aibn Accident Investigation Board Norway

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# REPORT SL 2008/10

# REPORT ON SERIOUS INCIDENT OSLO AIRPORT GARDERMOEN, NORWAY, 07.09.2006 BOEING 737-800 OY-SEL OPERATED BY STERLING AIRLINES AND CESSNA 551 CITATION D-IRUP OPERATED BY TRIPLE ALPHA LUFTFARTSGESELLSCHAFT

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*This report has been translated into English and published by the AIBN to facilitate access by international readers.*
*As accurate as the translation might be, the original Norwegian text takes precedence as the report of reference.*

*The Accident Investigation Board has compiled this report for the sole purpose of improving flight safety. The object of any investigation is to identify faults or discrepancies which may endanger flight safety, whether or not these are causal factors in the accident, and to make safety recommendations. It is not the Board's task to apportion blame or liability. Use of this report for any other purpose than for flight safety should be avoided.*

**Photos: AIBN and Trond Isaksen/OSL**

Accident Investigation Board Norway

# REPORT

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This investigation is limited in its extent. For this reason, The AIBN has chosen to use a simplified report format. The ICAO Annex 13 format is only used when the scope of the investigation makes it necessary.

All indications of time in this report are local time (UTC + 2 hours) unless otherwise stated.

| Aircraft: | *OY-SEL* | *D-IRUP* |
|---|---|---|
| - Type and reg.: | Boeing 737-800, OY-SEL | Cessna 551 Citation, D-IRUP |
| - Manufacturing year: | Not reported | Not reported |
| Operator: | Sterling Airlines | Triple Alpha Luftfartgesellschaft mbH |
| Radio call sign: | SNB611T | CLU8000 |
| Date and time: | Torsdag 7. September 2006, at 0748 hrs | |
| Location: | Oslo airport Gardermoen (ENGM), runway 01L | |
| Type of occurrence: | Runway incursion | |
| Degree of seriousness: | Serious air traffic incident | |
| Type of flight: | Commercial, scheduled | Commercial, non-scheduled |
| Weather conditions: | METAR ENGM at 0750 hrs: Wind: 020 ° 5 kt. Visibility: 7 000 m Clouds: Few at 300 ft, scattered at 600 ft, broken at 1 500 ft Temperature/Dewpoint: 10 °C/10 °C, QNH: 1003 hPa. NOSIG | |
| Light conditions: | Daylight | |
| Flight conditions: | VMC | |
| Flight plan: | IFR | IFR |
| Persons on board: | 6 crew members<br>172 passengers | 2 crew members<br>Passengers not reported |
| Injuries to persons: | None | None |
| Damages to aircraft: | None | None |
| Other damage: | None | None |

| | *OY-SEL* | *D-IRUP* |
|---|---|---|
| Commander: | | |
| - Sex and age: | Male, age not reported | Male, age not reported |
| - Licence: | Not reported | CPL, JAR-FCL |
| - Flying experience: | 7 300 hours,<br>of which 2 800 hours on type | 4 500 hours,<br>of which 3 000 hours on type |
| Air traffic controller: | | |
| - Sex and age: | Male, age not reported | |
| Information sources: | Report from the air traffic controller, other reports and documentation from the air traffic services Gardermoen, report from the SNB611T commander (form NF-0148 BE), report from the CLU8000 commander (form NF-0382 E), AIBN's own investigations. | |

## FACTUAL INFORMATION

The incident took place at Oslo airport Gardermoen, on runway 01 Left (RWY 01L). The air traffic controller working "Tower position West" (TWR/W) was responsible for all operations on RWY 01L.

SNB611T was going from Gardermoen (ENGM) to Alicante, Spain (LEAL). CLU8000 was going from ENGM to Billund, Denmark (EKBI).

SNB611T established contact with TWR/W at 07:41:34 and was then cleared to taxi to holding position A1 for departure from RWY 01L.

The flight crew of CLU8000, which was parked on the General Aviation (GA) area, contacted TWR/W at 07:46:39, requesting taxi clearance. The GA area is situated to the west of RWY 01L, (see figure 1). CLU8000 was cleared to holding position C1 for RWY 01L.

SNB611T was given line-up clearance for RWY 01L at 07:47:25, and take-off clearance at 07:48:19. As SNB611T commenced the take-off roll, the air traffic controller observed that CLU8000 had passed beyond holding position C1 and was about to enter RWY 01L. The air traffic controller immediately instructed SNB611T to abort the take-off, which was complied with.

The flight crew of CLU8000 then reported to TWR/W that they had problems checking one of the engines and requested a 180° turn and to return to taxi-holding position C1. The request was refused and the aircraft was cleared to continue on the runway to take the first exit to the left.

SNB611T was subsequently cleared for take-off again.

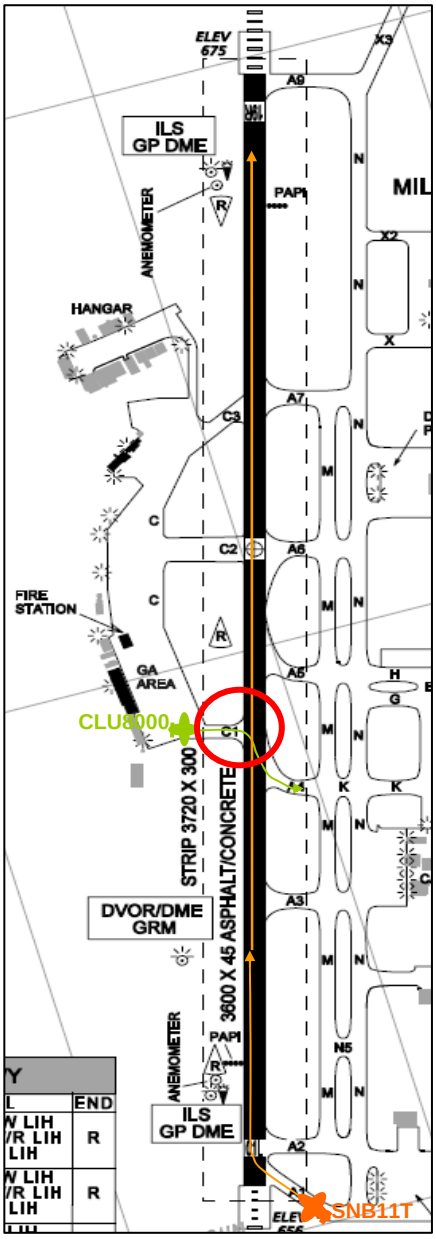


*Figure 1: Map of the western runway at Oslo airport Gardermoen. The movements of SNB611T are marked with orange, and the movements of CLU8000 are marked with green color.*

According to the report from the commander of CLU8000 the aircraft passed the stop light bar by "a couple of meters". In his report the commander of SNB611T states that as he was instructed to abort the take-off, the commander observed an aircraft entering the runway from holding position C1. Radar data recordings have not made it possible to identify how far beyond holding position C1 CLU8000 had proceeded when SNB611T was instructed to abort the take-off.

**Marking and visibility from the control tower**

Holding position C1 is clearly marked with stop bars and signs, as well as surface markings which include the words "RWY AHEAD" (see figure 2).

*Figure 2: Holding position C1 as seen from the GA area.*

Holding position C1 is clearly visible from the TWR/W working position (see figure 3).


*Figure 3: GA area and taxiway/holding position C1 as seen from working position TWR/W in the control tower.*

**Technical equipent and aids**

As far as the investigation board has been able to establish, all relevant equipment and aids on the manoeuvring area and in the control tower were fully operational and functioning normally, both prior to and during the time the incident occurred.

Oslo airport Gardermoen is equipped with a Surface Movement Guidance and Control system (SMGCS), which includes the functionality by which an alert – or warning – is generated, should

the system detect a potential conflict situation on the runway, including inadequate separation between aircraft landing and departing, as well as between aircraft and objects on and within a defined distance from the runway. The alert is generated as a visual indication on the radar display and as an aural alert in the controller's work station. According to the controller in the TWR/W position, no such warning was generated in the situation described.

Playback of radar recordings shows that a visual alert was presented on the air traffic controller's radar display. The AIBN have not found any technical indications that the aural alert was not generated.

**The perception of the CLU8000 commander**

In his report, the commander of CLU8000 states that there were three factors which contributed to the aircraft proceeding beyond the clearance limit of holding position C1.

- The visibility from the cockpit was "not good", as the aircraft was taxiing into a rising sun.

- Checks of the "thrust reversers" (TR) on C500 Series aircraft are required to be performed while the aircraft is taxiing into a head wind in order to avoid exhaust gases entering the cabin. The distance from the General Aviation area to holding position C1 is relatively short. Thus only a limited time was available in which to perform the required checks. The first officer, due to limited experience, had problems performing the thrust reversers checks.

- The commander's attention was being diverted to other tasks.

**Rules and regulations**

ICAO Doc 8168 Aircraft Operations (PANS-OPS), Vol I, Flight Procedures, Part III – Aircraft Operating Procedures, Section 4 – Operational Flight Information, Chapter 1 – Aerodrome Surface Operations is quoted:

> *"1.1 Operators shall develop and implement standard operating procedures (SOPs) for aerodrome surface operations. The development and implementation of SOPs shall take into consideration the risk factors (listed in 1.3)*
>
> *associated with the following operations:*
>
> *a) runway intersection take-offs;*
>
> *b) line-up and wait clearances;*
>
> *c) land and hold-short clearances;*
>
> *d) take-offs from displaced runway thresholds;*
>
> *e) hazards associated with runway crossing traffic;*
>
> *f) hazards associated with runway crossing traffic in the case of closely spaced parallel runways; and*
>
> *g) hazards associated with the risk of collision at hot spot locations on aerodromes.*
>
> …

*1.3 Operators should ensure that flight personnel are aware of the risk factors in the aerodrome surface operations listed in 1.1. Such risk factors should include, but not be limited to:*

*a) human error due to excessive workload, loss of vigilance and fatigue;*

*b) potential distractions associated with the performance of flight deck tasks; and*

*c) failure to use standard phraseology in aeronautical communications."*

**Eurocontrol Action Plan**

Eurocontrol has published "European Action Plan for the Prevention of Runway Incursions." The following recommendations are quoted from chapter 4.4 – Recommendations for Aircraft Operators:

*"4.4.5 Promote best practices on flight deck procedures while taxiing - to include the "Sterile flight deck"concept.*

*4.4.6 Promote best practices for pilots' planning of ground operations."*

Appendix E of the same document Appendix E – Flight Crew Best Practice – quotes:

*"Planning for taxi operations*

*The key-point in the prevention of runway incursions, is to apply better preventative measures during the taxi-phase. Reduced workload will provide for increased attention to the taxi phase and allow an updated and accurate positional and situational awareness. This situation can be further enhanced by assigning one crew member to progressively monitor the progress of the flight against the aerodrome chart.*

*Airport familiarisation*

*Departing from or arriving at an airport can be prepared well in advance. Thorough planning for taxi operation is essential. This preparation should be done at the gate or prior to starting descent.*

- *Prepare the necessary charts for taxi and have them available for use during taxi.*
- *Take some time to study the airport layout.*
- *Use the ATIS information and your previous experience to determine the possible taxi routes.*
- *Remember to review the latest NOTAM for both the Departure and Arrival airport for information concerning construction or taxiway/runway closures. Visualise this information on the charts.*
- *Standard taxi routes are used more often at busy airports. Review the routes you can expect*
- *Pay special attention to the location of HOT SPOTS. These are unique or complex intersections and runway crossings where runway incursions have taken place in the past, or areas of the runway or associated taxi ways which are not visible from the Control Tower. Know what runways you will encounter between where you are and where you are going.*

- *Plan timing and execution of check-lists, so that no distractions occur when approaching and/or crossing runways; i.e. all eyes outside during this phase.*
- *Conduct detailed briefing for all flight crew members, especially during night and low visibility operations i.e. include "extra eyes" where available."*

The complete document can be downloaded from
*http://www.eurocontrol.int/runwaysafety/gallery/content/public/docs/EAPPRI%201_2.pdf*

## COMMENTS OF THE ACCIDENT INVESTIGATION BOARD

The AIBN considers it unlikely that any real danger of collision existed in this incident.

The C1 holding position is marked in accordance with regulations, and the probability of an aircraft passing the position due to poor or inadequate marking is considered unlikely.

### The planning and actions of the crews

The AIBN shares the understanding of the CLU8000 commander regarding elements which may have contributed to the aircraft passing the C1 holding position. The attention of the commander of CLU8000 would seem to have been fixated on the first officer's problems with the checks of the thrust reversers.

When a pilot-in-command (PIC) is aware that the distance to the runway in use is short, and he also knows that the checklist to complete before take-off is extensive, or if other events demand extra attention, it is the responsibility of the PIC to adjust the taxiing to ensure that the runway in use is not entered before the checklist is completed. Having flown 3 000 hours on the type, it is reasonable to consider the PIC of CLU8000 as experienced.

The accident investigation board has not made inquiries about the Triple Alpha Luftfartgesellschaft regarding training programmes or operating procedures, and can therefore not assess whether any deficiencies in these elements exist with the company. Neither the cockpit CRM (Company Resource Management) on the day in question nor the company culture have been evaluated, and there is no reason to assume that human factors apart from those already mentioned, have contributed to the evolving situation. Nevertheless, the AIBN wishes to give a reminder of the importance of good CRM, together with training programmes and procedures which improve air safety.

There has been done a lot of work internationally to prevent runway incursions. The AIBN believes that it would be possible to reduce the number of incidents of the type described in this report if operators carry out training and produce operational procedures in accordance with the recommendations made by Eurocontrol and other equivalent organisations.

The AIBN considers that the flight crew of SNB611T acted in a prompt and correct manner upon being instructed to abort the take-off run. Their action was a contribution in preventing the incident developing into a situation with a potentially far more serious outcome.

## The planning and actions of the air traffic controller, and relevant technical equipment

The air traffic controller on duty acted promptly when he observed that CLU8000 was passing the clearance limit, C1, and instructed SNB611T to abort take-off. The investigation board considers this to be a contributing factor in preventing a more serious outcome.

The air traffic controller did not perceive any visual warning of runway incursion from the SMGCS equipment in the tower. However, playback radar recordings shows that an alert was in fact presented on the radar display. The AIBN finds it likely that the controller gave priority to visually observing the actual traffic, and therefore did not notice the alert on his display in the control tower.

The air traffic controller claims that he did not hear any warning indicating that CLU8000 passed the stop bar. This may be caused by the tone, volume and duration of the warning signal generated was not conspicuous enough to stand out from all the other sounds in the control room. It is also possible that the extent and/or characteristics of the controller's workload made him unconsciously give a lower priority to those sounds not directly concerned with the communication between himself and the aircraft, out of capacity constraints.

The investigation board finds it essential that the characteristics of the aural signal associated with such alerts are such that the warning is perceived and thus serves its purpose, also under stressful conditions. It is also necessary to estimate the presentation of the alert signal in proportion to the likelihood of false alarms. Experience has shown that repeated false alarms can cause irritation, which again can result in neglect or a demand by operational personnel for the elimination of all such alerts.

In a consultative statement to the AIBN, Avinor informs that the company has assessed the existing runway incursion alerts, to judge whether they are sufficiently visible and audible, and whether the air traffic controller receives them in time to prevent critical incidents or accidents on the runway. Avinor says: "*Based on experience and everyday operations, the existing limits/alerts as of today are functioning satisfactorily to prevent and avert a runway incursion.*"