Rapport nr. 15/2020

Fakta:

Dato:	29.07.2020, kl 17:40
Type hendelse:	Forsert landing før baneenden
Fly:	LS8-18, LN-GCG
Sted:	ENOP
Pilot:	EASA SPL
Vær:	7 kt, 180 grader. Temperatur 18 °C og QNH 995 hPa. Spredte skyer og god sikt. Skybas 6000 fot. Mindre lokal bygeaktivitet.
Antall ombord:	1
Personskader:	Kutt i tommel
Skader på fly:	Ja

Konklusjon:

Kryssing av fjellparti betyr generelt flyging over ulandbart område. Ved flyging over ulandbart terreng, mot kjent landbart område, må nødvendig sikkerhetsmargin medregnes.

Det vil si at underveis må man kalkulere når man skal snu og gå tilbake til siste utelandingsjorde eller man kan fortsette videre med god margin.

Hendelse:

Hendelsen skjedde under organisert seilflyging på ENOP. Dette var fartøysjefens andre flyging denne dagen. Turen var en strekktur i områdene vest, og sør-øst for flyplassen. Fartøysjefen krysser over fjellparti fra Kvikne i retning ENOP, og finner ikke sitt valgte utelandingsjorde ved ankomst til dalen der flyplassen ligger. Fartøysjefen flyr da videre mot flyplassen og nødlander til slutt i skogen ca 450 meter fra terskel baneende 25.

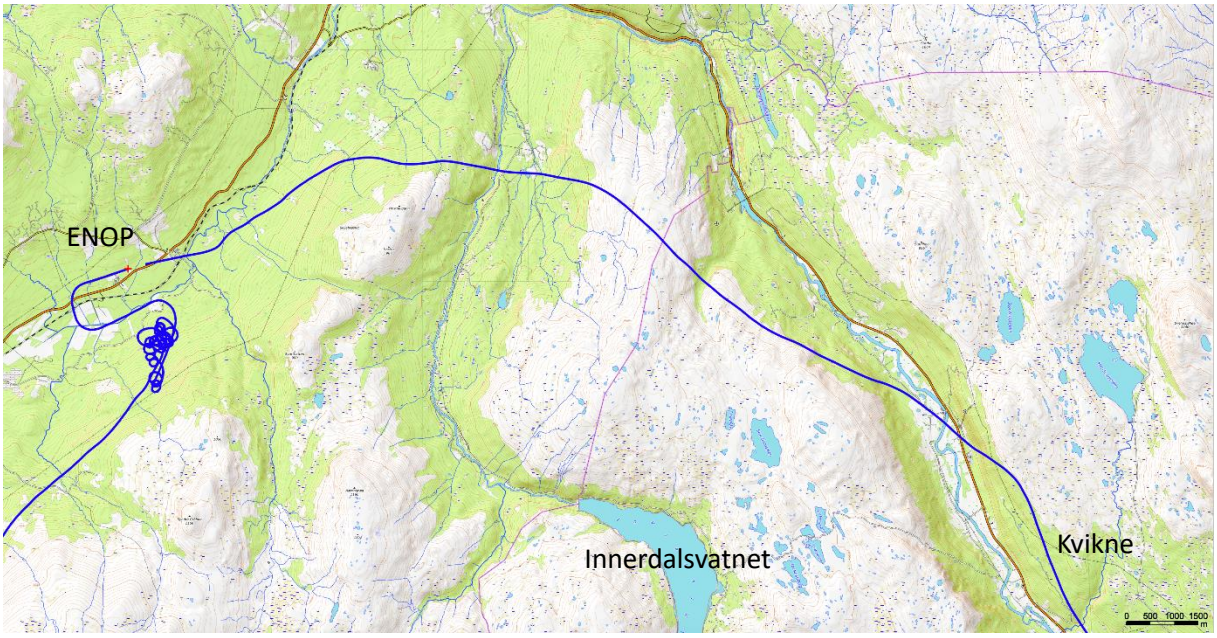

Fig 1: Track fra flightcomputer. Takeoff og start på turen mot vest, og turens siste del med retur fra øst.

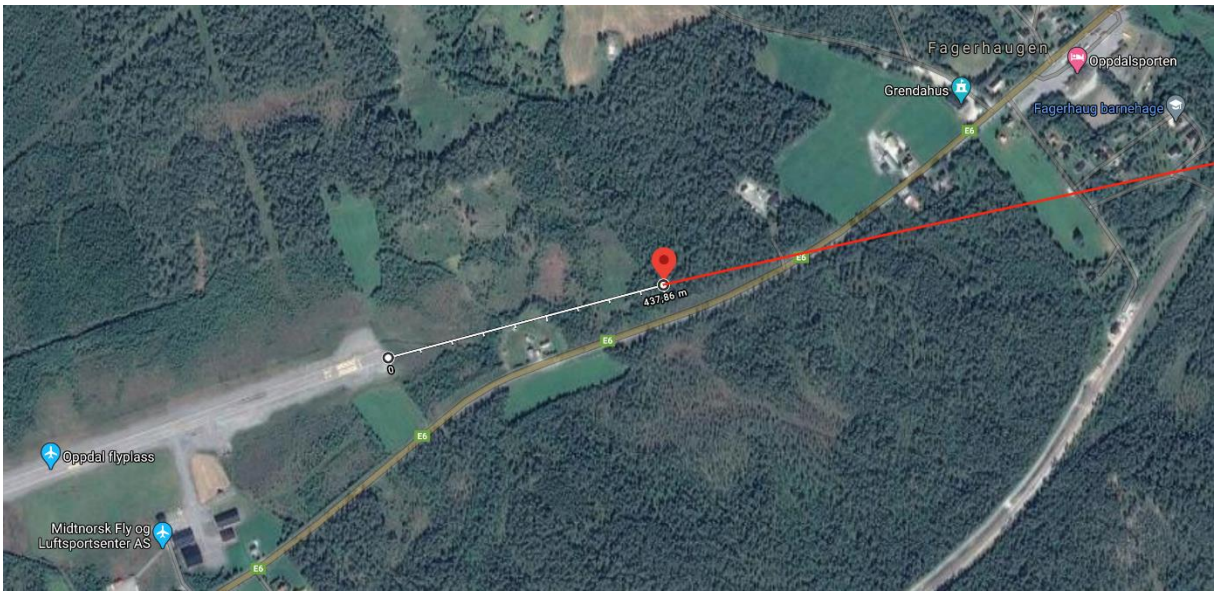

Fig 2: Utsnitt fra Google Maps, anmerket havaristed (rød markør), avstand (hvit), samt siste del av flightrecorder track (rød strek)

Beskrivelse av vær:

Vind: 7 kt, 180 grader.
Temperatur 18 °C
Lufttrykk: QNH 995 hPa.
Skyer: Spredte skyer og skybas 6000 fot
Sikt: god sikt (9999)
Nedbør: lokal bygeaktivitet

Fartøysjefen:

Fartøysjefen var 31 år og fransk statsborger.

Fartøysjefen hadde EASA SPL. Total flytid 1539 timer, hvorav 29 timer siste 90 dager, og 6 timer siste 24 timer. Total flytid på aktuell type 75 timer.

Han har gjennomført sin utdanning og konvertering til EASA SPL i Frankrike. EASA SPL med FI(S) rettighet utstedt 20/11/2015. EASA medical godkjent 15/04/2017, påført gyldighet til 15/04/2022. Fartøysjefen hadde gyldig EASA SPL, gyldig medical, og oppfylte EASAs gjeldene krav til recency for å fly som fartøysjef.

Fartøysjefen har erfaring fra fjellflyging i St. Auban i alpene, samt instruktørutdanning fra St. Crepin, og (anslått) rundt 100 timer erfaring med strekkflyging i alpene.

Teknisk undersøkelse:

Den tekniske undersøkelsen etter hendelsen ble utført av seilflytekniker/byggeleder, men begrenset seg til skadeomfang, da det ikke forelå noen indikasjon på teknisk svik.

Flyet fikk store materielle skader i havariet.

Fig 3: Skader på flyet

Konklusjon teknisk:

Det ble ikke avdekket feil på flyet som kunne ha vært der før hendelsen, og som kunne ha medvirket til hendelsen.

Diverse Instrukser NTNUF:

a) Bruk av klubbens fly

Fartøysjefen oppfylte klubbens krav til bruk av klubbens seilfly.

b) Instruks for strekkflyging

Fartøysjefen oppfylte klubbens krav for strekkflyging fra ENOP.

Hendelsen beskrevet av fartøysjef:

De følgende avsnittene er gjengitt på engelsk, med fartøysjefens egne ord.

«I was planning to fly just for one day as the weather forecast was promising for a cross-country flight. I woke up at 7, drove from Trondheim, and arrived at the airfield around 9. I took the first tow of the day and did a first cross-country flight of approximately 250 km, flying North to Orkanger, Snota and back. This was new to me: I had never flown so far North, as airspace restrictions usually

make it difficult. However, it was quite easy that day: cloud base was only around 1600m, which is the limit of the C-class airspace, but thermals were better than usual and strong energy lines made it easy to stay at the top. I wanted to continue towards the East but conditions weakened, I went a bit low, and had to turn around. I finally landed at the airfield at 14:15 as I did not find any lift on the way back. During this flight, I had noticed a landable field at the end of the Orkdalen valley that I considered using, but I was high enough to go back to the airfield with a good margin.

After landing, I was not necessarily willing to fly again: I had a short but very nice flight (much better than expected), the conditions were deteriorating and rain was forecasted from 15:00 onwards. However, it was still very early, the sky looked promising in the South, an there was no one waiting for the tow plane, so after a quick discussion with the instructor I decided to take off again right away for another short cross-country flight.

I took off at 14:27. The beginning of the flight went well, with strong thermals and higher cloud bases. I flew first SouthWest to Snøhetta, then NorthWest to Sunndal. Further West, conditions were clearly deteriorating with low clouds and thunderstorms. I went back to Oppdal easily, following the valley and a cloud street. There was some overdevelopment and I was under some rain for almost 20 km, but I was still climbing in a straight line most of the time. To move away from the rain, I then decided to keep going South-East towards Tynnset, where it was still very sunny. However, I did not find any good lift on the way, and when I reached the Orkdalen valley, I was already quite low, at 1300m. I quickly realized that the conditions were much weaker there, whith what seemed like a completely different air mass, much more stable, with weak thermals and lower cloud bases. I immediately dropped the idea of going to Tynnset and started to think that going home would be difficult. I was annoyed that I flew in this area while it was probably better further north, but at the same time I was not too worried as there are many landable fields in the valley, and I knew that other pilots were sleeping at the airfield this evening so it would not be a big hassle in case of outlanding. Still, I managed to find a weak thermal to climb back to 1500m, and there were some cumulus further north, so I relaxed a bit and started on the way home following the valley to the North. I found other thrmals, climbed to 1700m and I remember thinking that it turned out easier than expected.

At that time, I still had 30km to go and my GPS indicated an arrival altitude of +200m, so I was almost certain that I would make it back. For this calculation, I am using a rather conservative setting of 1.5 MC + 20% polar degradation factor (which in this situation, after accounting for the wind etc., gave a L/D ratio of about 27 for the LS8-18, compared to a theoretical maximum of 50). I have been using this empirical setting for more than 10 years, in many different gliders, and always experienced reaching the airfield confortably. At the same time, I am aware that even if this represents a conservative approximation of real life gliding performance, it does not provide a 100% safe gliding range, so it should not be used in situations where raching the target is critical for safety. Therefore, I usually start my final glide with this setting, but follow the evolution of the altitude margin as I get closer to the airfield, to make sure that I am on a 100% safe trajectory before leaving the last outlanding possibility and commiting to the airfield. Another factor that might have had an influence is that I usually use SeeYou as my main GPS and calculator, but it stopped working at the beginnig of the flight, so I was using XCSoar on my mobile. I frequently use it as a back-up, with the same settings, but I am less familiar with it. On that day, the begining of the finalglide was OK, with a succesion of weak lift and sink areas, but the security margin was not really improving. As I was about to leave the area with the best outlanding possibilities, I had to make a decision. There were some faint cumulus clouds, but they were further north-east, so I felt that it would only make it worse and might compromise my only chance of coming home. My options were then to stop and most probably land in a field in Orkdalen, or keep going to the airfield, which I was not 100 % sure I would reach. However, I remembered the landable field I saw at the end of the first flight. It was not listed as a landable waypoint in my GPS (probably because it is too close to Oppdal), but it looked perfectly fine. I could not see it as it was on the other side of the hills, but I was certain to be in reach, so I decided to keep flying towards the airfield, with the option to outland there if needed. I then left the Orkdalen

and focused on clearing the hills between me and the airfield without making too much detour, which in volved taking a direct route, flying low above terrain, instead of following the valley until the end.

At that point, the situation was not looking great and there was some sink, but I remained optimistic as I had enough altitude to make it to the valley with the E6 and the airfield, and I have very often experienced lift on the other side of the hills in the evening. However, when I arrived on the other side and finally had a better view, I could see the airfield, but not the outlanding field. In retrospect, I think it must have been further north, meaning that I would have needed to turn to the right and away from the airfield to be able to see it, while I was expecting it to be on the way to the airfield. I was low and it started to sink more, so I did not take time to look around. The only other option I saw was a patch of very small fields surrounded by trees in the direction of the airfield. In lack of a better option, I continued towards the airfield, thinking that I could make the decision to turn right to base for the fields if needed. But as I was in the "downwind" for the field, I estimated that it was very short, and that the approach was difficult and I would have to land with a tailwind. This made me afraid to commit to the field knowing that it would probably go wrong somehow. I have made many outlandings in the past (about 30), but never in Norway and the last time was in 2017, so it might have an influence.

I hesitated a few seconds, until it was too late.The field was now behind, I thought that the airfield was the only option left, so I said in the radio that I was coming very low and asked to clear the runway. At the same time, it was still sinking, I also had the impression that the wind was stronger than I expected, and it became more and more clear that I was not going to make it. To limit sink, I tried to trade the little altitude I had left for some speed and was flying just above the trees. I had to pull once to avoid a tree, and after that I just tried to go on as long as I could, continuously pulling with speed going down, until I reached the stalling speed. The glider slowly started to stall, I lost maybe 2 meters before the left wing tip hurt a tree top. The glider turned approximately 90 degrees to the left, hit other branches and stopped about 4 meters up in the trees for one second. Then it dived again and the nose hit the ground at an approximately 45 degrees angle. The final impact broke the canopy but was not very violent as speed was limited and the forest soil was mossy and soft. I was afraid that my legs would get crushed, but the tip of the fuselage was not compressed. My belt was well tightened and I did not hit anything in the cockpit as minor objects (GPS, food, etc.) were projected to the front. I did not feel any pain or injury, so I released the belt, went out, and notified by radio that I was OK. I met first a cyclist who saw the glider falling from the E6, before the first person from the airfield came a few seconds after.

Intervju av fartøysjef:

Fartøysjef ble intervjuet etter hendelsen. Han ga en grundig og god beskrivelse av hvordan han hadde flydd og hans oppfattelse av hendelsesforløpet. Dette sammenfaller med det han tidligere har skrevet i sin skriftlige rapport.

Han understreker at været var tildels bra for seilflying, men at forholdene raskt ble vesentlig dårligere da han ankom dalen ved Kvikne. Han forkastet ett østligere sporvalg grunnet enda lavere skybas mot øst fra Kvikne, selv om forholdene så bedre ut.

Fartøysjefens valg om å ikke utelande like nord av Kvikne, men starte kryssing over fjellpartiet fra Kvikne til Oppdal var basert på flere momenter. Fartøysjefens erfaring med strekkflyging tilsa at kryssing skulle være mulig, gitt de forholdene han hadde flydd i så langt. Indikert overhøyde til flyplassen på personlig seilflycomputer tilsa at sikker kryssing var mulig. Tidligere erfaring om at seilflycomputer alltid var konservativ i sin beregning forsterket inntrykket om at sikker kryssing var mulig.

Etter hvert som fartøysjefen fløy mot ENOP fikk han aldri den forventede økningen i overhøyde som seilflycomputeren har brukt å gi. Når fartøysjefen innser dette, er han allerede for langt inne på fjellet til å snu tilbake mot Kvikne. Når han ankommer dalen nær ENOP, er han allerede lavt og finner ikke

utelandingsjordet. Han er også for lavt til å nå to andre landbare områder – ett på motsatt side av dalen, samt ett rett ved flyplassen.

Fartøysjefen forteller videre at han setter kursen i retning flyplassen, men innser at han ikke har høyde nok til å nå over skogen. Han reduserer da hastigheten ned mot minimum for å minske energien ved sammenstøt med skogen.

Fartøysjefen vektlegger under intervjuet selv at hans erfaringsnivå trolig er en medvirkende årsak til at han ikke hadde nødvendig sikkerhetsmargin. Dette har i så måte vært en vekker for fartøysjefen.

Fartøysjefen understreker også at det ikke var noen ekstra stressfaktorer som tilsa at han *måtte* unngå utelanding på denne turen. Det var ingen som ventet på flyet, ingen ventet med ferdig middag, og ingen virket stresset med å komme seg hjem fra flyplassen. Før take-off hadde han fått tilbud om henting dersom han utelandet.

Hendelsen beskrevet av ASL:

Etter fartøysjefens første tur spurte ASL om fartøysjefen ville fly en tur til, noe han bekreftet. Etter at fartøysjefen hadde vært i lufta en stund, ble han forsøkt kalt opp fra bakkestasjon uten svar. ASL prøvde da å nå fartøysjefen på mobiltelefon. En av pilotene på plassen oppdaget så seilflyet i lav høyde i forlengelsen av banen. Flyet traff de høyeste tretoppene, dreide mot venstre, og gikk ned i skogen. ASL sendte folk til skadested, og iverksatte varsling etter klubbens havari-instruks.

Sikkerhet og utdanningsutvalget (SU) kommentar:

Fartøysjefen hadde gyldig sertifikat og gyldig legesjekk. Han hadde nødvendig opplæring og tilstrekkelig erfaring til å gjennomføre turen.

Værforholdene var forenlig med utførelse av turen.

Fartøysjefen leverte en meget grundig og god skriftlig beskrivelse av turen og hendelsesforløpet.

Kryssing av fjellparti betyr generelt flyging over ulandbart område. Ved flyging over ulandbart terreng, mot kjent landbart område, må nødvendig sikkerhetsmargin medregnes.

Når fartøysjefen innser at landing i skog er uunngåelig, gjennomfører han denne på den best tenkelige måte.

ASL har fulgt instruks for ASL og klubbens havariinstruks.

Klubben opererer i ett fjellområde hvor utelanding kan være svært utfordrende. SUU anbefaler at klubben lager en oversikt over landbare områder («utelandingskatalog») i området rundt flyplassen, slik at denne informasjonen blir lettere tilgjengelig for pilotene. Dog ville en slik oversikt alene trolig ikke endret utfallet, da piloten ikke klarte å identifisere jordet ved ankomst til området.

Etter flere havarier har styret i S/NLF og SUU laget en holdningskampanje som starter i årsskiftet 2020/2021. SUU kan ikke lage regler for en hendelse som dette, men må se på hvordan fartøysjefer tenker under flyturen, hvilke avgjørelser man tar, og hvilke marginer man legger til grunn og flyr med. To av plakatene i denne kampanjen er:

- *«Takk for at du flyr med marginer»*
- *«Takk for at du utelandet»*

Fartøysjefen er selv bevisst minst to feilaktige avgjørelser gjennom sin rapport og intervju.

Avgjørelse 1: Er du i tvil, så snu

"My options were then to stop and most probably land in a field in Orkdalen, or keep going to the airfield, which I was not 100 % sure I would reach"

Avgjørelse 2: Land når du har mulighet

“But as I was in the "downwind" for the field, I estimated that it was very short, and that the approach was difficult and I would have to land with a tailwind. This made me afraid to commit to the field knowing that it would probably go wrong somehow

I hesitated a few seconds, until it was too late. The field was now behind, I thought that the airfield was the only option left”

Flyr ikke med nødvendige sikkerhetsmarginer

Fartøysjefen vektlegger under intervjuet selv at hans erfaringsnivå trolig er en medvirkende årsak til at han ikke hadde nødvendig sikkerhetsmargin. Dette har i så måte vært en vekker for fartøysjefen.