SYNOPSIS

SERIOUS INCIDENT

Aircraft:	
Registration, type	SE-DSV, BAe 146/AVRO 146-RJ
Model	AVRO-RJ 100
Class, Airworthiness	Normal, Certificate of Airworthiness and Valid Airworthiness Review Certificate (ARC[1])
Operator	Braathens Regional Aviation AB (BRA)
Time of occurrence	**7** November 2016, 06:21 hrs during darkness Note: All times are given in Swedish standard time (UTC[2] + 1 hour)
Place	North of Gothenburg/Landvetter Airport, Västra Götaland County, (position 57 72N 012 35E, 3 000 feet above mean sea level)
Type of flight	Commercial Air Transport
Weather	According to SMHI's analysis: wind northeast 15 knots, visibility > 10 km, no clouds below 5 000 feet, temperature/dewpoint -05/-07°C, QNH[3] 1011 hPa
Persons on board:	**55**
crew members including cabin crew	5
passengers	50
Injuries to persons	None
Damage to aircraft	No damage
Other damage	None

[1] ARC – Airworthiness Review Certificate.
[2] UTC - Coordinated Universal Time is a reference for the exact time anywhere in the world.
[3] QNH - Barometric pressure reduced to mean sea level.

SUMMARY

The incident occurred during a commercial flight from Gothenburg/Landvetter Airport. The aeroplane, of the model AVRO 146-RJ 100, was operated by Braathens Regional Aviation AB (BRA). The aeroplane had been parked out-side for approximately 40 hours before the incident and was heavily contaminated with precipitation of snow and ice. A one-step de-icing of wings, stabiliser, rudder and fuselage was ordered by the commander. The de-icing was performed by the subcontracted company Aviator Airport Services Sweden AB (Aviator).

Shortly after take-off, heavy vibrations occurred at an indicated airspeed of around 195 knots. The commander took control of the aeroplane and disconnected the autopilot while the co-pilot made a distress call to air traffic control. The indicated airspeed was reduced whereby the vibrations ceased. The crew then decided to abort the flight and return to the airport. Thereafter, the speed was increased again and the vibrations returned until the speed was reduced a second time. The engineers of the company inspected the airplane after landing and discovered extensive ice coverage on multiple flight control surfaces.

According to the investigation, the aircraft type appears to be sensitive to mass balances in the control system. This means that even very thin layers of ice are sufficient to make the flight control system unbalanced beyond the tolerances specified in the aircraft's approved maintenance manuals. In this case, the ice contaminations on the aircraft were relatively extensive. Against this back-ground, SHK has concluded that the vibrations were due to the unbalance of the elevator system that arose due to the ice contamination.

It is apparent from the investigation that the personnel who were to inspect the aircraft prior to the flight did not detect all ice contamination, which meant the de-icing order did not cover all of the ice contamination, and that there were shortcomings in the de-icing actually carried out.