SUMMARY

THE EINDHOVEN INCIDENT

On 31 May 2013, upon approaching Eindhoven Airport a Boeing 737-800 was radar vectored towards runway 21 for a landing using the instrument landing system (ILS). During the approach, clouds obstructed the view of the runway in instrument meteorological conditions. The ILS is a ground-based radio wave system used by airports providing both horizontal and vertical guidance to aircraft, under all weather conditions, guiding them to the runway along the 3 degree glide slope.

The aircraft was flying above the normal altitude that is customary for this type of approach, and the autopilot[1] and autothrottle[2] were engaged. Within two kilometres distance from the runway, at an altitude of approximately 1,060 feet (330 metres), a "false glide slope" was captured. To ensure a stable approach and safe landing, regulations prescribe the 3 degree glide slope; in aviation the term "false glide slope" is used to denote the 6 and 9 degree glide slopes that aircraft are not supposed to follow. The moment the aircraft crossed the false 9 degree glide slope, a pitch-up upset occurred, causing the airspeed of the aircraft to drop despite the autothrottle selecting increased engine thrust. This drop in speed triggered a brief stick shaker warning,[3] after which the flight crew decided to initiate a go-around. During the crew's subsequent recovery procedure the stick shaker was briefly activated a second time. Eventually the crew managed to regain control over the aircraft and, after a successful go-around, to land safely at Eindhoven Airport.

The incident revealed a characteristic of the ILS that had previously been unknown. The ILS is a navigation aid that is used all over the world to facilitate the approach and landing of aircraft. Approximately 1,500 to 2,000 runways all over the world, including runways at all major airports, are equipped with an ILS.

Against the backdrop of these findings, the Dutch Safety Board launched an investigation into the Eindhoven incident, whose gravity and significance were not initially recognized by all the parties involved. Indeed, the Dutch Safety Board itself initially failed to appreciate the potential hazards of incidents of this type. A similar incident had occurred at Amsterdam Airport Schiphol two years before. Although the Dutch Safety Board was aware of the internal investigation conducted by the airline concerned, it saw no reason to launch an investigation at the time into the use of the ILS. Only when it emerged from the investigation of the Eindhoven incident that the event was inconsistent with the existing theories did the Safety Board decide to further examine the ILS.

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[1] The automatic flight system of a Boeing 737-800 consists of the autopilot and the autothrottle.

[2] The autothrottle is used to change the position of the thrust lever in order to achieve the selected thrust or air speed.

3 A stick shaker is warning that is triggered before an aircraft actually "stalls" and the wings provide insufficient lift. The warning offers the crew the time they need to take action and regain control of the situation. In a Boeing 737, this stick shaker warning consists of a strong vibration of the stick combined with a loud rattling noise (shaker).