

Technical report

IN-057/2022

Incident on 6 October 2022 involving an AIRBUS A-320-214 aircraft, registration EC-MAO, operated by Vueling Airlines S.A., and a PIPER PA-28-161 aircraft, registration EC-MBV, operated by Flight Training Europe S.L, at Seville Airport (Spain)

Please note that this report is not presented in its final layout and therefore it could include minor errors or need type corrections, but not related to its content. The final layout with its NIPO included (Identification Number for Official Publications) will substitute the present report when available.



FOREWORD

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission regarding the circumstances of the accident that is the object of the investigation, its probable causes, and its consequences.

In accordance with the provisions of Article 5.4.1 of Annex 13 of the International Civil Aviation Convention, Article 5.6 of Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010; Article 15 of Law 21/2003 on Air Safety; and Articles 1 and 21.2 of RD 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent their recurrence. The investigation is not intended to attribute any blame or liability, nor to prejudge any decisions that may be taken by the judicial authorities.

Therefore, and according to the laws specified above, the investigation was carried out using procedures not necessarily subject to the guarantees and rights by which evidence should be governed in a judicial process.

As a result, the use of this report for any purpose other than the prevention of future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.



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ABBREVIATIONS

°	Degrees
A/C	Aircraft
AESA	Spanish Aviation Safety Agency
AGL	Above ground level
APP	Approach control office
ATC	Air traffic control
ATPL(A)	Airline transport pilot license
ATS	Air traffic service
DME	Distance measuring equipment
DVOR	VOR Doppler
FDR	Flight data recorder
ft	Feet
h	Hours
IAF	Initial approach fix
ICAO	International Civil Aviation Organisation.
IFR	Instrument flight rules
IR(A)	Instrument rating
kg	Kilos
km	Kilometres
kt	Knots
LEZL	ICAO airport code for Seville Airport
METAR	Aviation routine weather report (in aeronautical meteorological code)
NM	Nautical miles
PF	Pilot flying.

PM	Pilot monitoring.
SERA	Standardised European Rules of the Air
TMA	Terminal control area
TWR	Control tower
UTC	Coordinated universal time
VFR	Visual flight rules
VMC	Visual meteorological conditions

Technical report

IN-057/2022

Owner and Operator:	A/C 1: Vueling Airlines S.A. A/C 2: Flight Training Europe S.L.
Aircraft:	A/C 1: AIRBUS A320-214, EC-MAO (Spain). A/C 2: PIPER PA-28-161, EC-MBV (Spain).
Date and time of incident:	6 October 2022 at 18:14 h local time ¹ .
Site of accident:	Seville Airport.
Persons on board:	A/C 1: 6 (crew members), 166 (passengers). A/C 2: 1 (crew).
Type of operation:	A/C 1: Commercial air transport – Scheduled – Domestic – Passengers. A/C 2: General Aviation – Instruction.
Phase of flight:	A/C 1: Approach – Final approach. A/C 2: Taxi – Taxi to runway.
Flight rules	A/C 1: IFR. A/C 2: VFR.
Date of approval:	27 September 2023.

¹ Unless otherwise indicated, all times referenced are UTC. The equivalent local time can be calculated by adding 2 hours to the UTC.

Synopsis

Summary:

On 6 October 2022, at around 18:09 h local time, the PIPER PA-28-161 aircraft with registration EC-MBV, operated by a solo student pilot, was preparing to fly back to Jerez Airport and began taxiing through the movement area of Seville Airport after being cleared to do so by the only controller on duty in the TWR at that time. The instruction given by the controller was to taxi to the holding point on taxiway HP2 (runway 09 was in service) and call him when he was ready to take off.

Approximately half a minute after this communication, the controller cleared the AIRBUS A320-214 aircraft with registration EC-MAO, which was approaching Seville Airport from Tenerife North Airport, to land on runway 09 at Seville Airport.

Approximately two minutes after that communication, the student pilot at the controls of the EC-MBV aircraft contacted the controller from the HP2 taxiway holding position to inform him that he was ready to take off. The controller immediately instructed him to hold short². However, the student pilot entered the runway without the controller realising, which resulted in a runway incursion.

A little over a minute later, the crew of the EC-MAO aircraft informed the controller that there was something on the runway. Consequently, they proceeded to initiate a missed approach on their own initiative.

Once the EC-MBV aircraft had left the runway at the controller's request, the EC-MAO aircraft landed on runway 09 at Seville Airport without further incident.

No personal injuries or material damage were caused.

The investigation has determined that the cause of the incident was a runway incursion by the EC-MBV aircraft due to the student pilot's failure to comply with the procedures prescribed in the SERA.

The following factors are thought to have contributed to the incident:

- The fact that the controller did not change his communications to English.
- That fact that the airport stop bars were not used, as the Seville control tower Operating Manual does not stipulate their use during daylight hours in visual meteorological conditions.

As a result of the investigation, a safety recommendation has been issued to SAERCO, the provider of air traffic control services at Seville Airport.

² The instruction "*hold short (of the runway)*" means that the aircraft must remain at the holding position and not proceed onto the runway.

1. FACTUAL INFORMATION

1.1. History of the flight

On 6 October 2022, the student pilot of the PIPER PA-28-161 aircraft with registration EC-MBV and callsign AYR164A took off from Jerez Airport to conduct a solo training flight, under visual flight rules, from Jerez Airport to Seville Airport and back.

At around 18:09 local time, while parked on the general aviation apron at Seville Airport, the student pilot contacted the control tower to request permission to begin taxiing. At that moment, the control tower was staffed by a single controller for both aerodrome control and ground movement control (known as the "single-position configuration"). The runway in use at the time was 09.

The controller cleared the student pilot to taxi to the HP2 taxiway holding point and instructed him to contact him when he was ready for take-off.

Approximately half a minute later, the controller received a call from the crew of the A320-214 aircraft, registration EC-MAO and callsign VLG4SK, operated by Vueling Airlines S.A., with 166 passengers and 6 crew on board, reporting that they were at 9 miles on final. The controller responded immediately and, as there wasn't much traffic, cleared them to land on runway 09.

Approximately two minutes after this communication, the controller received a call from the student pilot, indicating that he was ready to take off. Prior to this call, the controller had noted the student pilot's aircraft stopped at the HP2 taxiway holding position.

In response to the student pilot's communication, the controller instructed him to hold short of the runway (literally, the instruction was "*hold short runway*"). The reason he instructed him to hold at the HP2 taxiway holding position was the impending landing of the EC-MAO aircraft, which was on final approach, although he didn't specify this to the student pilot. In response to the above instruction, the student pilot gave an unintelligible read-back.

Approximately one minute after the previous communication, there was a communication from the student pilot, and a few seconds later, the controller received a call from the crew of the EC-MAO aircraft reporting that they had observed the presence of a light aircraft at the head of runway 09. In the interview with the captain of the EC-MAO aircraft, he stated that when they saw the EC-MBV aircraft, it was stopped at the runway 09 threshold sign, so they didn't see it moving. He also said that it was difficult for him to see the student pilot's aircraft despite the good weather and that the orange tones on the wings and tail had been fundamental.

In response to the preceding communication, the controller advised the EC-MAO aircraft that they were cleared to land. The crew of the EC-MAO aircraft again reported the presence of a light aircraft on the runway, and after stating that it was a runway incursion, the controller immediately transferred the aircraft to Seville APP without prior coordination.

After a series of communications with the student pilot of the EC-MBV aircraft and with Seville APP, the controller contacted a second aircraft on approach to Seville Airport, also operated by Vueling Airlines S.A. (an Airbus A321-231, registration EC-MOO and callsign VLG9PV) to instruct the crew to continue the approach but to expect a missed approach, because he was removing the student pilot's aircraft from the runway and he didn't know if it was going to leave enough time. Given the above circumstances, the crew of this second

Vueling Airlines aircraft decided to initiate a missed approach on their own initiative when they were about 3 miles from runway 09.

Following the preceding communication, the controller instructed the student pilot to leave the runway via taxiway HP2 but had to repeat the instruction as the student pilot didn't understand it at first.

Approximately one minute later, the student pilot called the controller to advise him that he had cleared the runway via taxiway E1.

Eventually, after the landing of the two Vueling Airlines aircraft that had missed their approaches and the take-off of a third, the student pilot took off from Seville Airport without further incident.

No personal injuries or material damage were caused.

1.2. Injuries to persons

1.2.1. Aircraft AIRBUS A320-214 EC-MAO

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Total in the aircraft</i>	<i>Others</i>
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
Unharmmed	6 ³	166	172	-
TOTAL	6	166	172	-

1.2.2. Aircraft PIPER PA-28-161 EC-MBV

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Total in the aircraft</i>	<i>Others</i>
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
Unharmmed	1	-	1	-
TOTAL	1	-	1	-

1.3. Damage to aircraft

Neither aircraft sustained damage.

1.4. Other damages

There was no other damage.

³ 2 flight crew and 4 cabin crew.

1.5. Personnel information

1.5.1. Information about the crew of the AIRBUS A320-214 EC-MAO aircraft, operated by Vueling Airlines

- Captain:

On the day of the incident, the captain was 41 years old.

He had an ATPL licence with the following ratings:

- A320 (Valid until 31-12-2022).
- IR (A) (Valid until 31-12-2022).

He also had a Class 1 medical certificate, valid until 18-03-2023.

In terms of flight experience, on the day of the incident, he had accumulated 7,801 flight hours as a captain with Vueling (working in that capacity since 2015) and 825 flight hours as a co-pilot with Vueling. Before joining Vueling, he had accumulated 2,915 flight hours and had been a captain for 5 years.

At the time of the incident, he was acting as PF.

- Co-pilot:

On the day of the incident, the co-pilot was 63 years old.

He had an ATPL licence with the following ratings:

- A320 (Valid until 30-06-2023).
- IR (A) (Valid until 30-06-2023).

He also had a Class 1 medical certificate, valid until 06-03-2023.

In terms of flight experience, on the day of the incident, he had accumulated 11,064 flight hours as a co-pilot for Vueling.

1.5.2. Information about the crew of the PIPER PA-28-161, EC-MBV aircraft, operated by a student pilot from Flight Training Europe

On the day of the incident, the student pilot was 22 years old and enrolled on the integrated airline transport pilot programme (ATPL).

He also had a Class 1 medical certificate, valid until 13-07-2023.

Prior to the event, the student pilot had accumulated a total flight experience of 91 hours, all in the PIPER PA-28-161 aircraft, with 50:30 of those hours being in solo flight.

According to the student pilot's logbook, it was the first time he had flown to Seville alone, having previously flown there once before with an instructor (the day before).

On 25 November 2022, Flight Training Europe conducted an internal English language proficiency test for the student pilot involved in the incident. In this test, the student obtained the minimum required level (called operational level,

corresponding to a level 4) in all the sections assessed⁴ for the use of communications except for the section on comprehension, in which he was graded as level 3, showing, among other shortcomings, a degree of linguistic difficulty in understanding in unexpected situations⁵.

The student pilot's first language was Arabic.

1.5.3. Information about the controller.

The air traffic controller was 38 years old on the day of the incident.

He held an air traffic controller licence and the following ratings, rating endorsements and unit endorsements:

Ratings (since 2014):

- ADV (aerodrome control visual).
- ADI (aerodrome control instruments).

Rating endorsements (since 2014):

- AIR (air control).
- GMC (ground movement control).
- TWR (tower control).
- RAD (aerodrome radar control).

Unit endorsements (valid until 20-05-2023):

- ADI for Seville Airport.
- TWR for Seville Airport.
- RAD for Seville Airport.

He also had a Class 3 medical certificate, valid until 20-09-2023.

Lastly, he was in possession of the following additional endorsements:

- OJTI (On-the-Job-Training Instructor, valid until 08-10-2023).
- Assessor (valid until 21-09-2023).

Regarding his experience, he had been a controller since 2015, working at Seville Airport since 2016.

On the day of the incident, he had been on duty for 15 minutes when the event occurred (he came on duty at 18:00 local time).

The day before, he worked 7 hours (from 06:00 local time to 13:00 local time).

During the three days before that (from 02-10-2022 to 04-10-2022), he was off-duty.

⁴ The ICAO Document 9835 and the European Standard Part FCL, Subpart A, FCL.055 contain the general requirements for the assessment, endorsement and validity of English language proficiency for aircrew required to use radiotelephony communications.

⁵ Current legislation does not require trainee pilots to have the operational language proficiency level (level 4) during their training process.

1.6. Aircraft information

1.6.1. Information about the AIRBUS A320-214 EC-MAO aircraft, operated by Vueling Airlines.

- Make: AIRBUS
- Model: A320-214
- Year of manufacture: 2014
- Serial number: 6081
- Maximum take-off weight: 77000 kg
- Type of engine: CFM56-5B4/3
- Information about the operator: Vueling Airlines S.A.

The AIRBUS A320-214 aircraft, with registration number EC-MAO and serial number 6081, is a short to medium-range passenger transport aircraft powered by two turbofans.

The aircraft's registration certificate was valid until 24-04-2024.

It had an airworthiness certificate issued in April 2014 and an airworthiness review certificate (second extension) valid until 29-04-2023.

1.6.2. Information about the PIPER PA-28-161, EC-MBV aircraft, operated by a student pilot from Flight Training Europe.

- Make: PIPER
- Model: PA-28-161
- Year of manufacture: 2008
- Serial number: 28-16017
- Maximum take-off weight: 1109 kg
- Type of engine: LYCOMING O-320-D3G
- Information about the operator and the owner: Flight Training Europe

The PIPER PA-28-161 aircraft, with registration number EC-MBV and serial number 28-16017, is a single-engine low-wing aircraft with fixed tricycle-type landing gear and four seats.

The aircraft's registration certificate was issued in July 2014.

It had an airworthiness certificate issued in September 2015 and an airworthiness review certificate valid until 03-02-2023.

1.7. Meteorological information

1.7.1. Meteorological conditions

The METAR provided by the airport at the time closest to the incident was as follows:

METAR LEZL 061600Z 09010KT 040V130 CAVOK 31/12 Q1018 NOSIG=NNNN:

- Date and time: 6 October 2022, 16:00 h.
- Wind: Speed 10 knots. Angle of incidence predominantly 90°. Angle of incidence variable between 40° and 130°.
- Visibility: Visibility greater than 10 km and no clouds below the reference height. No towering cumulus or cumulonimbus. No significant weather phenomena.
- Temperature: 31 °C.
- QNH: 1018 hPA.
- No significant changes forecast for the two hours following the observation time.

Therefore, the weather conditions did not place any limitations on the operation.

1.7.2. Daylight conditions at the time of the incident

On 6 October 2022, sunset was expected at approximately 20:00 h. Therefore, the incident occurred in daylight hours. (approximately 18:15 local time).

1.8. Aids to navigation

1.8.1. Stop bars

Seville Airport has stop bars at taxiway holding positions HP1, HP2, HP3, HP4 and HP5. However, they were not being used at the time of the incident as the circumstances envisaged for their use in the unit's Operating Manual were not applicable (see point 1.17.1.1).

As far as the investigation team was able to ascertain, the stop bars are operated via a console located between the position of the aerodrome controller and the position of the ground movement controller.

1.8.2. Radar image

The radar imagery of the aircraft involved in the incident was made available to the investigation by the aerodrome control service provider at Seville Airport (SAERCO). The airport does not have a surface radar, so only aircraft above a certain altitude are tracked. As a result, it provides information on the two aircraft operated by Vueling but not on the ground movement of the student pilot's aircraft.

The following section details the radar tracking information and the communications exchanged to facilitate an understanding of the various events that took place during the incident.

1.9. Communications

The communications between the controller and the aircraft involved in the incident were obtained from SAERCO.

It should be noted that the communications between the controller and the Vueling aircraft were in Spanish, and those between the controller and the student pilot in the Flight Training Europe aircraft were in English. Based on the interview with the student pilot, this caused him a great deal of confusion because he did not understand the communications between the controller and the Vueling aircraft crews and was, therefore, unaware that the EC-MAO aircraft was approaching the airport with landing clearance.

The communications relevant to the investigation are provided below, together with the radar imagery mentioned in point 1.8.2. It should be noted that the radar imagery figures only show the aircraft operated by Vueling (as explained in point 1.8.2) identified by their callsigns:

- Vueling A320-214 aircraft with registration EC-MAO: VLG4SK.
 - Vueling A321-231 aircraft with registration EC-MOO: VLG9PV.
- 16:00:45 h: The controller involved in the incident relieved the outgoing controller, starting his shift in a single-position configuration. Up until that point, the outgoing controller had only been in contact with the student pilot of the EC-MBV aircraft to dispatch his arrival at the airport, not his departure.
- 16:09:25 h: The first communication between the controller and the student pilot of the EC-MBV aircraft took place. In the communication, the controller gave him the transponder code and the QNH.
- 16:09:36 h: The student pilot of the EC-MBV aircraft read back the transponder code but not the QNH.
- 16:10:30 h: The student pilot of the EC-MBV aircraft asked the controller for clearance to commence taxiing, correctly indicating the QNH.
- 16:10:38 h: The controller instructed the student pilot of the EC-MBV aircraft to taxi to the HP2 taxiway holding point via gate G1, and directed him to contact him again when he was ready for take-off.
- 16:10:41 h: The student pilot of the EC-MBV aircraft read back the above information except for the information relating to gate G1.
- 16:11:08 h: The crew of the EC-MAO aircraft made initial contact with the controller. In this first communication, the PM informed the controller that they were on final at 9 miles.

At this moment, the radar trace shows this aircraft over the TENDU⁶ instrument approach fix (IAF) on approach to runway 09 at 3,000 ft AGL and approximately 9 NM from the airport:

⁶ The TENDU point (IAF) is 16.99 miles from the DVOR/DME SVL.



Figure 1 – Radar image (1).

Note that, as of this moment, the controller, the student pilot of the EC-MBV aircraft and the crew of the EC-MAO aircraft were on the same radio frequency.

- 16:11:13 h: The controller cleared the crew of the EC-MAO aircraft to land on runway 09 and provided wind data and the QNH.
- 16:11:21 h: The PM on the EC-MAO aircraft acknowledged the clearance.
- 16:13:22 h: The student pilot of the EC-MBV aircraft informed the controller that he was ready to take off.
- 16:13:27 h: The controller instructed the student pilot to hold short of the runway (remain at the holding point). The literal expression used by the controller in this communication was *"Roger, hold short runway"*. There was no supplementary information to this instruction provided by the controller.
- 16:13:32 h: The student pilot of the EC-MBV aircraft read back something that, due to interference and noise in the communication, was unintelligible.

Despite this, the controller did not ask the student pilot of the EC-MBV aircraft to confirm that he had received the communication correctly, nor did the controller repeat the instruction.

At this moment, the radar trace shows the EC-MAO aircraft on final approach at 1,100 ft AGL and approximately 3 NM.

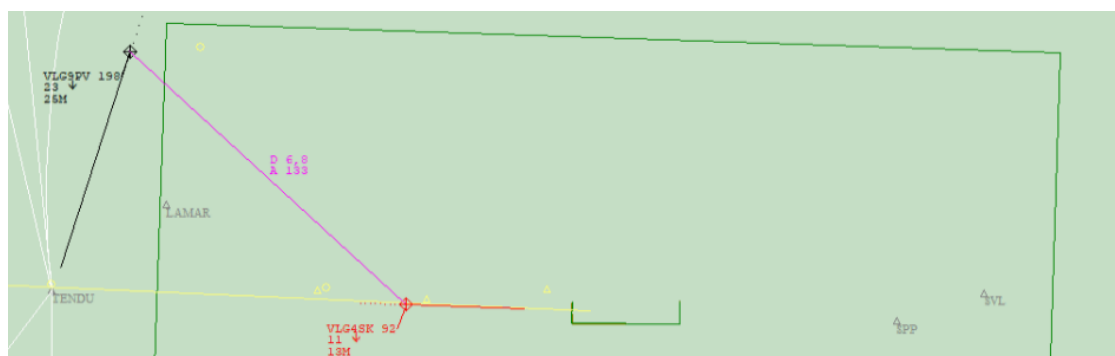


Figure 2 – Radar image (2).

- 16:14:36 h: The student pilot of the EC-MBV aircraft contacted the controller. This communication was unintelligible, except for the words *"64 runway"*.
- 16:14:39 h: The PM on board the EC-MAO aircraft contacted the controller to inform him that they could see something on the runway.

At this moment, when the crew of the EC-MAO aircraft became aware of the EC-MBV aircraft, the radar trace shows the EC-MAO aircraft on very short final at 400 ft AGL and at a distance of about 0.75 NM from the head of runway 09.

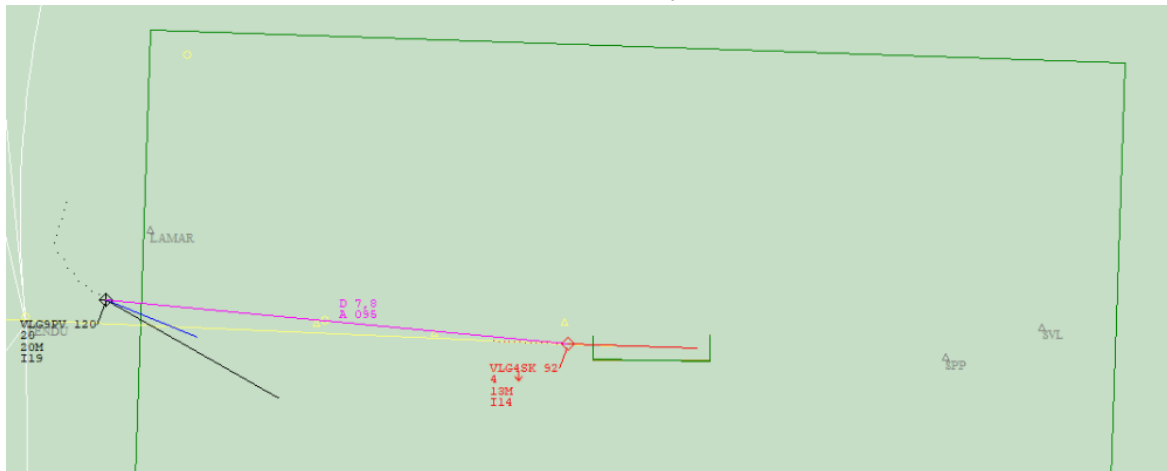


Figure 3 – Radar image (3).

- 16:14:46 h: The controller replied to the crew of the EC-MAO aircraft that they were clear to land on runway 09.

Based on the interview with the controller, when the crew of the EC-MAO aircraft called to advise him that there was an aircraft on the runway, he didn't understand them at first, so he confirmed that they were cleared to land.

- 16:14:51 h: The PM on board the EC-MAO aircraft again advised the controller that there was a light aircraft on runway 09.
- 16:14:54 h: The controller informed the crew of the EC-MAO aircraft that a runway incursion had occurred and urged them to contact Seville APP.

This transfer to Seville APP was not coordinated.

- Between 16:15:00 h and 16:15:29 h, a series of communications took place between the controller and the student pilot of the EC-MBV aircraft. In them, the controller informed him that he had instructed him to hold short of the runway, while the student pilot of the EC-MBV aircraft said that he had cleared him to enter the runway ("*I heard you line up and wait⁷*").
- Between 16:15:42 h and 16:16:05 h, a series of communications took place between the controller and an APP controller from Seville regarding the EC-MAO aircraft's missed approach. In these communications, the APP controller asked the controller if a second Vueling aircraft (EC-MOO) approaching the airport was also going to miss, to which the controller replied that it was.
- 16:16:07 h: The controller contacted the crew of the EC-MOO aircraft to tell them to continue on the approach but that they should expect to go around because there was traffic on the runway. The crew of the EC-MOO aircraft asked him to please repeat this, so the controller reiterated that they should be prepared to go around but that he was going to try to remove the aircraft (so that they could land without the need for a go-around).

⁷ The instruction to "*line up and wait*" signifies that the aircraft is clear to enter the runway and line up.

- 16:16:21 h: The crew of the EC-MOO aircraft informed the controller that, if he wished, they would proceed with the missed approach immediately. The controller received the communication and transferred the aircraft to Seville APP in a coordinated manner.

Consequently, the second Vueling aircraft performed a missed approach at a distance of approximately 3 miles from runway 09.

- 16:16:33 h: The controller instructed the student pilot of the EC-MBV to leave the runway via HP2. The student pilot of the EC-MBV aircraft asked him to please repeat, and the controller repeated the instruction.

From this moment on, a series of communications were exchanged between the controller and the student pilot of the EC-MBV aircraft, until eventually, the aircraft left the runway via E1 instead of HP2.

Subsequently, as indicated in the interview, once the EC-MBV aircraft had left the runway, the controller decided to instruct the student pilot of the EC-MBV aircraft to hold his position to prevent another possible runway incursion, and after several communications and incorrect read-backs, the EC-MBV aircraft stopped and stood by at the entrance to taxiway HP1.

Finally, before the EC-MBV aircraft took off from the airport, the two Vueling aircraft that had carried out a missed approach landed, and a third Vueling aircraft took off, for which the EC-MBV aircraft had to move a few metres further onto taxiway HP1 because it was obstructing the path of the aforementioned Vueling aircraft, which needed to access the runway via taxiway HP2 to take off. According to the interview with the controller, he decided to prioritise all pending arrivals and departures before dispatching the departure of the EC-MBV aircraft because he sensed that the student pilot was quite confused.

Note that between 16:18:10 h and 16:18:49 h, there was a series of communications between the controller and the TMA supervisor in which the controller explained what had happened. In this conversation, it's worth noting that the controller expressed that it was difficult to see the aircraft due to its small size.

1.10. Aerodrome information

1.10.1. General information about the airport.

Seville Airport is located north-east of the city of Seville, at an elevation of 111 ft above sea level. The airport is used for commercial operations, military operations and pilot school operations, among others.

1.10.2. Airport information relevant to the investigation.

The following information about the airport is considered to be relevant to the investigation:

- It has a single runway with the designation 09-27.
- The main taxiway runs parallel to the runway and is designated as A. It has five sections defined as A1, A2, A3, A4 and A5.
- Five taxiways connect taxiway A to both ends of the runway: HP1 and HP2 for runway 09 and HP3, HP4 and HP5 for runway 27.

- A further four taxiways connect taxiway A to the runway: E1, E2, E3 and E5.
- There is one apron for general aviation, one for commercial aviation and two for military aviation.
- The general aviation apron is connected to taxiway A1 through gate G1.
- The control tower is located to the south of the airport.

A map of the south-western part of the airport is shown below, as this is the area where the incident occurred:

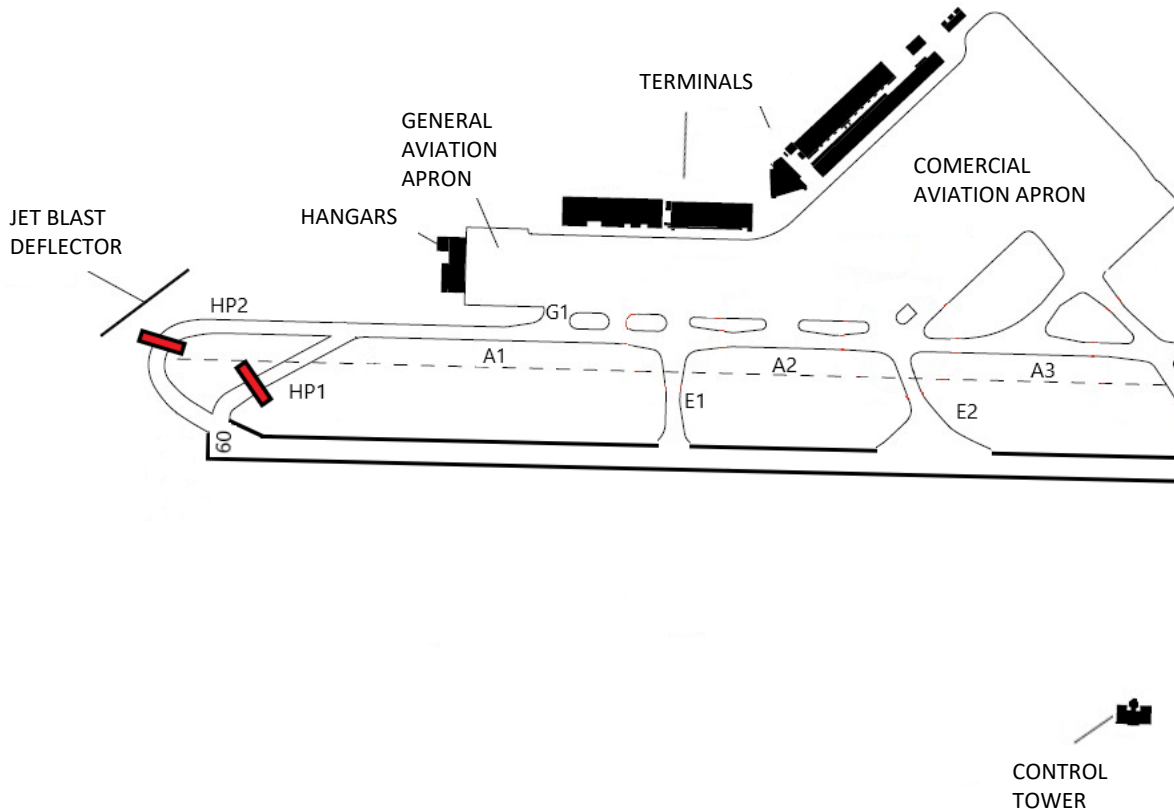


Figure 4 - Map of Seville Airport (south-west area).

Rectangles indicate the runway access holding positions on taxiways HP1 and HP2. Also shown on the map is the jet blast deflector protecting the A4 motorway from the jet blasts emitted by aircraft on HP2.

1.10.3. Information about the airport control tower.

The following information about the airport control tower is considered relevant to the investigation:

- There are two controller positions. The left-hand position is the one used in the single-position configuration. When aerodrome control and ground movement control are split (at specific times), the right-hand station is occupied by the ground movement controller. There is also a third auxiliary (standby) position located to the right of the ground movement controller.

- The stop bar actuation console is located between the aerodrome controller's position and the ground movement controller's position.

1.11. Flight recorders

The PIPER PA-28-161 aircraft, registration EC-MBV, was not equipped with a flight data or cockpit voice recorder because they are not a regulatory requirement for this type of aircraft.

With regard to the AIRBUS A320-214 aircraft with registration EC-MAO, the FDR data was obtained.

This data showed that when the EC-MAO aircraft began to execute the missed approach, it was approximately 830 metres from the runway 09 threshold and at an altitude of 196 ft above the ground.

The lowest altitude reached by the aircraft during the missed approach was 179 ft above the ground.

1.12. Aircraft wreckage and impact information

N/A.

1.13. Medical and pathological information

N/A.

1.14. Fire

N/A.

1.15. Survival aspects

N/A.

1.16. Tests and research

1.16.1. Study of the student pilot's read-back at 16:13:32 h.

The audio excerpt from 16:13:32 h, in which the student pilot read back the controller's instruction to "hold short runway", was analysed. Despite carrying out a noise clean-up process, it was not possible to reliably verify the content of this read-back.

1.16.2. Reconstruction of the runway incursion.

The following is an approximate reconstruction of the runway incursion based on data collected from:

- The FDR of the EC-MAO aircraft.
- The communications between the controller, the crew of the EC-MAO aircraft and the student pilot of the EC-MBV aircraft.
- The radar trace of the EC-MAO aircraft.

Time: 16:10:38 h.

Events: The controller instructed the student pilot of the EC-MBV aircraft on the general aviation apron to taxi to the holding point on taxiway HP2.

The EC-MAO aircraft was at an altitude of approximately 3,100 ft and around 20 km from the threshold of runway 09. It had not yet established communications with the airport control tower.

Time: 16:11:08 h.

Events: The crew of the EC-MAO aircraft made initial contact with the controller. In response to this communication, the controller cleared the crew of the EC-MAO aircraft to land on runway 09. At that moment, the aircraft was at an altitude of approximately 3,000 ft and around 17.7 km from the threshold of runway 09.

The student pilot of the EC-MBV aircraft was en route to the holding position on taxiway HP2. It is estimated that he arrived at the holding position at about 16:12:10. Once stopped at the holding position, he proceeded to perform engine tests.

Time: 16:13:27 h.

Events: In response to the student pilot's communication that he was ready to take off, the controller instructed him to hold short of the runway.

The EC-MAO aircraft was at an altitude of approximately 1,150 ft and about 6.12 km from the threshold of runway 09.



Figure 5 - Positions of the aircraft (overhead view) at 16:13:27 h (simulated figure).

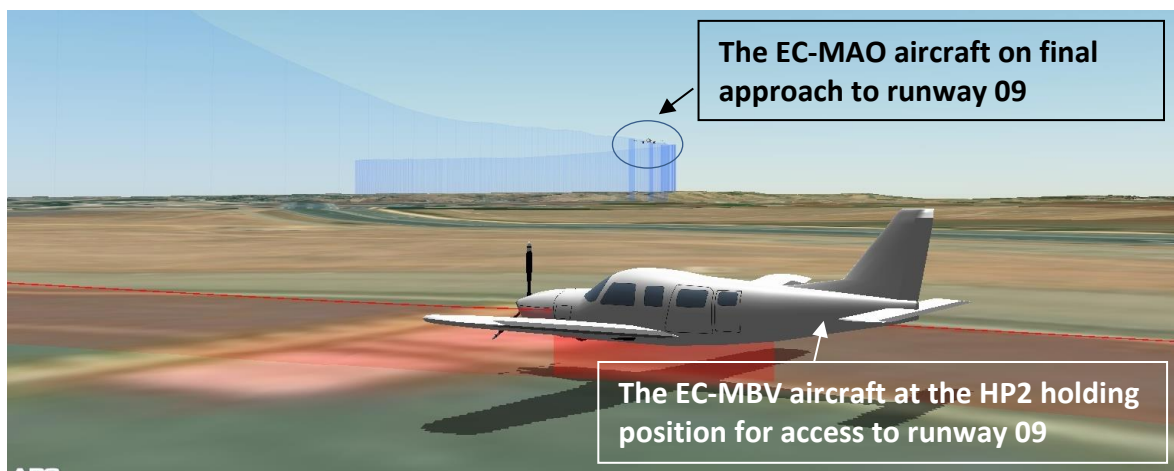


Figure 6 - Positions of the aircraft (view from HP2) at 16:13:27 h (simulated figure).

However, after this communication, the student pilot entered runway 09.

Time: 16:14:36 h.

Events: The student pilot of the EC-MBV aircraft communicated to the controller “64 runway”. There was no reply from the controller.

The EC-MAO aircraft was at an altitude of approximately 318 ft and about 1.5 km from the threshold of runway 09.

Time: 16:14:39 h.

Events: The PM on board the EC-MAO aircraft contacted the controller to inform him that there was something on the runway. The aircraft was on short final, approximately 1.3 km from the threshold of runway 09 and at an altitude of 269 ft.

The student pilot was stopped on the runway 09 threshold.

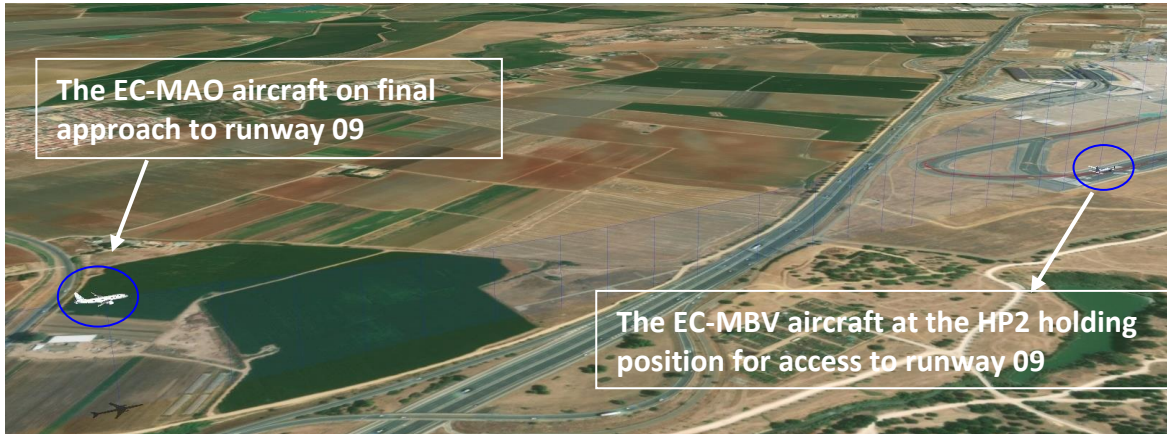


Figure 7 - Positions of the aircraft at 16:14:39 h (simulated figure).

Time: 16:14:45 h.

Events: The crew of the EC-MAO aircraft commenced the go-around. They were approximately 196 ft above the ground and around 830 m from the threshold of runway 09.

The student pilot remained on the runway 09 threshold.

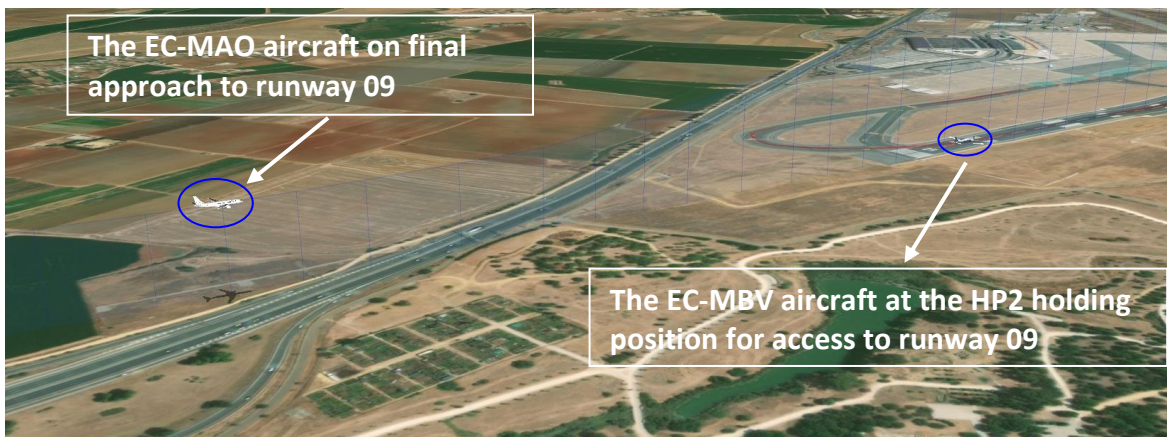


Figure 8 - Positions of the aircraft at 16:14:45 h (simulated figure).

1.17. Organisational and management information

1.17.1. SAERCO Operating Manual for the Seville Airport Control Tower.

The following information extracted from the SAERCO Operating Manual for the control tower at Seville Airport is relevant to the investigation:

1. The use of the stop bars in VMC conditions shall be as follows:
 - The stop bars must be used from sunset to sunrise (when the lack of light necessitates it).
 - Their use shall be restricted to aircraft movement and, therefore, during periods when there is no aircraft movement and/or no aircraft movement is expected, they shall remain switched off, as shall all

other lights. If only arrivals are expected, the stop bars shall remain switched off, and the runway and taxiway lights shall remain switched on.

- The use of the stop bars shall be limited to those at the holding position for the runway in use.
2. The aerodrome controllers must maintain constant visual surveillance of all operations at or near the aerodrome and have an ATS surveillance system to support such visual observation, as required by Article 4.5.1.3. of the Air Traffic Regulations.
 3. Control staff are advised, in the event of a visual traffic operation where there is reason to believe that the crew is unfamiliar with the field, to exercise caution in the flight path and monitor compliance with the ATC instructions issued.
 4. In order to prevent runway incursions, the following guidelines should be followed:
 - Special attention to read-backs.
 - Visual observation.

1.18. Additional information

1.18.1. Information provided by the controller.

- He was not aware that the "A" in the callsign AYR164A signified that it was a solo student on board.
- Since the incident, the controller has started to use the stop bars in VMC conditions when he identifies that school traffic is involved, and his workload allows him to do so, even though, in his opinion, they are not easy or convenient to use.

1.18.2. Information provided by the student pilot:

- The student pilot stated that he didn't listen carefully enough to the controller's instruction to hold short and rushed to the runway, believing he had been cleared.
- He spent approximately 1 to 2 minutes waiting at the threshold of the runway for the controller's clearance to proceed to take-off or any other communication. The situation seemed very odd to him; it was as if he'd been forgotten about.
- He crossed the holding position as soon as he heard the controller's instruction to "hold short runway", having previously made sure that the stop bar was off.
- He was unaware that traffic was approaching the airport because the communications between the controller and the crew of that traffic had been made in Spanish, a language of which the student pilot had little knowledge.

1.18.3. Flight Training Europe's Radiotelephony Guide:

The radiotelephony guide that Flight Training Europe provided includes the following advice:

- *“Although you should be listening out for the reply to your transmission, it is what you are expecting, rather than what has actually been said. Listen carefully to ensure you completely understand what has been said to you”.*

1.18.4. AESA Guide to Good Practices in Phraseology and Communications

The AESA *Guide to Good Practices in Phraseology and Communications* states that it is advisable to *“avoid the use of the local language when there is a risk of loss of situational awareness for foreign flight crews”.*

1.18.5. EAPPRI⁸ (Version 3.0)

This document advises that *“where practicable, improve situational awareness by conducting all communications associated with runway operations using aviation English”.*

1.18.6. Standardised European Rules of the Air

With regard to the read-back of clearances and safety-related information, paragraph SERA.8015 e) states:

1. The flight crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice. The following items shall always be read back:
 - i. ATC route clearances,
 - ii. clearances and instructions to enter, land on, take off from, hold short of, cross, taxi and backtrack on any runway; and
 - iii. runway-in-use, altimeter settings, SSR codes, newly assigned communication channels, level instructions, heading and speed instructions; and
 - iv. transition levels, whether issued by the controller or contained in ATIS broadcasts.
2. Other clearances or instructions, including conditional clearances and taxi instructions, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.
3. The controller shall listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back.

In relation to what is to be provided by an air traffic controller, paragraph SERA 8005, point 3, states that in order to provide the air traffic control service, an air traffic control unit shall issue clearances and information for the purpose of preventing

⁸ European Action Plan for the Prevention of Runway Incursions. Document drafted by EUROCONTROL.

collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic; an aspect also covered by the Air Traffic Regulations in point 4.5.1.1.

1.19. Special investigation techniques

N/A.

2. ANALYSIS

As set out in Section 1 (factual information), the EC-MBV aircraft produced an incursion onto runway 09 at Seville Airport when it crossed the holding position on taxiway HP2 without clearance from the controller.

The following points are analysed below:

- Aspects related to the controller's performance.
- Aspects related to the performance of the student pilot of the EC-MBV aircraft.

2.1. Aspects related to the controller's performance.

As stated in points 1.1 and 1.9, the instruction given by the controller to the student pilot to prevent the EC-MBV aircraft from accessing the runway was appropriate. Nevertheless, it was not sufficient to prevent a runway incursion from taking place.

Despite the fact that the student pilot did not comply with the instruction received, it is considered that the controller is the fundamental barrier for preventing runway incursions through the use of a series of resources which, apparently, in the case in question, were not used.

Firstly, there was no active listening on the part of the controller in the moments prior to the incident due to the fact that:

- The controller did not ask the student pilot to repeat the read-back he provided when instructing him to hold short (which, as stated, was unintelligible), the controller being the final preventative barrier for ensuring the read-back has been correctly repeated, as stated in SERA 8015 e) 3) and the tower Operating Manual.
- The controller missed the communication made by the student pilot just before he received the call from the crew of the EC-MAO aircraft alerting him to the presence of the EC-MBV aircraft on the runway.
- The controller did not react effectively to the first call from the crew of the EC-MAO aircraft to report that they could see something on the runway; instead, he simply informed them that they were cleared to land.

Secondly, the visual surveillance of aircraft receiving instructions from the control tower to check that they are being carried out correctly is considered essential, especially when handling school traffic.

It should be noted that the two resources mentioned above are included in the Seville tower Operating Manual (see point 1.17.1).

Thirdly, not using the stop bars was a pivotal factor in the runway incursion. Although their use is not mandatory according to the tower Operating Manual (see point 1.17.1), they constitute a fundamental resource that, as it was learned during the investigation, is not being used due to the poor ergonomics of the system. A safety recommendation will therefore be issued in this respect.

It is felt that the three resources outlined above were desirable and feasible given, on the one hand, that there was a reduced workload at the time (see point 1.9) and, on the other hand, the evidence that the controller had that he was dealing with a solo student

pilot (even if he was unaware that the "A" at the end of the callsign signifies a solo student pilot on board, the lack of adherence to the procedures to be applied in aeronautical communications was sufficiently manifest to suspect that the aircraft was probably being operated by a solo student pilot). Thus, the factors above should have prompted the controller to be more vigilant in his surveillance or monitoring of this flight to help the school traffic avoid making any mistakes in the different phases of the taxiing process.

Fourthly, the language barrier is also thought to have played a role in the incident, as the controller conducted all his communications with the student pilot in English while the EC-MAO aircraft crew communicated with him in Spanish. Given that the student pilot had a limited knowledge of Spanish, this contributed to him not being aware that there was an aircraft on final approach, thus undermining his situational awareness. In spite of the fact that, as stated in points 1.18.4 and 1.18.5, there are several recommendations from both national and European bodies regarding the desirability of using English in aeronautical communications when there is a foreign crew on the frequency, the reality is that at present, they are not followed at most airports in Spain.

Finally, with regard to the management of the runway incursion, as indicated in paragraph 1.9, just over one and a half minutes elapsed from the time the controller became aware of the student pilot's runway incursion until he began to instruct him to leave the runway. During this time, the controller informed the student pilot that he had committed a runway incursion and communicated with the two Vueling aircraft and APP Seville in relation to the missed approaches being flown by the two aircraft.

Therefore, although all of the above actions are considered to have been necessary, given the fact that the EC-MAO aircraft was already aware of the student pilot's aircraft on the runway and had initiated the go-around before the controller became aware of the runway incursion, the controller should have prioritised the actions necessary to, firstly, coordinate the EC-MAO aircraft's missed approach with APP Seville (which was not done), and, secondly, to instruct the student pilot to leave the runway.

2.2. Aspects related to the performance of the student pilot of the EC-MBV aircraft.

Firstly, although the student pilot's level of English was below the minimum operational level required for the licence (see paragraph 1.5. 2), it is not considered that the student pilot confused the meaning of the instruction to “*hold short runway*” with that of “*line up and wait*” taking into account the conversation held after the runway incursion with the controller, in which, after the controller said that he had instructed him to hold short, the student pilot replied “*I heard you line up and wait*”, thus justifying his reason for entering the runway. Therefore, it can be inferred from the above that the student pilot was fully aware of the meaning of both instructions.

Furthermore, the fact that the student pilot didn't realise that there was traffic on approach because the crew of the approaching aircraft and the controller were communicating in Spanish, a language the student pilot had little command of, contributed to the student pilot not listening more carefully to the controller's instruction, which it is believed he would have done had he been aware of the presence of traffic on final approach with clearance to land.

Secondly, it was noted that, in the communications between the student pilot and the Seville control tower, there was a failure to adhere correctly to the procedures to be applied in aeronautical communications, as, on occasions, he failed to follow the instructions received from ATC fully, at other times he confused his callsign and, at others, the responses and/or actions were inconsistent with the instruction received. This was even more evident in the communications exchanged after the runway incursion while the controller was instructing the student pilot to remove him from the runway, as will be discussed later in this section.

Thirdly, given that, as stated in paragraph 1.18.2 above, the student pilot entered the runway as soon as he received the instruction from the controller to hold short and taking into account the seconds it may have taken to position the aircraft on the threshold of runway 09, it is thought that less than 1 minute passed between the time he stopped on the threshold until the time he called the controller to remind him that he was on the runway, which is considered to have been appropriate on the part of the student pilot, as advised in ICAO DOC 9870⁹.

Finally, with regard to what happened after the runway incursion, as mentioned above, the communications between the controller and the student pilot further highlighted a failure to adhere correctly to the procedures to be applied in aeronautical communications and the inconsistency of the student pilot's actions with respect to the controller's instructions. In particular, the student pilot did not follow the controller's instructions to leave the runway via taxiway HP2 (from where he had entered the runway) but proceeded to leave the runway via the first taxiway he encountered (E1), increasing the runway occupancy time.

It is believed that this is related to the results obtained by the student pilot in the internal language proficiency test given by the school on 25-11-2022 (approximately one and a half months after the incident). It is considered that this fact, and the fact that the student pilot did not have a good knowledge of Spanish, left him in a potentially vulnerable

⁹ If lined up on the runway and held more than 90 seconds beyond anticipated departure time, pilots should contact ATC and advise that they are holding on the runway.

situation when operating as the only crew member on board at controlled airports and aerodromes in Spain, as far as communications with the air traffic services are concerned.

That said, it is considered probable that a student pilot with the deficiencies described above could experience complications when flying solo at a more operationally complex airport than they're used to, such as Seville Airport, and therefore, it is considered that the student pilot was not adequately prepared to carry out a solo flight of this nature.

3. CONCLUSION

3.1. Findings

- The EC-MBV aircraft produced a runway incursion when it entered the runway without the necessary clearance.
- The controller instructed the student pilot of the EC-MBV aircraft to hold short, at no time instructing him to pass the holding position and enter the runway.
- The instruction to hold short provided by the controller was in accordance with standard phraseology.
- The student pilot's read-back in response to the above instruction was unintelligible.
- The HP2 taxiway holding position stop bar was switched off because the airport stop bars were not being used at the time of the incident.
- It was the crew of the EC-MAO aircraft that noticed the EC-MBV aircraft on the threshold of runway 09, informed the controller and proceeded to go-around. At that time they were on short final, approximately 196 ft above the ground and approximately 830 m from the runway 09 threshold.
- Communications between the controller and the crew of the EC-MAO aircraft were in Spanish, while communications between the controller and the student pilot of the EC-MBV aircraft were in English.
- The student pilot was not informed of the presence of the EC-MAO aircraft, which was about to land.
- A second aircraft operated by Vueling, with registration EC-MOO, decided to go around on its own initiative given the scenario at the airport.
- The workload at the time of the incident was low.

3.2. Causes / Contributing factors

The investigation has determined that the cause of the incident was a runway incursion by the EC-MBV aircraft due to the student pilot's failure to comply with the procedures prescribed in the SERA.

The following factors are thought to have contributed to the incident:

- The fact that the controller did not change his communications to English.
- That fact that the airport stop bars were not used, as the Seville control tower Operating Manual does not stipulate their use during daylight hours in flight visual meteorological conditions.

4. SAFETY RECOMMENDATIONS

- **REC. 29/23.** It is recommended that SAERCO, as the provider of the aerodrome control service at Seville Airport, make using the stop bars mandatory, even under VMC conditions, for all operations.