

## GENERAL INFORMATION

Identification number:	2007063
Classification:	Serious incident
Date, time <sup>1</sup> of occurrence:	8 July 2007, 17.19 hours
Location of occurrence:	Amsterdam Schiphol Airport
Aircraft registration:	G-THOG
Aircraft model:	Boeing 737-31S
Type of aircraft:	Passenger aircraft
Type of flight:	Scheduled passenger service
Phase of operation:	Taxiing after landing
Damage to aircraft:	None
Number of crew:	Two
Number of passengers:	Not known
Personal injury:	None
Other damage:	None
Lighting conditions:	Daylight

## SUMMARY

The air traffic controller suggested to the crew of a Boeing 737 to leave runway 06 at the end when he gave permission to land on this runway. The crew followed this instruction literally, whereby they crossed the runway end lighting and ended up in the protection area<sup>2</sup> of the instrument landing system<sup>3</sup> for runway 36R. The air traffic controller then instructed a Boeing 737 approaching runway 36R to carry out a go-around.

This report is based on statements from the pilots concerned, conversations with the air traffic control staff on duty, the transcript of the radio traffic on the Schiphol tower frequencies, radar plots and the report from the Royal Netherlands Meteorological Institute.

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<sup>1</sup> All times in this report are local times unless indicated otherwise.

<sup>2</sup> Protection area: In order to prevent disruption of the ILS signal, a protection area has been established for each ILS which may not be used in certain circumstances.

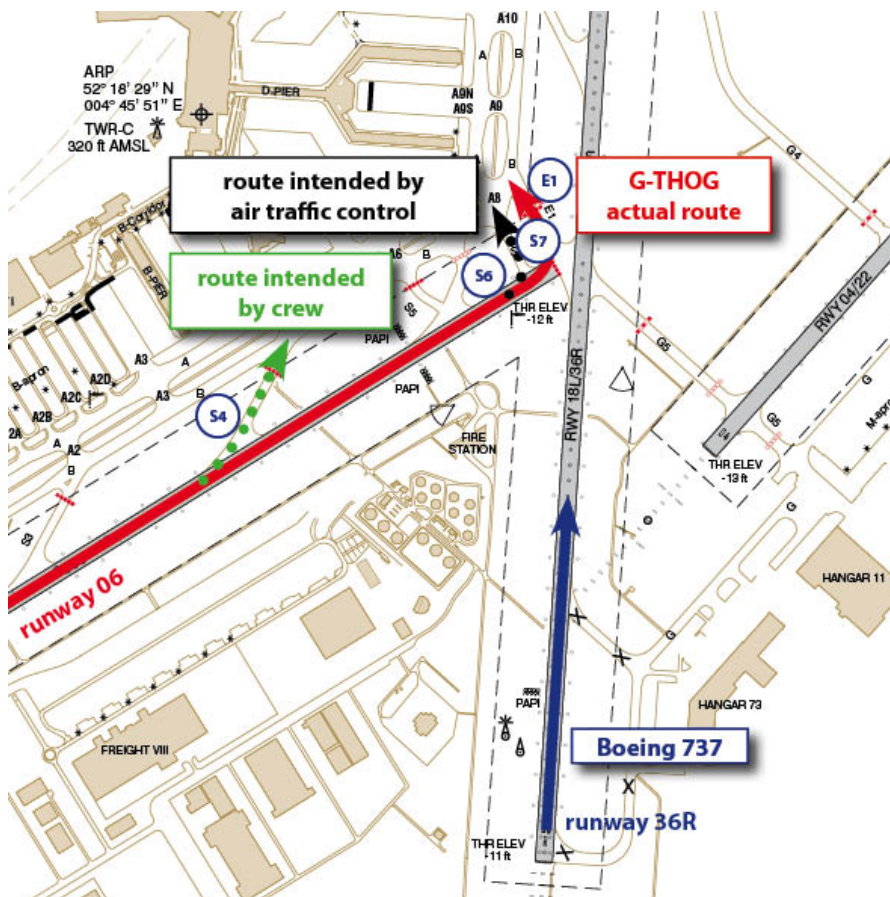
<sup>3</sup> A radio navigation system which allows a precision approach to a runway for landing.

## FACTUAL INFORMATION

### *History of the flight*

The Boeing 737 with registration G-THOG had taken off from Doncaster in the United Kingdom with destination Amsterdam Schiphol Airport. The captain was flying the aircraft and the first officer carried out the supporting activities, including operating the radio. Air traffic control had directed the aircraft to runway 06 to land.

During the approach briefing for runway 06 the crew of the Boeing 737 had planned to use exit S4 following the landing. See illustration 1. When the runway controller<sup>4</sup> gave the aircraft permission to land on runway 06, he suggested that they could roll out to the end of the runway in order to speed up their taxiing to the gate. The crew confirmed this. Seven seconds later the crew of another Boeing 737 reported on the tower frequency that they were approaching runway 36R. Thirty seconds later this flight was given permission to land on runway 36R. At that point the Boeing 737 with registration G-THOG was in the final phase of the approach to runway 06. After landing, when G-THOG was approaching the end of the runway, the first officer asked the air traffic controller for permission to turn left in order to enter intersection E1.



*Illustration 1: the route planned for and taken by G-THOG*

<sup>4</sup> The runway controller is responsible for controlling local traffic (departing and landing) with the exception of traffic under the control of the ground controller.

The runway controller saw that the nose of the aircraft had passed the threshold of runway 06 and was located in the protection area of the instrument landing system (ILS) for runway 36R. Thereupon he instructed the other Boeing 737 - which was on the final approach to runway 36R - to carry out a go-around, which was done immediately. The go-around took place from around 250 feet.

Meanwhile the crew of the Boeing 737 with registration G-THOG continued to turn to the left and entered intersection E1 away from runway 36R. The crew asked for the second time whether they could turn left in order to enter intersection E1. The runway controller explained to the crew that the end of the runway was at intersection S7 and that they had taxied onto runway 36R. The crew was given a new taxiing instruction and was transferred to ground control.<sup>5</sup> The other Boeing 737 was lined up for a new approach to runway 36R.

#### *Runways in use*

Runway 06 was the main runway and runway 36R was the secondary runway. Both runways were under the control of a runway controller.

#### *Merging runways*

The end of runway 06 merges into the intersection E1. No physical markings are in place. A row of recessed lights has been installed at the point where runway 06 ends.

#### *Personnel in the control tower*

The personnel in the control tower at Schiphol-Centrum consisted of a supervisor, a ground controller, a runway controller, an assistant 2<sup>6</sup> and a start-up<sup>7</sup> and delivery controller.<sup>8</sup>

#### *Weather conditions*

The wind was 300 degrees (north-west) with a force of 8 knots. It was cloudy with the cloud base at 4500 feet. Visibility was more than 10 kilometres. Under these conditions there were no poor visibility procedures in force.

## **INVESTIGATION AND ANALYSIS**

#### *Cockpit crew*

After the landing on runway 06 the captain saw the row of recessed red lights at the end of the runway, but did not consider them to be a stop bar to protect runway 36R. Instead he interpreted the instruction from the air traffic controller to mean that he could leave the runway via the end. The crew did not expect to enter the protection area of runway 36R by leaving the runway at the end. They were aware of the fact that runway 36R was being used as a landing runway at that time.

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<sup>5</sup> The ground controller is responsible for controlling the traffic in the maneuvering area with the exception of runways available for take-off and landing.

<sup>6</sup> The assistant 2 has a general assisting role in the tower which amongst other things includes supporting the runway controller, guiding of vehicles in the maneuvering area under responsibility of the ground controller and crossing of runways by towing traffic under responsibility of the runway controller.

<sup>7</sup> The start-up controller provides among other things start-up clearances and transfers flights to the ground controller.

<sup>8</sup> The delivery controller provides among other things en route clearances to departing flights and checks flight plan data.

Radar data shows that at the moment when the crew asked permission to turn left onto intersection E1, the aircraft was located close to or on the runway threshold and continued to taxi slowly forward.

The captain explained that it was not unusual for him to cross the runway end lights. He had visited airports on a number of occasions where landing aircraft routinely have to cross the runway end lights when leaving the runway. For this crew there was a difference in interpretation between crossing the runway end lights and crossing the stop bar lights.

#### *Boeing 737 performing the go-around*

The crew of the Boeing 737 which was due to land on runway 36R reported that when they were at 500 feet and had permission to land on runway 36R, they saw a Boeing 737 leave the end of runway 06 instead of via an exit. According to the crew the Boeing 737 stopped more or less at the threshold of runway 06 and asked for instructions, after which they were instructed by the runway controller to carry out a go-around.

Once the crew of G-THOG had asked for the second time whether they could turn left (in order to enter intersection E1), the runway controller stated that the end of the runway is at intersection S7. Because intersection S7 is at right angles to the centre line of the runway, reference is usually made to intersection S6 and this is usually used for practical reasons as a (fast) exit when the suggestion is made to leave the runway at the end. During the investigation the runway controller said that he had actually meant exit S6 and not exit S7.

#### *Air traffic control procedures*

##### *Reducing taxiing time*

It is customary for landed aircraft to leave the runway as soon as possible. However, it is not unusual for air traffic controllers to give instructions to the crew which help to reduce the taxiing time to the gate. According to the runway controller, the traffic situation on runway 06 allowed the crew to be offered the chance to extend the roll-out along the entire runway.

##### *Combined use of dependent runways*

According to the Traffic Control Service Regulations (Voorschriften Dienst Verkeersleiding) part 2 issued by Air Traffic Control the Netherlands the simultaneous use of runways 06 and 36R brings with it a dependence<sup>9</sup> of interrupted approaches to these runways. During the uniform daylight period<sup>10</sup> these regulations require a minimum visibility of 5000 metres, cloud cover at a minimum of 1000 feet and the lighting on runway 06 must be switched on.<sup>11</sup> In the event of a simultaneous go-around on runways 06 and 36R the runway controller must be able to give additional instructions to the pilots in order to limit a further conflict situation.

With the cloud base which applied at that moment and visibility of more than 10 kilometres 'dependent runways' at Schiphol are used independently. The runway controller usually resolves conflicts in the first instance on the basis of visual observations. This applies to aircraft which are still in the air.

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<sup>9</sup> Dependent runway use exists if flying operations on one runway (can) influence the flying operations on the other runway. The lay-out of the system of runways means that this is often the case at Schiphol Airport.

<sup>10</sup> This period starts 15 minutes before sunrise and ends 15 minutes after sunset.

<sup>11</sup> Additional requirements apply to flights outside the uniform daylight period.

Runway 06 and runway 36R are not viewed as dependent runways as soon as aircraft have landed. The procedures make no allowance for conflicts between traffic on runway 36R and traffic leaving runway 06 in the event of an unexpected situation when taxiing onto runway 36R.

#### *Radiotelephony*

The radio frequencies for runways 06 and 36R were linked, which meant that traffic which was tuned to one frequency could also hear the radio communication on the other frequency.

The terminology used by the runway controller following the landing on runway 06 to instruct the crew to taxi on to the end of the runway does not correspond to the standard terminology specified in ICAO document 4444.<sup>12</sup> The controller could hardly imagine that his statement would be misinterpreted by the crew, because usually no pilot passes the end of runway 06.

#### *Amsterdam Schiphol Airport*

##### *Stop bars*

The airport map of Amsterdam Schiphol Airport in the Aeronautical Information Publication (AIP) shows 'low visibility fixed stop bar' lighting at the end of runway 06. The aim of this stop bar is to prevent aircraft from leaving runway 06 and entering the protection area of runway 18L/36R. The spacing between the red stop bar lights is three metres. They are recessed in the concrete of the runway and can be physically crossed. Under the procedures in force<sup>13</sup> the stop bar was not illuminated at the time of the incident. When stop bars are illuminated they may not be crossed.

##### *Runway end lights*

There is another line of red lights at the end runway 06 as well as the stop bar lights. These are the runway end lights. The runway end lights are marked in the AIP as red lights. Alongside the threshold markings and a white line across the end of the runway, the aim of these is to provide a further indication of where the runway officially ends by creating a row of lights across the end of the runway. The spacing between these lights is 3.5 metres. If, for example, the concrete surface also physically ends, they can be installed on the runway surface. In this case these lights are recessed into the concrete and they can be physically passed.

The runway end lights were illuminated at the time of the incident as part of the runway lighting system for runway 06. Unlike stop bar lighting, there are no rules prohibiting aircraft from crossing illuminated runway end lighting. It is not unusual for traffic landing on runway 06 destined for Schiphol-Oost to be given the instruction to taxi over the runway end lights.

##### *Notices to airmen (NOTAM<sup>14</sup>)*

The published NOTAM valid on 8 July 2007 did not specify any irregularities with regard to the use of runways 06 and 36R which could be linked to the incident.

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<sup>12</sup> Doc 4444, ATM/501: Procedures for Air Navigation Services, Air Traffic Management, ICAO.

<sup>13</sup> According to Air Traffic Control the Netherlands the stop bar is illuminated if poor visibility conditions apply and runway 06 is not being used, the lighting system on runway 06 is switched off, runway 18L/36R is being used and the lighting system for that runway is switched on.

<sup>14</sup> NOTAM: Notice to airmen, a bulletin with aviation information issued by LVNL Aeronautical Information Services.

### *Exit S7*

Exit S7 is just inside the 'sensitive area'<sup>15</sup> of the ILS for runway 36R. Because no poor visibility procedures were in force, exit S7 could be used and thus the protection area for the ILS of runway 36R. Exit S7 for runway 06 is outside the 'obstacle-free zone'<sup>16</sup> of runway 36R.

## **CONCLUSION**

- The instruction to leave the runway was not unequivocal. Adverse factors were the use of (1) non-standard terminology and different interpretations of the instruction given, and (2) different experiences of the air traffic controllers and the pilots with regard to leaving the runway by passing the red lights at the end of the runway.
- There was no physical barrier such as lighting or signs which project above the runway to prevent aircraft from passing the end of the runway. This meant that there was no safety measure. Recessed lighting and runway marking can be physically passed.

Note: This report is published in English and Dutch. In the event of a difference in interpretation, the Dutch text should be deemed to be definitive.

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<sup>15</sup> The sensitive area is the area within which the presence of aircraft or vehicles can cause an unacceptable disruption of the ILS signal. This area must be kept free of vehicles and aircraft during conditions of restricted visibility; nor may work be carried out here at that time. The sensitive area is part of the protection area (see footnote 2).

<sup>16</sup> The obstacle-free zone is a three-dimensional volume of airspace which is defined in order to protect aircraft from collisions with obstacles during landing or takeoff from a runway.