aibn Accident Investigation Board Norway

Issued February 2011

REPORT SL 2011/06

REPORT ON AIR ACCIDENT AT HONNINGSVÅG AIRPORT VALAN ON 12 JULY 2010 INVOLVING LANCAIR LEGACY 2000, LX-DIN

Accident Investigation Board Norway • P.O. Box 213, N-2001 Lillestrøm, Norway • Phone: + 47 63 89 63 00 • Fax: + 47 63 89 63 01
www.aibn.no • post@aibn.no

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

REPORT

Accident Investigation Board of Norway (AIBN)
P.O. Box 213
N-2001 Lillestrøm
Telephone: +47 63 89 63 00
Fax: +47 63 89 63 01
http://www.aibn.no
E-mail: post@aibn.no

Date: 24.02.2011
SL Report: 2011/06

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.

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

Aircraft:	
- Type and reg.:	Lancair Legacy 2000, LX-DIN
- Manufacturing year:	2003
Operator:	Private
Date and time:	Monday, 12 July 2010 at 1245 hours
Location:	Honningsvåg Airport Valan (ENHV), Norway
ATS airspace:	Traffic information zone (Valan TIZ), uncontrolled airspace class G
Type of occurrence:	Accident, runway excursion
Type of operation:	Private
Weather conditions:	METAR ENHV 0950UTC 17013G23KT 120V230 9999 SCT043 BKN063 16/09 Q1008= SPECI ENHV 121013UTC 17017G30KT 110V210 9999 SCT043 BKN057 16/09 Q1008=
Light conditions:	Daylight
Flying conditions:	VMC
Flight plan:	VFR
Persons on board:	2 (commander + passenger)
Personal injury:	None
Damage to aircraft:	Damage to propeller and left wing leading edge
Other damage:	Approach light mast broken
Commander:	
- Sex and age:	Male, 53 years old
- Licence:	PPL(A)
- Pilot experience:	Total flight hours: 900 hours, of which 800 on the aircraft type in question. Last 90 days: 20 hours. Last 24 hours: 5 hours.
Information sources:	”NF-2007 Accident/Incident/Occurrence reporting in civil aviation” from the commander, reports from Avinor and AIBN's own investigations.

FACTUAL INFORMATION

LX-DIN was the first of a group of nine aircraft arriving from Rovaniemi, Finland (EFRO) scheduled to land on Valan. The aircraft had to circle the airport a few times while an inspection car finished its task on the runway. Runway 26 was in use (cf. appendix).

According to Avinor, the anemometer on the threshold of runway 26 showed that the main wind direction for the period was from 170 degrees, with variations between 130 – 240 degrees. The mean wind strength in the final two minutes was from 14 to 21 kt, with gusts of up to 33 kt. Both LX-DIN and two other aircraft that had checked in on the frequency were informed that the wind speed exceeded the limit of 20 kt which applied to regular air traffic. The Aerodrome Flight Information Service (AFIS) officer has stated that he transmitted the mean wind value several times, and that the arriving pilots acknowledged receipt.

The airport routinely heightened the alert level when the wind exceeded 20 kt from the south. In the final radio transmission prior to LX-DIN landing, it was stated that the wind was from 170 degrees at 17 kt, varying between 140 and 210 degrees, and that the maximum recorded wind speed during the final two minutes was 23 kt.

The commander on LX-DIN has explained that he approached the airport from the north at 2 000 ft. As sudden gusts of wind and a varying wind direction were observed and forecast, he increased the approach speed and maintained a speed of around 100 kt for the final part of the approach. Full flaps (40°) were applied. The commander has stated that the required rolling distance according to the manufacturer is 300 m for ”standard” landings for the mass in this case, full flaps and indicated airspeed of 80 kt over the runway threshold in no wind. The commander himself had a habit of using 400 m in his calculations, and he had formerly landed LX-DIN in more than 25 kt of crosswind without problems.

The commander has furthermore explained that he did not notice any gusts of wind or turbulence during the approach or landing, and that the touchdown was where it should be. He pulled the throttle to idle and applied brakes as usual. However, the retardation was almost unnoticeable; he has explained that he felt as if the aircraft was being pushed forward by the wind. Midway down the runway he considered pushing the throttle for a go-around, but deemed it safer not to as he doubted whether the remaining runway length was sufficient to make a safe lift-off.

The speed fell after a while, but the aircraft did not have time to stop before reaching the end of the runway, rolling off the end and onto the sloping and stony surface of the runway extension (see Figure 1). The propeller hit a stone and the left wing a light mast before stopping. The two persons on board were not injured.

Figure 1: LX-DIN photographed after running off in the area near the extension of runway 26.

Figure 2: Honningsvåg airport in the autumn of 2010 (seen towards the northeast).

The commander has explained that there was no indication of anything being wrong with the brakes or any other aircraft systems. He believes the excursion was due to the tailwind while the aircraft was on the runway.

The AFIS officer saw the approach and the landing and has explained that the approach looked completely stable and that the landing seemed fine. The aircraft may have bounced slightly before contacting fully with the ground, but it touched down in the correct place, in the touch down zone. The AFIS officer noted the landing time and did not follow the aircraft with his eyes after it passed taxiway B. The speed at the time may have been a little high, but not alarmingly so in his opinion. He only became aware that something was wrong when he saw the fire truck drive onto the runway after the aircraft, and he then saw LX-DIN positioned outside the runway end to the west.

The fuel tank was damaged in the collision with the light mast, and some fuel was leaking from the aircraft. The airport fire and rescue service covered the area in foam and secured it. The police and an ambulance also arrived. The AFIS officer notified the other aircraft in the group and transferred them to the Bodø frequency. All the other aircraft landed at Mehamn airport (ENMH), approximately 33 NM east of Valan.

Honningsvåg airport is known to be challenging. For example, on 29 October 1990, a military Twin Otter hit heavy turbulence just before landing at 26 and crashed 100 metres from the runway threshold. Three people died in the accident.

The regional airline Widerøe's Flyveselskap has stated to the Accident Investigation Board that they operate with an upper limit of 20 kt for approach and landing, including wind gust speed over the last two minutes when the wind is coming from between 140°-200°. When the wind direction varies more than 60° within or in this sector, the limit is 15 kt. The air ambulance operator Lufttransport has adopted similar restrictions.

The following text is from a press release the Civil Aviation Authority published in 2001 in connection with a temporary revocation of the approval for operations with larger aircraft on the airport due to unsatisfactory safety areas:

"… the operational conditions at the airport [are] very difficult due to topography and local weather and wind conditions."

The available landing distance at Valan is 800 m. The runway surface is asphalt for a length of 920 m and a width of 30 m. The threshold height for runway 26 is 13.3 m above mean sea level (AMSL), while it is 6.9 m AMSL at the opposite end. Runway 26 has a 1.2% downwards slope for the first two-third of the runway.

The following caution related to turbulence and southern winds have been published in AIP Norway:

Advarsel	**4**	**Caution**
Turbulens/vindskjær/fallvinder kan forekomme på APCH til/DEP fra RWY 08 og RWY26 ved vind fra S. Dette kan påvirke ACFT styrbarhet og yteevne under stigning. Forsiktighet må utvises ved TKOF eller APCH til RWY 08/26 ved vind fra S over 20 KT. - LDG RWY08: vind fra S, over 20KT, kan forårsake vindskjær/turbulens på finale RWY08, - LDG RWY26: vind fra S, over 25KT, kan forårsake variabel vind på finale RWY26, og fallvinder på kort finale, - DEP RWY08: vind fra S, over 27KT, kan forårsake variabel vind og fallvinder i TKOF sektor RWY08, - DEP RWY26: vind fra S, over 27KT, kan forårsake variabel vind og fallvinder i TKOF sektor RWY26.	4.1	Turbulence/wind shear/down draft may occur on APCH to/DEP from RWY 08 and RWY 26 when wind from S. This may influence ACFT controllability and climb performance. Caution must be exercised during TKOF or APCH to RWY 08/26 with southerly wind more than 20KT. - LDG RWY08: wind from S, above 20KT, may create windshear/turbulence on final RWY08, - LDG RWY26: wind from S, above 25KT, may create variable wind on final RWY26, and downdrafts on short final, - DEP RWY08: wind from S, above 27KT, may create variable wind and down draft in TKOF sector RWY08, - DEP RWY26: wind from S, above 27KT, may create variable wind and down draft in TKOF sector RWY26.

In recent years, Honningsvåg airport has invested substantial amounts to improve safety at the airport. According to the airport management, the measures include an upgrade of the safety areas in accordance with BSL E 3-2, new approach equipment and aids have been acquired (localiser,

directional beacon and VHF direction finding station), new asphalt has been laid and marking lights for aiming points and centre line installed. A new tower is under construction, and more equipment will be replaced immediately once the building has been completed.

This was the commander's first time in Norway and his first landing in Norway. He usually operates on longer runways in less demanding terrain. The commander has stated that he and the other pilots in the group had read the Norwegian 2010 VFR-guide, visited the Avinor IPPC (Internet Pilot Planning Center) and studied AIP Norway when planning the flight. He had noted the wind cautions for Honningsvåg. The commander on LX-DIN has explained to the AIBN that the radio correspondence gave him the impression that the wind almost reached the upper limit for when the airport would close.

After the accident, the commander has openly shared his reflections on how similar occurrences can be prevented. Landing in conditions where the wind shifts between tailwind and headwind must be avoided, in his opinion, while variations from headwind to crosswind would be acceptable. The maximum permitted crosswind would depend on the aircraft type and the pilot's experience. He would prefer landing uphill if possible in crosswinds, although AFIS stated that the opposite runway was in use. Furthermore, he pointed out that a decision to discontinue the landing would have to be made very quickly, based on an assessment of the speed and remaining runway length. He also mentioned reduced brake effect as a result of a wet or dusty runway, and concluded that all potential factors must be considered when deciding whether to land or cancel and proceed to an alternative airport.

The Accident Investigation Board has been informed by the AFIS that they, in their evaluation after the incident have seen that it might be a good idea to reminding light visiting aircraft of the slope of the runway when wind conditions otherwise permit landing in both directions.

Airports do not normally close due to high wind speeds. Valan closes only when the tower must be evacuated, which usually happens at wind speeds of about 60 kt.

COMMENTS FROM THE ACCIDENT INVESTIGATION BOARD

In this case, the ground roll exceeded the available landing distance, in spite of touching down in the landing zone. The light mast and the stony surface contributed to the damage to the aircraft although it did not go far off the end of the runway, and also had a relatively low speed. High airspeed, runway slope, brake effect and tailwind are all factors that can increase the stop length. The tendency for bouncy landings also postpones the start of the effective braking. The brake length increases with the velocity squared, indicating that an increase in the landing speed from 80 to 100 kt (25%) will increase the brake length by 56%. The Accident Investigation Board has not carried out any detailed calculations of how much effect the various factors had in this case, but does not consider it unlikely that the aircraft was exposed to tailwind after landing as explained by the commander.

The Accident Investigation Board believes that the preparations for this flight were as can be expected when private pilots land at an unfamiliar airport. The commander had studied both the VFR Norway guide which encourages a safety mindset and describes general challenges, IPPC and AIP Norway which contains specific cautions for the individual airports.

The AFIS officer carried out his task of informing and warning about the wind, as well as heightening the alert level. It is up to the commander to consider whether approaching and landing

is safe. Many pilots would probably have assessed the situation like the commander on LX-DIN and the rest of the group did. They expect that they can master the conditions, at least have a go and if necessary break off the approach.

As regards contributing factors, the Accident Investigation Board believes a transmission via radio stating that the wind exceeds what professional players have set as their limit in effect states that landing is inadvisable. The challenge, however, is to make those involved understand the hazards they are exposing themselves to. This can in particular apply to pilots with no experience of flying in mountainous areas with heavy winds. An 800-metre long, fully equipped runway with asphalt surface and wind speeds of 25 kt do not automatically deter experienced private pilots. The AIBN believes there is a need for considering stronger measures to prevent accidents in potentially dangerous wind conditions at Honningsvåg airport Valan.

A rule of thumb for pilots of light aircraft is to increase the approach speed by half the speed of the wind gusts, maximum 10 kt. Under the prevailing conditions at Valan on 12 July, with risk of wind shear at the final approach, it should not be taken for granted that higher approach speed will give sufficient margins. Improvements and investments made at the airport contribute to improved safety, but the terrain-induced wind conditions remain the same. A runway overrun with limited material damage can in this perspective be considered a mild lesson learned.

SAFETY RECOMMENDATIONS

The Accident Investigation Board Norway (AIBN) makes the following safety recommendation[1]:

SL Safety Recommendation no. 2011/01T

The mountainous terrain surrounding Honningsvåg airport induces particularly demanding wind conditions and risk of wind shear in southerly winds. Cautions are given in AIP Norway. The commercial operators regularly operating at the airport have established restrictions that imply that flights are cancelled when certain wind directions and strengths are reported. These are conditions that do not necessarily deter visiting pilots who are unfamiliar with local conditions.

The AIBN recommends the Civil Aviation Authority-Norway, in co-operation with Avinor, to consider whether measures that more clearly advices visiting aircraft to refrain from using the airport in potentially dangerous wind conditions should be implemented.

The Accident Investigation Board of Norway

Lillestrøm, 24. Februar 2011

Appendix: AIP Norge Aerodrome Chart Honningsvåg Valan

[1] The Ministry of Transport and Communications ensures that safety recommendations are presented to the aviation authorities and/or other affected ministries for assessment and follow-up, cf. Section 17 of the Regulations relating to public investigation of air traffic accidents and incidents in civil aviation.

AERODROME CHART

71°00'35"N 025°59'01"E WGS 84

AD ELEV 46 FT

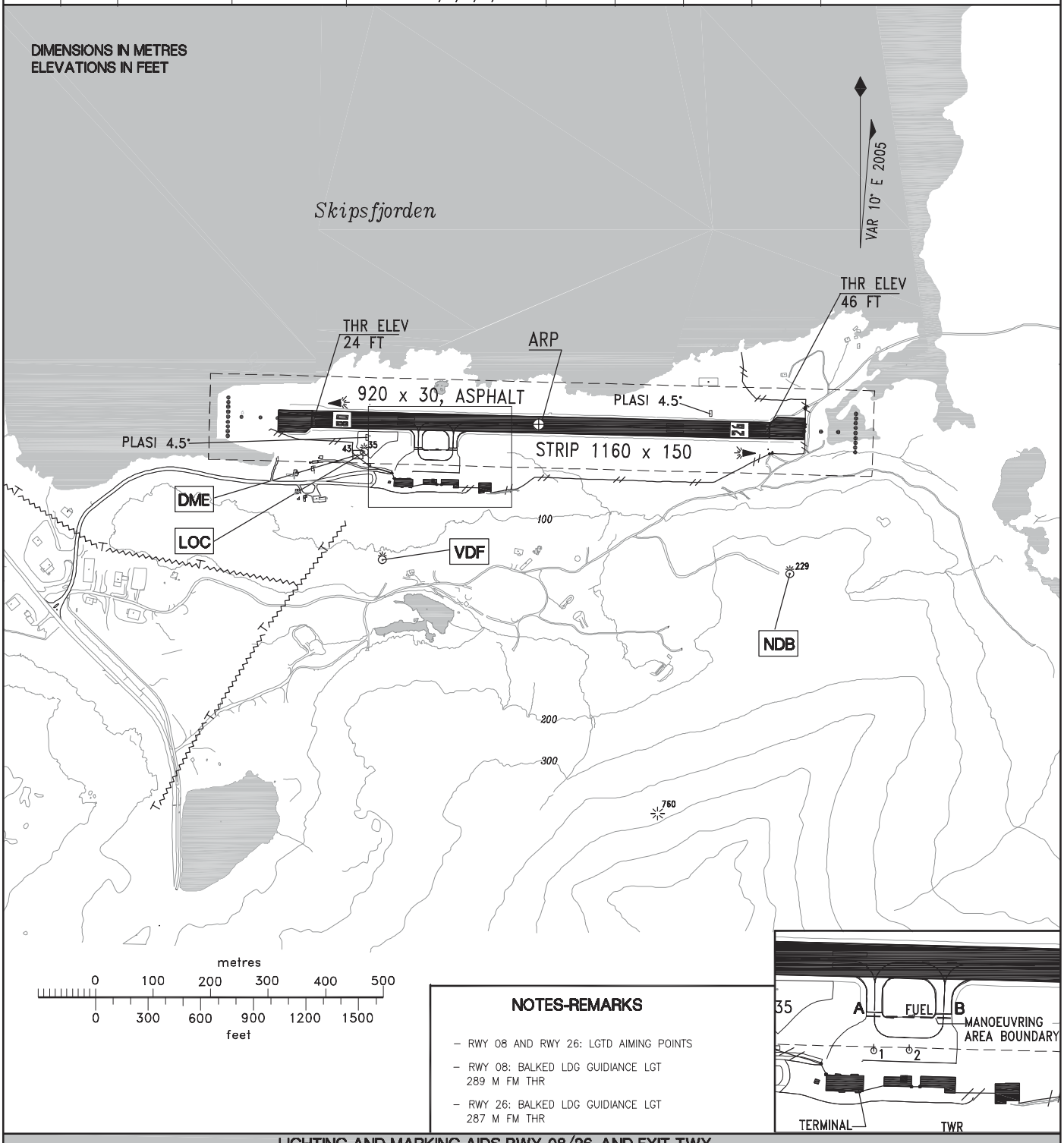
AFIS 119.800 MHz

HONNINGSVÅG VALAN

NORWAY

RWY	BRG (GEO)	THRESHOLD		BEARING STRENGTH	DECLARED DISTANCES				TWY AND APRON
					TORA	ASDA	TODA	LDA	
08	090.50°	710034.98 N	0255822.20 E	PCN – 20/F/B/X/U	860	860	860	800	TWY A AND B: WID 15M, ASPH PCN – 20/F/B/X/U
26	270.53°	710034.74 N	0255941.46 E	PCN – 20/F/B/X/U	860	860	860	800	APRON: ASPH, PCN – 15/F/B/X/U

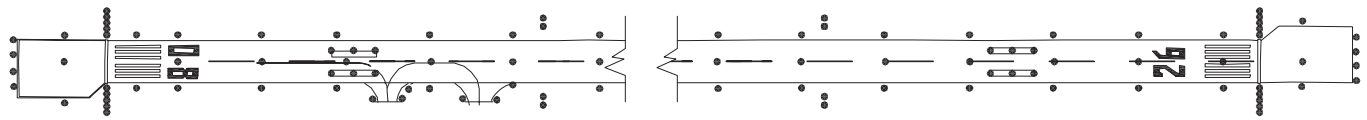
DIMENSIONS IN METRES
ELEVATIONS IN FEET



NOTES-REMARKS

- RWY 08 AND RWY 26: LGTD AIMING POINTS
- RWY 08: BALKED LDG GUIDIANCE LGT 289 M FM THR
- RWY 26: BALKED LDG GUIDIANCE LGT 287 M FM THR

LIGHTING AND MARKING AIDS RWY 08/26 AND EXIT TWY



RWY	APCH	THR	PLASI	RWY CL	EDGE	END	RWY	APCH	THR	PLASI	RWY CL	EDGE	END
08	W CL/XBAR LIH/L	G LIH	4.5° MEHT 24FT	800M W/56M LIL	600M W/200M Y LIL	R LIH	26	W CL/XBAR LIH/L	G LIH	4.5° MEHT 20FT	800M W/56M LIL	600M W/200M Y LIL	R LIH

CHANGES: NEW ELEV DUE TO NEW GEOID MODEL, INCREASED RWY DMN SFC, DECL. DIST., MOVED RWY EDGE LGT, MOVED XBAR RWY 08 AND EDITORIAL