



NORSK LUFTAMBULANSE
NORWEGIAN AIR AMBULANCE

Helicopter procedures

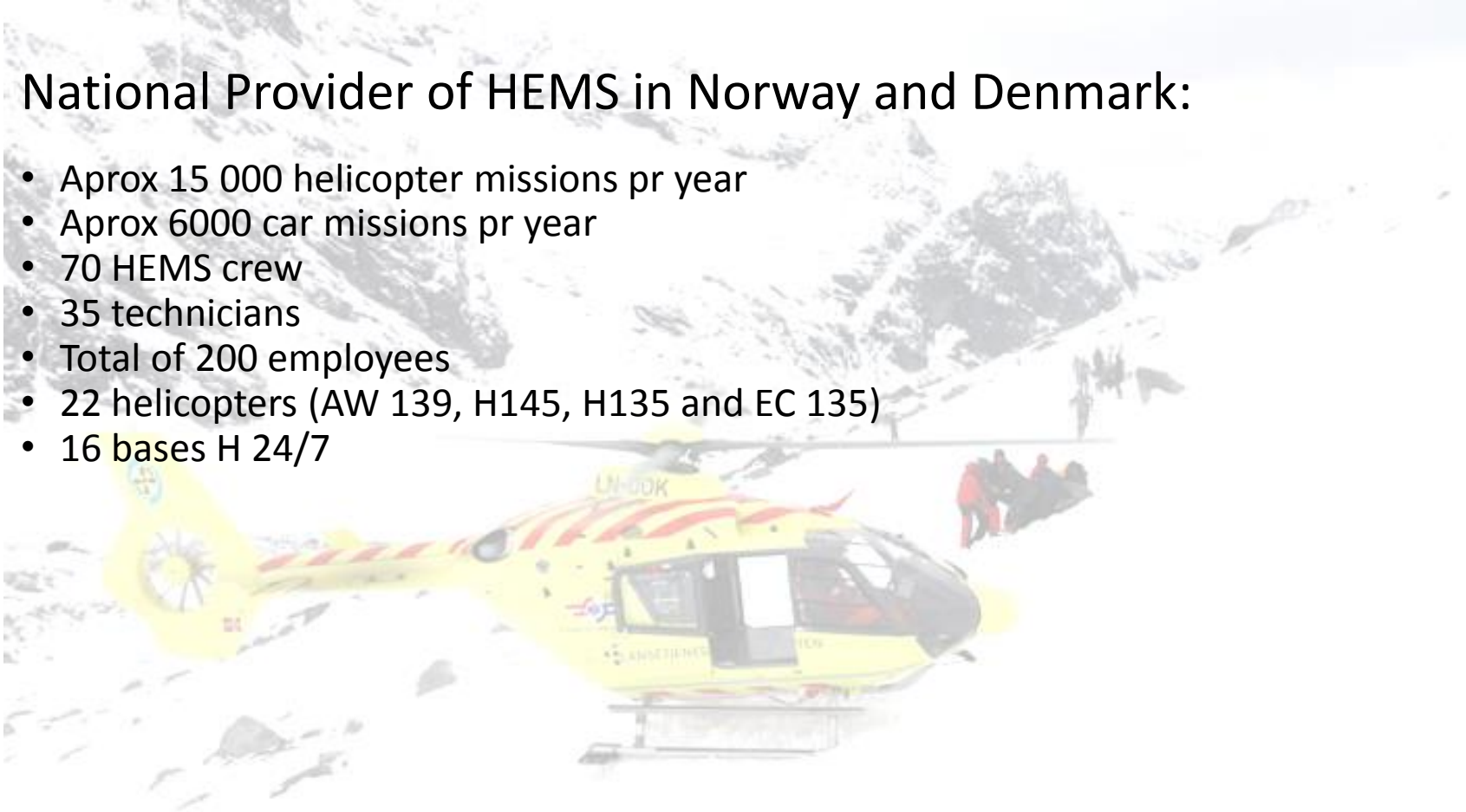
Use of EGNOS for PinS and low level routes

Lars Erik Bragstad/Lars Amdal

Norsk Luftambulanse AS | NOLAS

National Provider of HEMS in Norway and Denmark:

- Aprox 15 000 helicopter missions pr year
- Aprox 6000 car missions pr year
- 70 HEMS crew
- 35 technicians
- Total of 200 employees
- 22 helicopters (AW 139, H145, H135 and EC 135)
- 16 bases H 24/7





Lyngen



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NORWEGIAN AIR AMBULANCE



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The customer





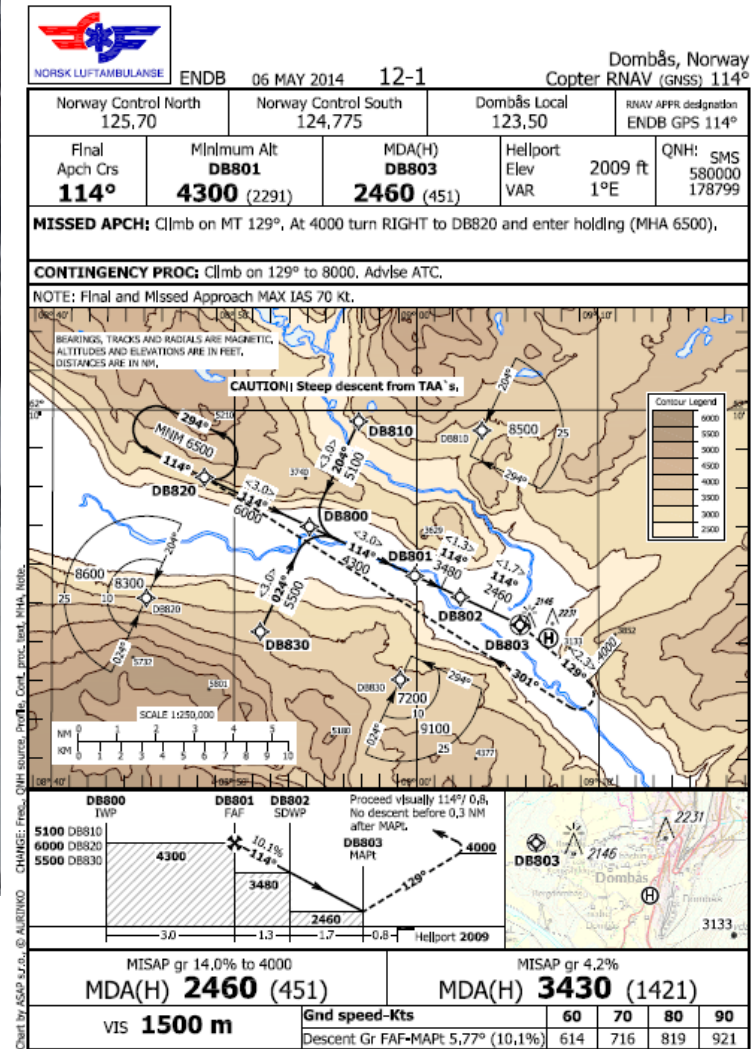
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NORWEGIAN AIR AMBULANCE

We don't do runways

...or flightlevels



We do this!



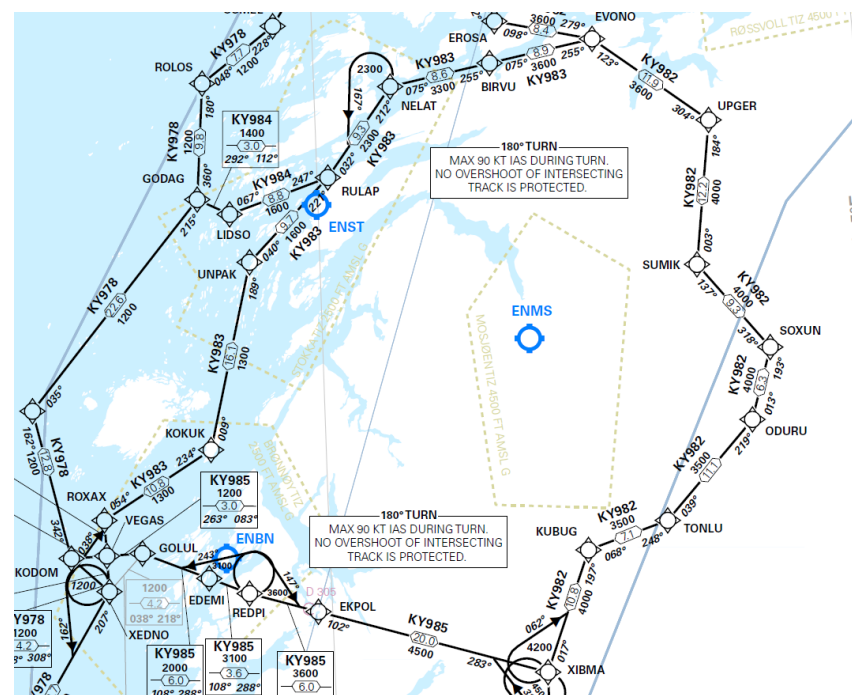
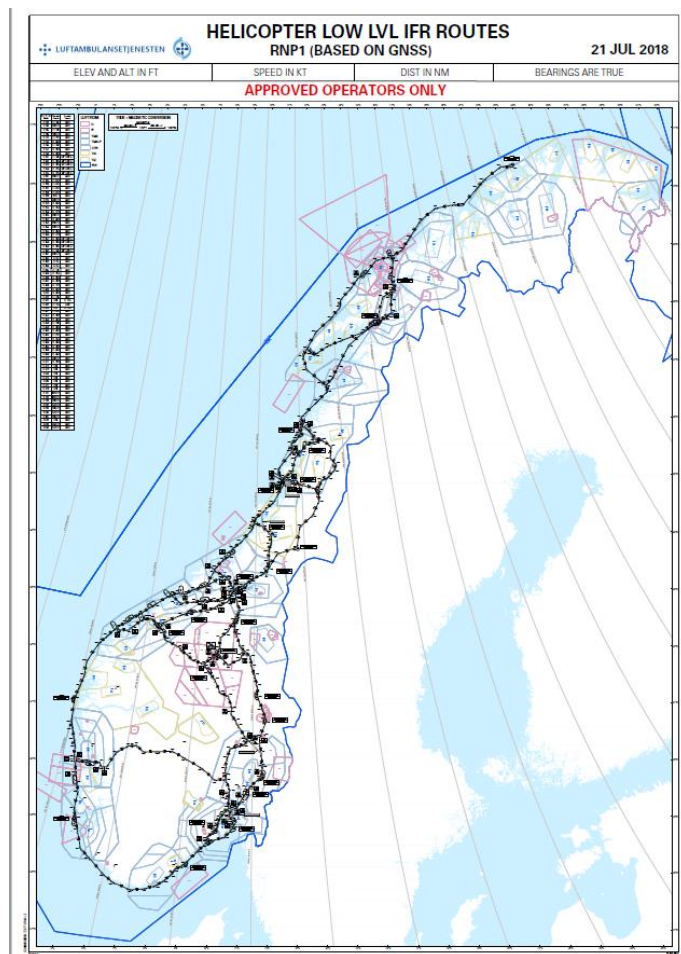
State of the art equipment



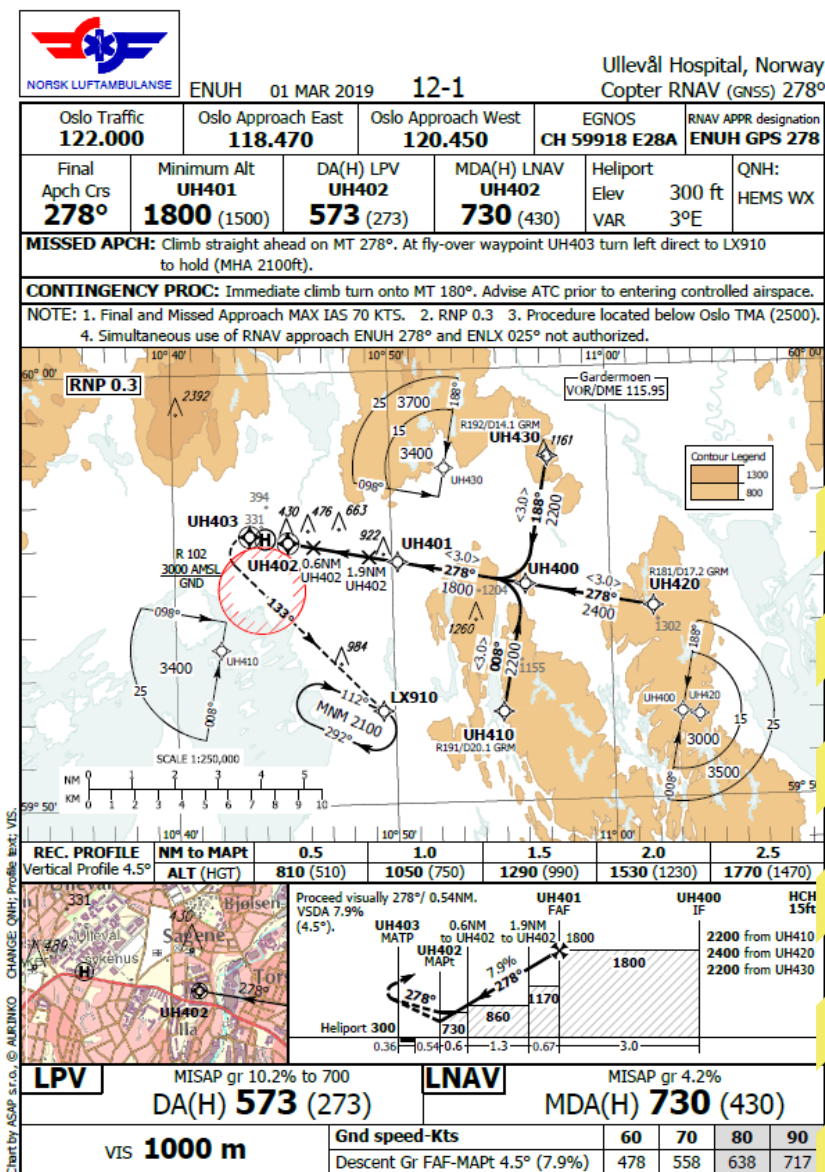
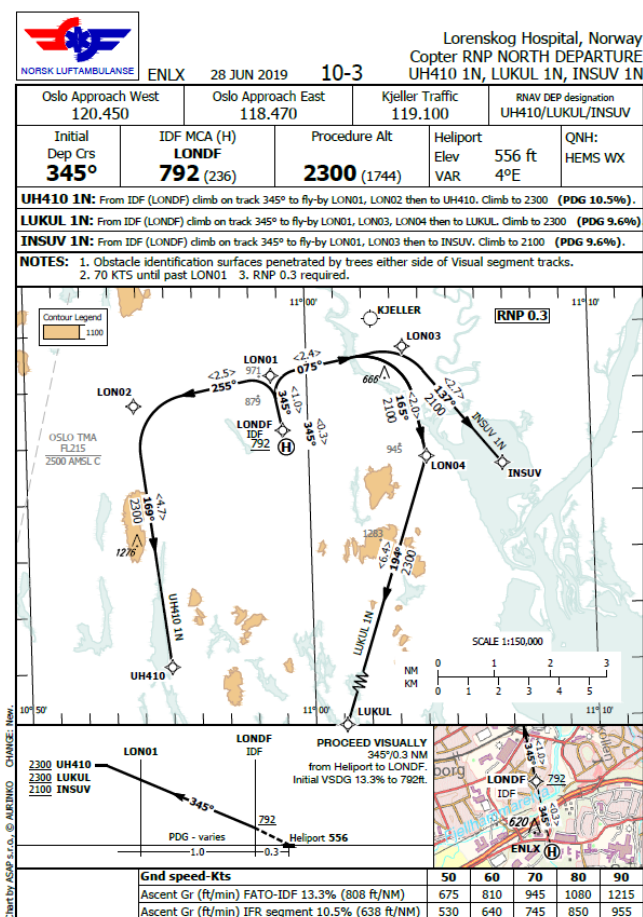
Low level IFR from the cockpit H145



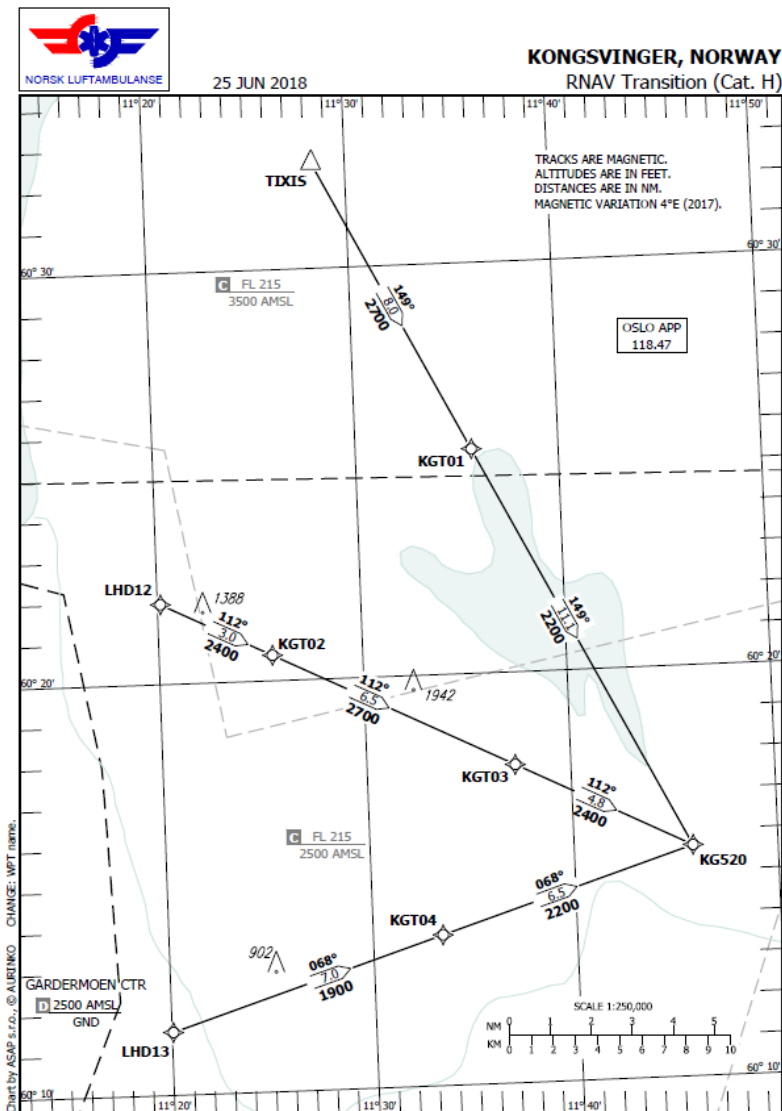
Enroute low level IFR network



GNSS procedures



Transitions to approach from LFN



Bergen ENBG



19.1°C

17:22

01m13s



28.06.2017

17:15

07m50s



-15 min

+15 min

Latest



Overlay



Ideal

Temperaturutvikling

20°C

19.5°C

19°C



Status September 2019

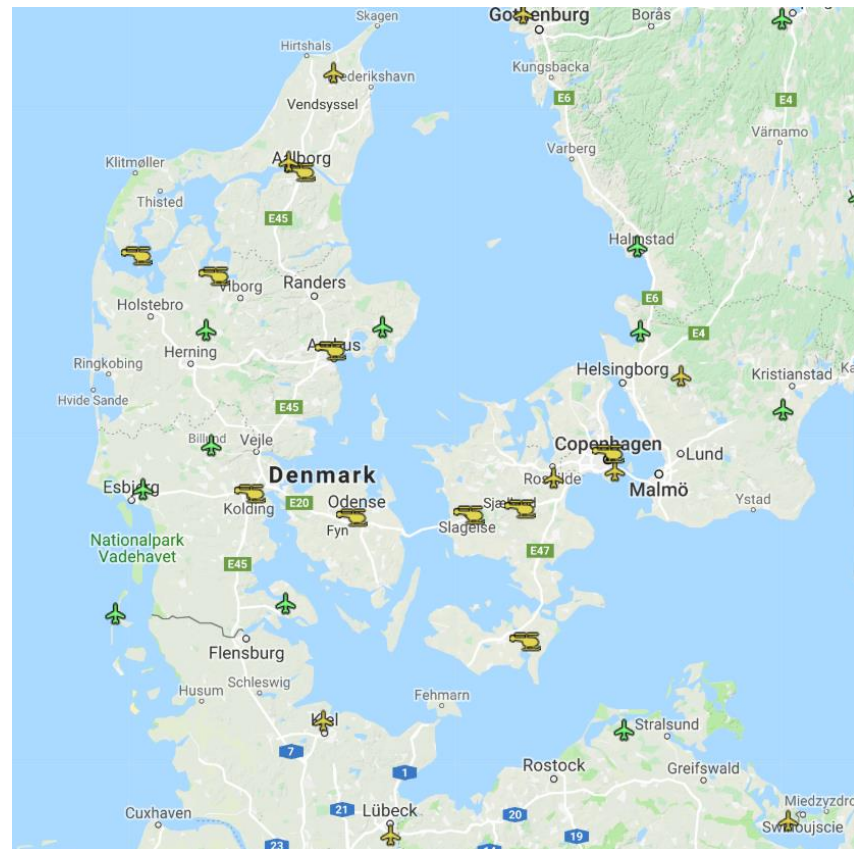
- **Norway**

- 55 RNP approaches
 - 18 LPV
- 12 LPV in design
- 16 PINS dep procedures
- Low level IFR network
- RNP 0,3 transitions

- **Denmark**

- 10 PINS LPV
- 2 LPV in design
- 8 PINS RNP departures
- Low level IFR network in design

ESSP LPV SBAS procedures

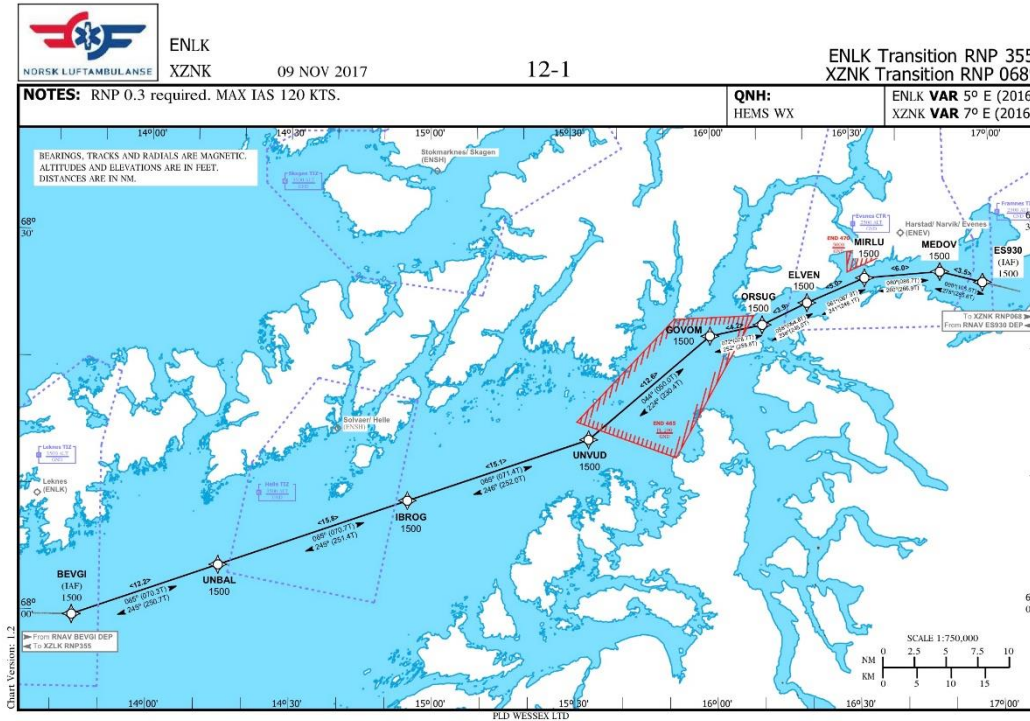
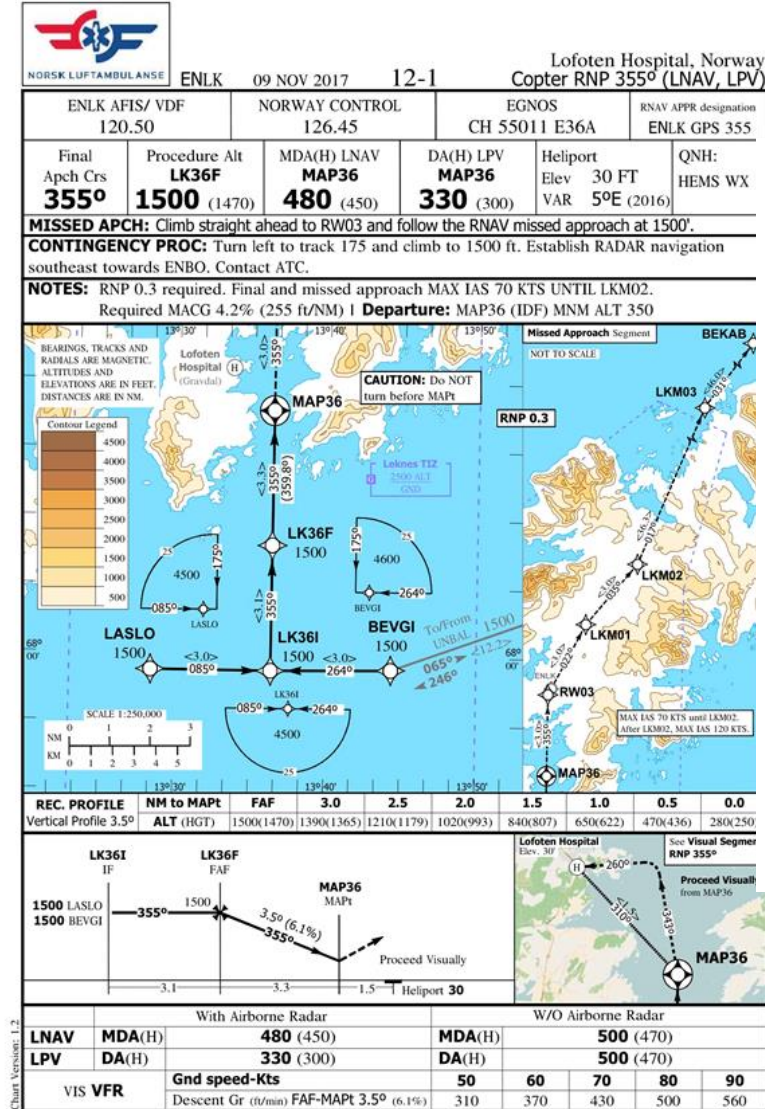




0°C



SBAS procedures

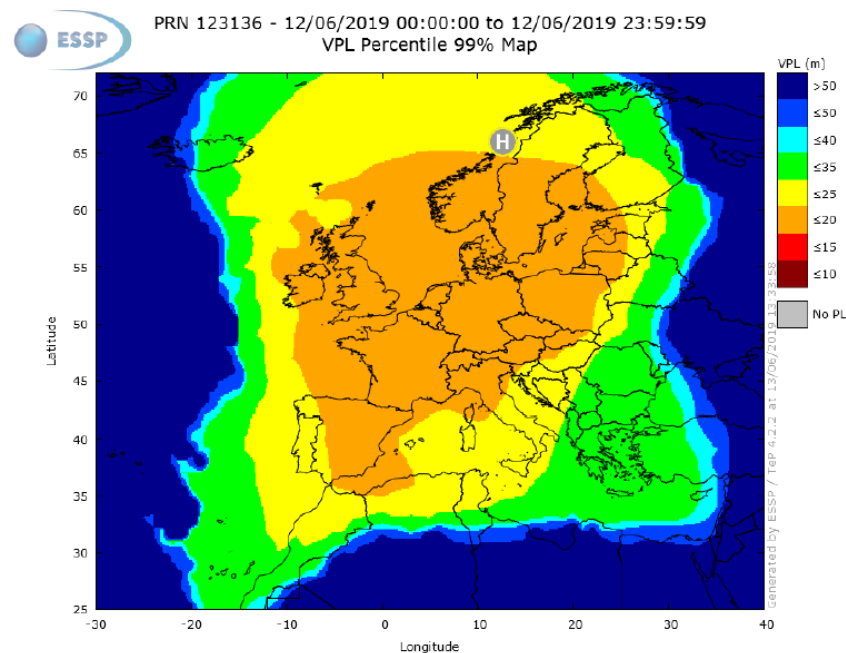
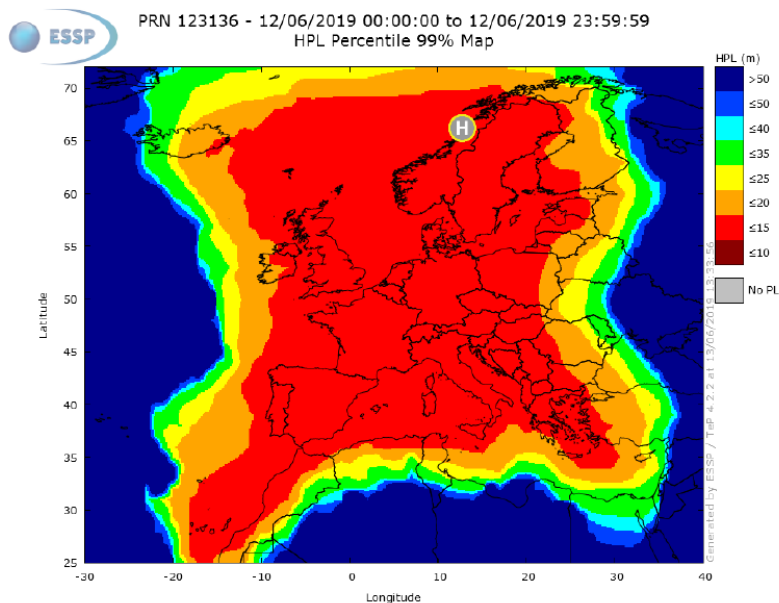


EGNOS APV-1 availability?



HPL/VPL daily map

B.1.2 HPL/VPL Daily Map





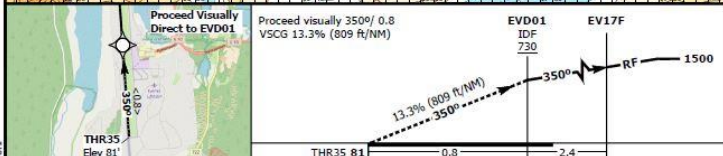
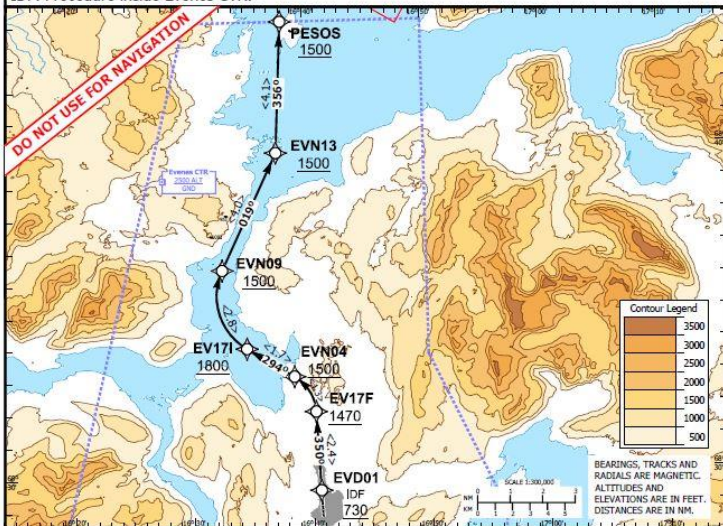
ENEV **XX XX XXXX** **XX-X** Copter RNAV PESOS DEPARTURE

ATIS 126.025	APP 120.100	TWR 120.100(118.000)	VDF 120.100	RNAV DEP designation PESOS
Initial Dep Crs 350°	IDF MCA(H) EVD01 730 (649)	Procedure Alt 1500 (1419)	THR35 Elev 81 FT VAR 90E (2017) Annual Change 14° E	QNH: ENEV ATIS

DESCRIPTION: From THR35, climb to EVD01 at or above 730'. Then to EV17F and follow the RNAV departure climbing up to 1500'.

CONTINGENCY PROC: TBD

NOTES: RNP 0.3 and RF required. Set CDI to 0.3 NM. MAX IAS 100 KT. Obtain minimum Vy before IDF. Procedure inside Evenes CTR.



VIS 800 m	Gnd speed-Kts	50	60	70	80	90
	Ascent Gr (ft/min) FATO-IDF 13.3% (809 ft/NM)	680	810	950	1080	1220
	Ascent Gr (ft/min) IFR segment 5% (304 ft/NM)	260	310	360	410	460

PLD WESSEX LTD



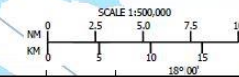
XZEV
XZTC **XX XX XXXX** **XX-X**

XZEV Transition RNP RWY17
XZTC Transition ILS RWY01
XZTC Transition RNP Z/Y 359°

NOTES: RNP 0.3 and RF required. MAX IAS 120 KTS. QNH: HEMS WX ENEV VAR 7° E (2017) ENTIC VAR 9° E (2017)



Chart Version: 1.0

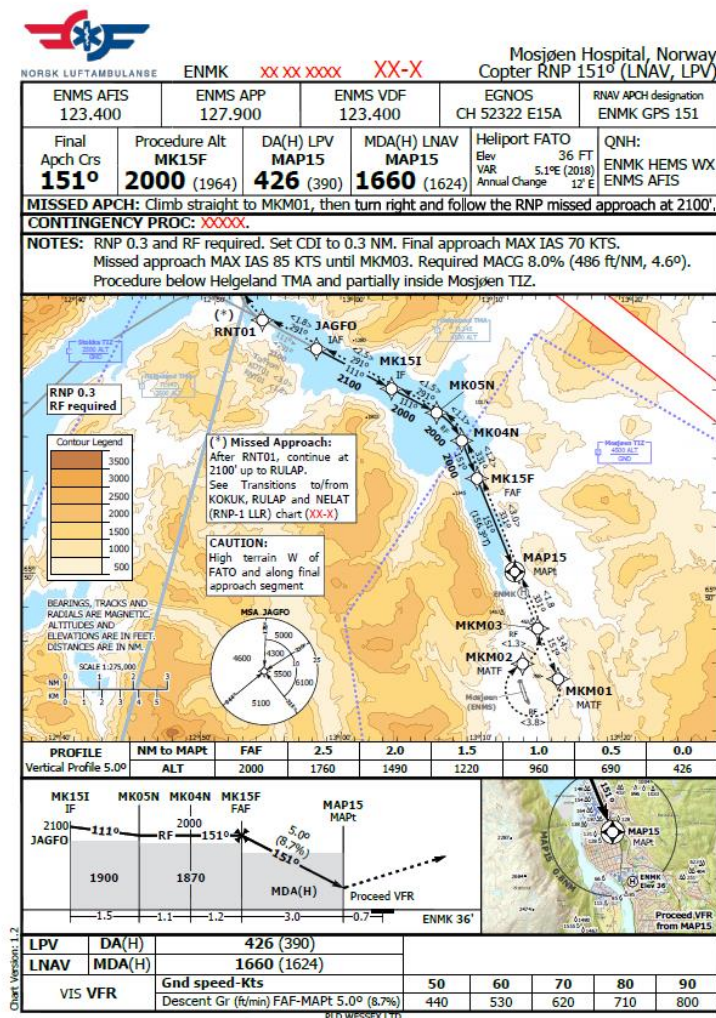
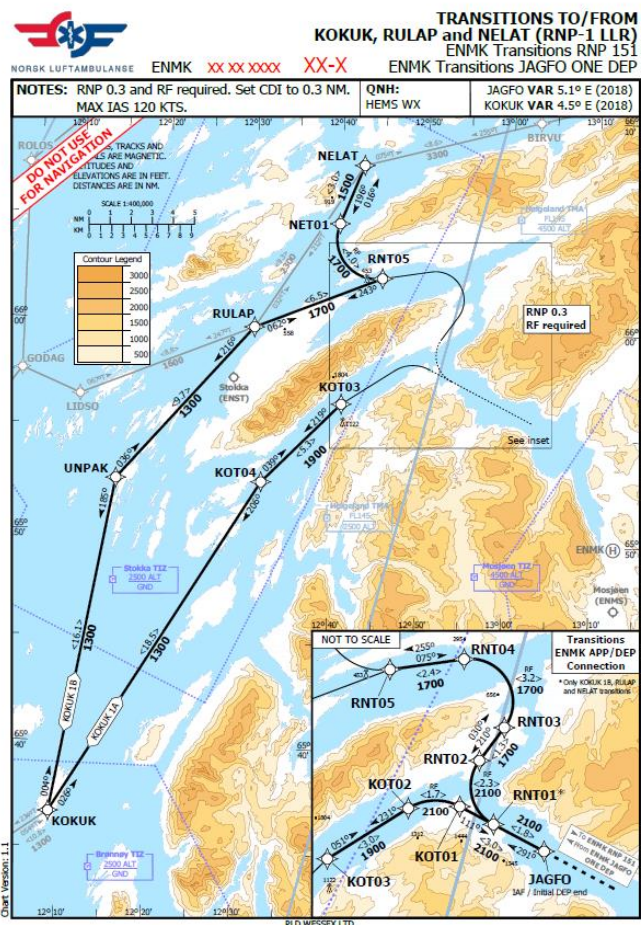


PLD WESSEX LTD



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Advanced SBAS procedures





NORSK LUFTAMBULANSE

XZTC/UNN **XX XX XXXX XX-X**

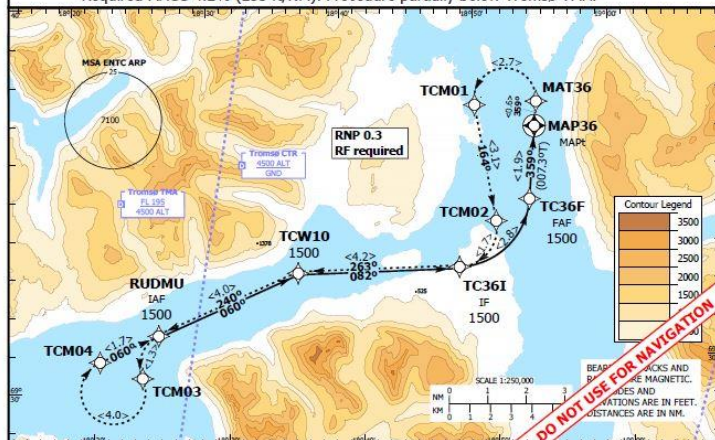
Tromsø Hospital, Norway
Copter RNP Z 359° (LNAV, LPV)

ENTC ATIS 126.125	ENTC APP 123.750	ENTC TWR 118.300(122.100)	ENTC VDF 123.750	EGNOS CH 62366 E36A	RNAV APCH designation XZTC GPS Z 359
Final Apch Crs 359°	Procedure Alt TC36F 1500 (1369)	DA(H) LPV MAP36 381 (250)	MDA(H) LNAV MAP36 440 (309)	Heliport FATO Elev 131 FT VAR 9°E (2017) Annual Change 14' E	QNH: HEMS WX ENTC ATIS

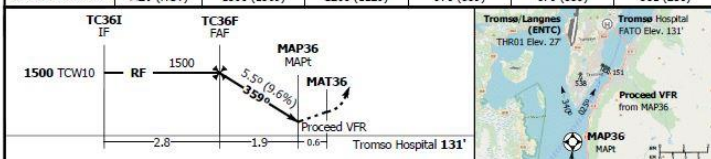
MISSED APCH: Climb straight ahead to MAT36 and follow the RNP missed approach at 1500'.

CONTINGENCY PROC: TBD

NOTES: RNP 0.3 and RF required. Final and missed approach MAX IAS 80 KTS.
Required MACG 4.2% (255 ft/NM). Procedure partially below Tromsø TMA.



PROFILE	NM to MAPt	FAF	1.5	1.0	0.5	0.0
Vertical Profile 5.5°	ALT (HGT)	1500 (1369)	1260 (1129)	970 (839)	670 (539)	381 (250)



	With Airborne Radar			W/O Airborne Radar				
LPV	DA(H)	381 (250)	DA(H)	500 (369)				
LNAV	MDA(H)	440 (309)	MDA(H)	500 (369)				
VIS VFR	Gnd speed-Kts			50	60	70	80	90
	Descent Gr (ft/min)	FAF-MAPt 5.5° (9.6%)	490	580	680	780	880	

PLD WESSEX LTD



NORSK LUFTAMBULANSE

XZTC **XX XX XXXX XX-X**

Tromsø/ Langnes, Norway
Copter ILS RWY01

ENTC ATIS 126.125	ENTC APP 123.750	ENTC TWR 118.300(122.100)	ENTC VDF 123.750	APCH designation XZTC ILS RWY01
ENTC LOC TC 110.900	Final Apch Crs 004°	Procedure Alt TC01F 1500 (1473)	ILS DA(H) Refer to chart AD 2 ENTC 5-1	Airport THR01 Elev 27 FT VAR 9°E (2017) Annual Change 14' E

MISSED APCH: See ENTC ILS RWY01

CONTINGENCY PROC: TBD

NOTES: RNP 0.3 and RF required. MAX IAS 120 KTS.
Initial Approach, for Final APCH see AD 2 ENTC 5-1. Procedure partially below Tromsø TMA.

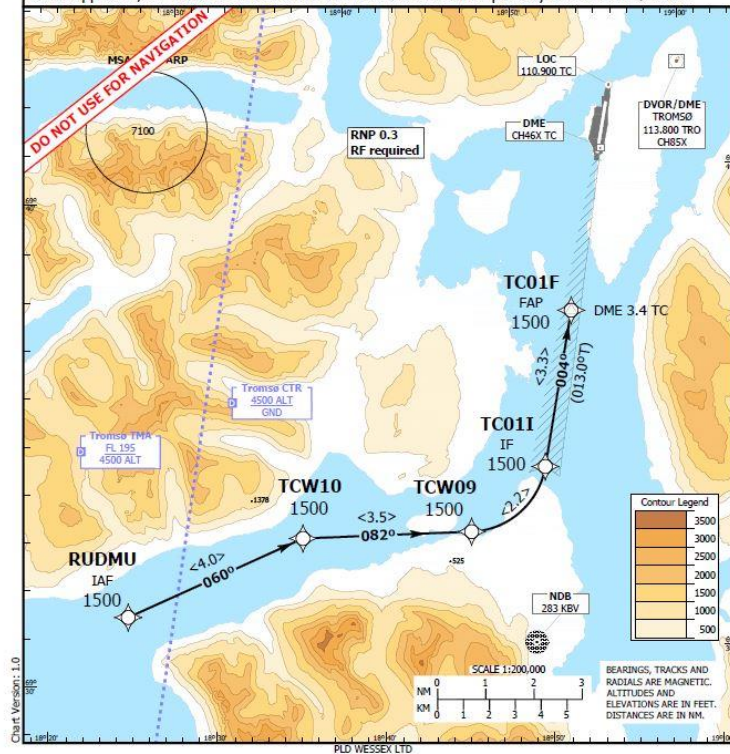
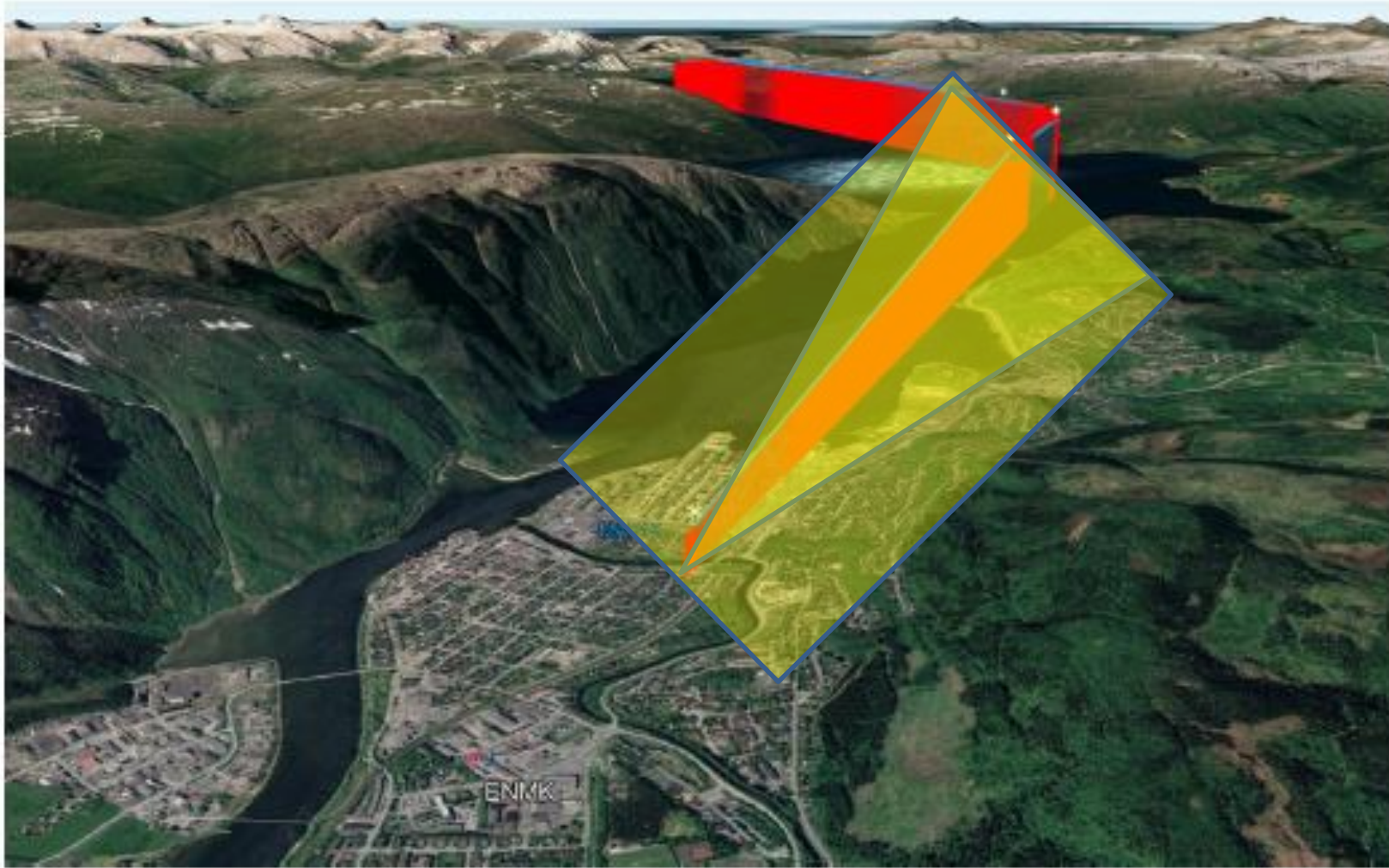


Chart Version: 1.0



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SBAS final approach

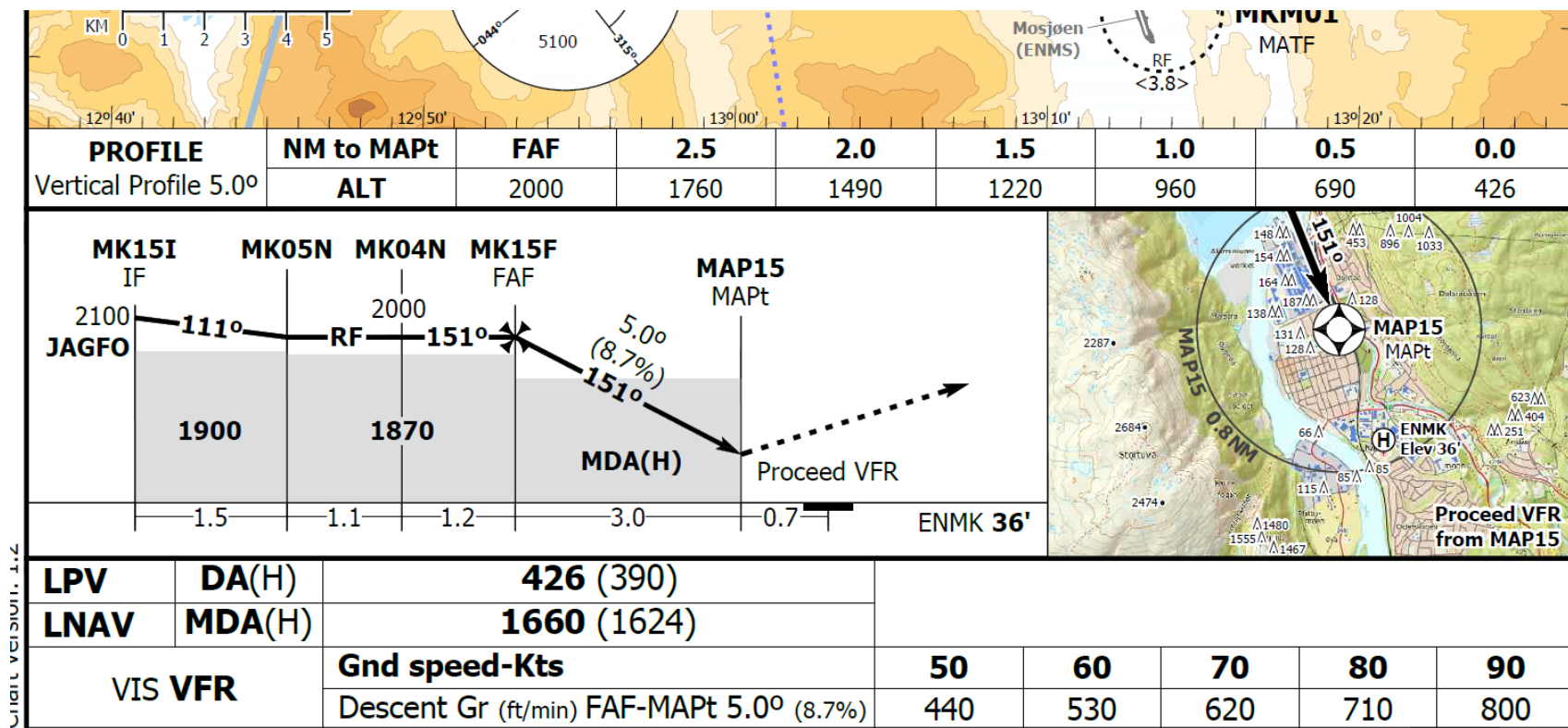


Vertical guidance



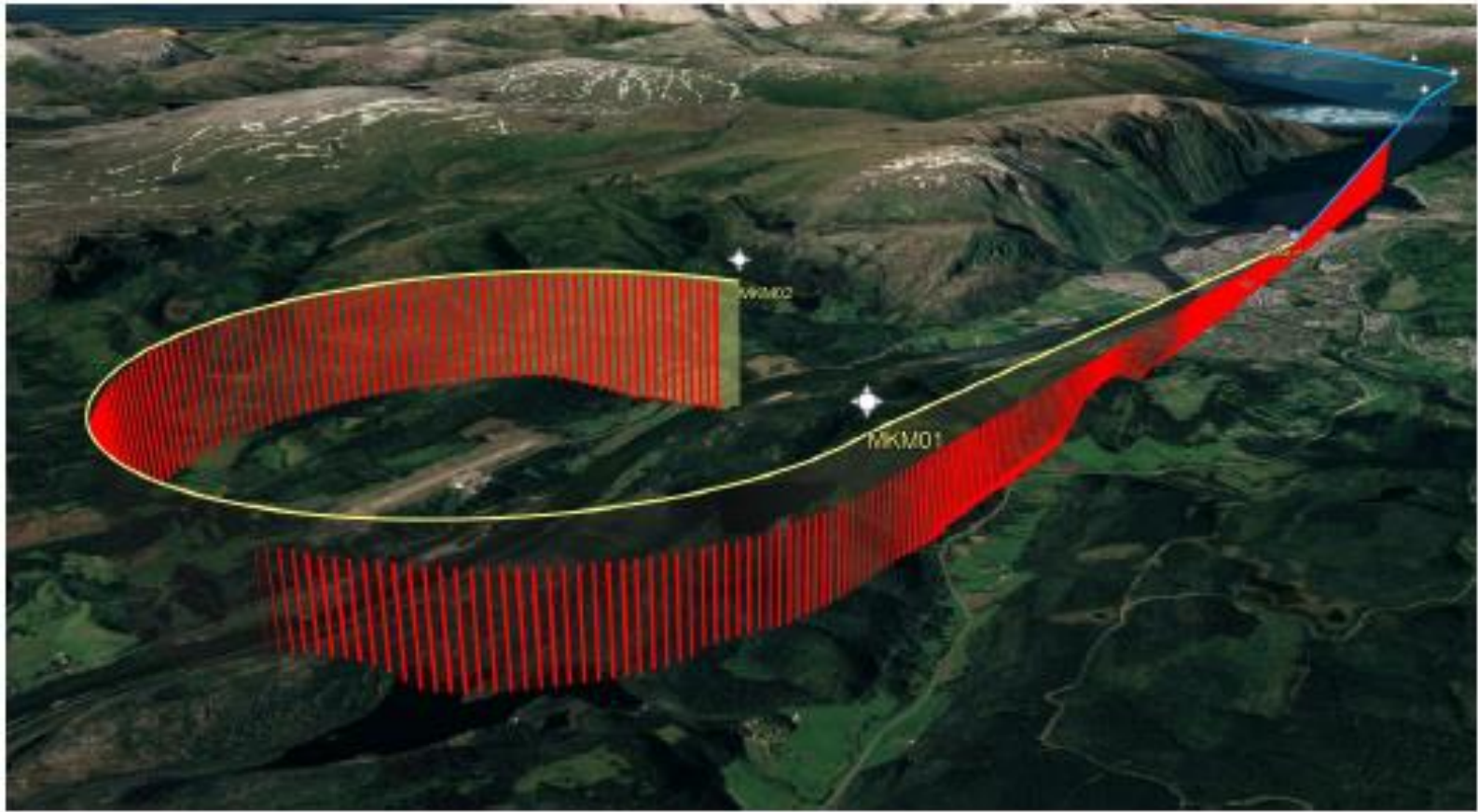
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LPV versus LNAV minima



PLD WESSEX LTD

Radius to fix missed approach



EGNOS NOTAMS

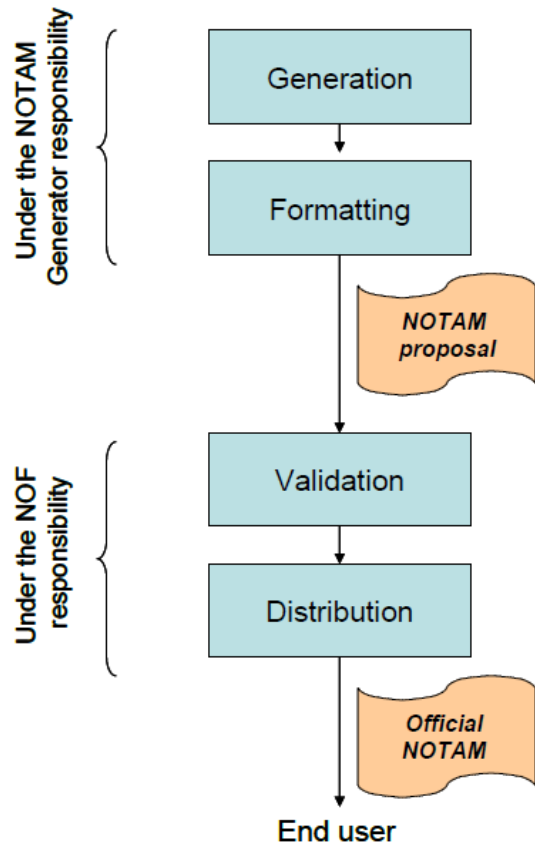


Figure 2-1 The NOTAM process

- ESSP generates
 - And formats in to the EAD database
- The national NOTAm office approves
- AVINNOR ditributes
- The operator gets access to the NOTAM

The NOTAM chain

