crew must check that the aircraft cabin is secure and then inform the flight crew.

To do this, each member of the cabin crew must check the zone under their charge. Upon completion of the check, each cabin crew member returns to their position and reports to the nearest purser via the intercom system. Each purser will then report to the chief purser via the intercom system. As soon as the chief purser receives confirmation from the pursers that the cabin has been secured, he sends the ''*cabin ready*'' message to the flight crew. Thus, when this message is sent, it is considered that each cabin crew member is seated and strapped in for the potentially impending take-off.

2.6 Statements

2.6.1 Chief purser

He indicated that he and the purser had been notified the day before departure by the OCC that the return flight would be modified because the aircraft was to be replaced.

In order to prepare for the flight, the chief purser has several reference documents specific to each aircraft configuration that are available in an electronic flight file and accessible on a tablet[7]. Neither the chief purser nor any of the cabin crew were able to find the documents for the new cabin configuration on their tablets. The chief purser finally found these documents in the on-board documentation cabinet when the crew entered the aircraft and began the checks.

[7] On the day of the occurrence, the FSS were not available on the cabin crew's tablets.

The chief purser indicated that the catering services had not completed loading when he arrived at the aircraft. At the request of a station agent, the chief purser postponed the boarding time by a few minutes so that the checks could be performed properly.

The cabin crew then held its pre-flight briefings. The purser conducted the passenger briefing, during which he pointed out that the passengers might not be in a relaxed mood since several passengers had had their flights postponed, some had been placed on a waiting list at the airport and boarding had been delayed. The acting purser conducted the safety briefing.

At the end of the briefings, catering staff were still on board and it was therefore not possible to start boarding. The chief purser indicated that a significant amount of loading was required and that it was done in a disorganised manner. The cabin crew therefore assisted with loading the aircraft, which is not standard practice.

The chief purser delegated the lead seal check of the in-flight retail trolleys to the acting purser. As the aircraft loading plan was not available, it was agreed that this check would be done in-flight so as not to further delay boarding.

Once the plane was loaded, boarding was able to begin. Passengers discovering the services offered in business class regularly called the crew, whose availability was limited.

When boarding had been completed, the cabin crew performed the safety demonstrations and checked the cabin. The chief purser received the reports from the two pursers and notified the flight crew that the cabin was ready. He then sent a message to the cabin indicating to the cabin crew that the ''*cabin ready*'' message had been sent. At the beginning of take-off, the chief purser heard a loud noise and thought he saw an in-flight retail trolley go by. As the take-off run had already begun, he could not move or make a phone call. Shortly after take-off, the cabin crew member at door 4 notified him that an in-flight retail trolley had arrived in his zone. The chief purser then notified the flight crew of the situation. A call for any doctors on-board to assist was made and the passenger was attended to and monitored.

2.6.2 Cabin crew member on duty at station 10

The cabin crew member indicated that, prior to boarding, she had checked galley G0, which contained only trolleys for in-flight sales and crew services. In particular, she checked that the in-flight retail trolley was present, but did not check the integrity of the lead seals, which was a task to be performed by the acting purser.

She then went to door 2 to check loading of the catering trolleys. The trolleys loaded did not correspond to the cabin plan. The cabin crew therefore started to re-arrange the trolleys before passenger boarding, considering that it was easier to do so on the ground than in-flight. They had not finished re-arranging them by the time boarding commenced and had to stow the trolleys away to allow for boarding.

During boarding, the cabin crew member attended to the business class passengers alone[8], welcoming the passengers, providing the cloakroom service, serving the welcome drink, distributing the amenity kits and assisting passengers (in particular on how to use their seats). Due to the large number of upgraded passengers, there were more passenger requests than usual. The cabin crew member indicated that she felt "*overwhelmed*".

[8] The cabin crew member at station 7, who should have welcomed passengers in part of the business class cabin, was mainly stationed at galley G2 where she was preparing the pre-take off services for the business class passengers.

Once the doors had been closed, the safety demonstrations were performed. The cabin crew member then checked the cabin before directly reporting to the chief purser at door 2, where the acting purser was also stationed. The cabin crew member then returned to her station at door 1R for take-off. When she arrived in the galley, she noticed that a lot of newspapers and magazines had not been stowed away. She gathered them together and put them away in a cupboard, and then heard the message that the cabin crew should be seated and strapped in. She did not have time to check galley G0 again.

On the application of thrust, she saw the in-flight retail trolley come out of its stowage area, but could not catch it.

She felt that it was becoming difficult for cabin crew to perform both on-board passenger services and safety-related services. Certain passenger services requested by the operator are therefore, in her view, not feasible with the number of cabin crew provided for in certain cabin configurations.

3 - CONCLUSIONS

***The conclusions are established solely on the basis of the information that came to the knowledge of the BEA during the investigation. They are in no way intended to apportion blame or liability*.**

Scenario

The flight was operated using an aircraft with a cabin configuration that was different from that of the aircraft normally used for this destination.

As a result of the configuration catalogue being misread, the OCC sent an incorrect adapted operating configuration to the crew and catering services. The incorrect configuration entailed a significant number of upgrades to business class compared to the configuration that should have been used, as well as an unconventional meal preparation for the in-flight service.

In addition, the crew was unable to access the documents required to prepare the flight with the adapted configuration because these flight documents were not accessible from their tablets. The crew did not read the documentation until they arrived on the aircraft shortly before the passengers boarded. It was therefore not possible for the chief purser and the purser to make advance preparations for the flight during the stopover and the cabin crew discovered their stations and roles just prior to boarding. In particular, the workload for the cabin crew during the ground phase was not identified as a threat during the safety briefing, which meant that no adjustment to, or postponement of, the planned passenger services was made.

When the cabin crew member at station 10 took up her position, she checked galley G0, for which she was responsible. The investigation was unable to determine whether the position of the locking tabs for the in-flight retail trolley had been properly checked or whether the trolley had been handled after the check.

As the catering service providers were unaware that the incorrect configuration of the aircraft had been communicated by the OCC, loading errors were made, there by necessitating postponement of the start of boarding. In order to limit the impact on the in-flight service, the cabin crew made numerous readjustments in the cabin. These additional tasks caused the cabin crew to deviate from the passenger service roles normally assigned to them in the FSS. The cabin crew member at station 10 was thus required to greet all the passengers in business class during boarding, taking over some of the duties normally assigned to the cabin crew member at station 7, who was otherwise occupied. These passengers, most of whom had been upgraded, requested assistance on numerous occasions, thereby generating a heavy workload.

Following the safety demonstrations, the cabin crew member at station 10 reported the securing of the front section of the cabin directly to the chief purser at door 2L, which was contrary to standard procedures. The chief purser subsequently made the ''*cabin ready message sent*'' announcement, which is not part of standard procedures, even though some cabin crew had not yet arrived at their stations. The cabin crew member at station 10 had to quickly return to her station at door 1R and was therefore unable to perform a final check of galley G0 prior to take-off.

On the application of thrust, the in-flight retail trolley, which was not held in place by the locking labs, came out of its stowage slot, without it being possible for the cabin crew member at station 10 to prevent it from rolling away. The trolley hurtled down the right-hand aisle of the cabin, hitting several passengers and seriously injuring one passenger in the face.

Contributing factors

The use by the OCC of a non-automated tool in all probability contributed to the selection and subsequent communication of an incorrect operating configuration within the framework of the aircraft replacement procedure.

The following factors contributed to an unusually high workload for the crew during the pre-take off ground phase:

- communication by the OCC of the incorrect configuration, which led to a large number of passengers not accustomed to the services provided in business class being upgraded to business class, and to the incorrect loading of on-board services by the catering services;
- the fact that the crew were only acquainted with the flight preparation documentation at a late hour because these documents were not available on the cabin crew's tablets meant that the crew had to adapt quickly to an unexpected situation and did not re-evaluate the advisability of postponing certain passenger services;
- the focus of the cabin crew on passenger services to the detriment of certain safety actions, due in particular to their desire:
  - to re-arrange the loading of trolleys intended for passenger services in order to limit the impact for passengers during the flight,
  - to provide those passengers services and to respond to a higher than usual number of passenger requests on a plane where business class was full.

The following factors contributed to the failure by the cabin crew member at

station 10 to detect that the in-flight retail trolley was not locked in place:

- the unusually high workload for the cabin crew before and during boarding, which led to galley G0 being partially secured;
- the failure to follow standard reporting procedures, which did not allow for a final check of galley G0 before take-off.

Safety lessons and measures taken

This occurrence enabled the operator's flight safety department to determine that cabin crew culture remains very much focused on the provision of passenger services and the desire to satisfy passengers to the detriment of certain safety actions. In the context of the accident flight, it is specified in particular, that the priority given to passenger services was especially difficult to rectify because the information that could have called into question this prioritisation was not available to the crew sufficiently in advance.

Following this occurrence, the operator's flight safety department issued an internal ''*Safety First*" memo to all cabin crew reminding them of the general principles of cabin checks and cabin-ready confirmations. In particular, it states that securing the galleys is a priority and must be done before the aircraft pushback. In addition, it is specified that passenger services shall be provided after take-off when necessary, in order to give priority to preparing the aircraft and completing safety procedures. It is also recalled that the ''*cabin ready message sent*'' type announcement is not a standard procedure and is to be avoided, as it encourages violations (cabin crew not strapping in immediately after reporting to the purser) and leads to a normalization of non-standard practices and the corresponding risks (cabin crew expecting an announcement at each flight and exposing themselves to injuries).

In addition, the operator raised awareness about the use of the configuration catalogue among newly arrived OCC controllers and cabin crew managers. According to the operator, it is no longer possible to make the same error, as a cross-check is performed by the controller and the cabin crew manager. In addition, measures have been taken to automate the aircraft configuration management system.

Finally, all documentation relating to aircraft configurations has been made available to cabin crew on their tablets since the summer of 2019. Cabin crew have been taught how to use this documentation in training information sessions.