Cessna 335, N2706X

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Aircraft Type and Registration:	Cessna 335, N2706X
No & Type of Engines:	2 Continental TSIO-520-EB piston engines
Year of Manufacture:	1980
Date & Time (UTC):	17 September 1997 at 1928 hrs
Location:	Norwich Airport, Norfolk
Type of Flight:	Private
Persons on Board:	Crew - 2 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Burst nosewheel tyre, broken nose landing gear strut, propellers damaged, engines shock loaded and aircraft skin punctured and rippled
Commander's Licence:	Private Pilot's Licence with IMC, Night
	and FAA Instrument Rating
Commander's Age:	53 years
Commander's Flying Experience:	789 hours (of which 107 were on type)
	Last 90 days - 27 hours
	Last 28 days - 4 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by AAIB

The pilot had carried out practice instrument approaches and hadlanded at Norwich earlier in the day. A friend, who was an experiencedpilot, occupied the right-hand seat to act as safety lookout. The return flight to Elstree was planned for that night. Weatherconditions were good with visibility in excess of 10 km, cloudscattered at 3000 feet and a surface wind of 080°/04 kt. The pilot described the conditions as very clear and said thatthere was no misting of the aircraft's canopy.

Runway 27 was in use and the pilot reported that he lined-up theaircraft on the runway centreline and commenced the take off. At about 60 kt there was a jolt, the aircraft nose dropped andthe propellers struck the ground. The aircraft then veered tothe left and came to rest on the grass. There

was no fire andneither of the occupants was injured. Air Traffic Control observedthe initial take-off run and subsequent deceleration, and despatchedthe fire vehicles when the aircraft pilot confirmed there wasa problem.

Examination by the Maintenance Manager revealed that two edgelights on the southern edge of the runway had been damaged bythe aircraft These lights were white (or amber, as required byrunway direction) and stood approximately 14 inches high. Tyremarks indicative of a deflating tyre were evident from the pointof impact with the first light until they ran off the runway ingentle curve. In conjunction with marks in the grass they wereconsistent with the damage to the lights caused by the nosewheeland nose landing gear collapse having occurred after the aircraftran onto the grass. Both mainwheel tyres appeared undamaged.

Runway Dimensions and Airfield Lighting

Runway 27 at Norwich has a tarmac shoulder of approximately thesame width as the runway on its southern edge. The shoulder extendsfor approximately 242 metres from the runway threshold and itsboundary with the runway is designated by a broad white line. The line was added when the runway was resurfaced in March/April1997 but had not been in place before that date; it continuesbeyond the shoulder as the runway edge line. Three sunken, bi-directionallights are located at intervals alongside the line between therunway and the shoulder. The first runway edge light is situatedapproximately 12 metres beyond the end of the shoulder.

The taxiway leading to the threshold of Runway 27 has centrelinegreen lights which were installed when the runway was resurfaced. They continue onto the shoulder, at right-angles to the runway,but stop approximately 13 metres short of the boundary betweenthe shoulder and the runway. They were in use at the time ofthe accident but a section of approximately 90 metres immediatelybeyond Holding Point 'A' was not illuminated because further wiringinstallation is required in that area in association with stop-barlighting.

Unidirectional green 'turning circle' lights have been installedand provide lead-on indications from the end of the taxiway centreline. However, they were not in service at the time of the accidentbecause of technical difficulties which have not been resolvedat the time of this report. Furthermore, both the taxiway centrelineand turning-circle lighting are intended for use in low visibilityoperations (less than 400 metres) and would not normally be usedfor departures in good weather.

The runway centreline lights had been renewed when the runwaywas resurfaced in April 1997 but had not been returned to serviceat the time of the accident.

Aircraft Position

The take-off run for a Cessna 335 at its MTWA of 5,996 lbs is564 metres in still air. The subject aircraft, which was at approximately5,280 lbs, would have covered at least 200 metres to achieve theairspeed (60 kt) at which the jolt occurred. It is unlikely,therefore, that there would then have been sufficient space forit to turn left from the runway centreline following the jolt,then right to parallel the runway, before striking the first edgelight. There were no witness marks on the runway which mighthave indicated such a sharp turn.

Notwithstanding the commander's report that he had lined up onthe runway centreline it is therefore likely that the take-offwas initiated in line with the runway edge.

Previous Recommendations and Actions

There have been 13 reported similar incidents at Norwich and otherairfields where the paved surface extends beyond the runway width. The AAIB recommended in 1991 that the CAA should carry out anaudit with a view to standardising surface markings and lightingat those airfields. CAP 168 (Licensing of Aerodromes), as amendedNovember 1994, illustrates taxiway markings which continue acrossthe shoulder to the runway edge and which should therefore removea source of confusion.

Follow-up Actions

Following the accident, Airport Management withdrew the taxiwaycentreline lights from service pending a full review of the turningcircle, taxiway and lead-on lighting and markings at the runwaythresholds.