



# Does PBN save lives?

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# Helicopter IFR...



# One result of our efforts to reduce risk in VFR operations

- All aircraft and crews are IFR certified

Why not use this capability to increase safety and mission regularity?



# Challenges

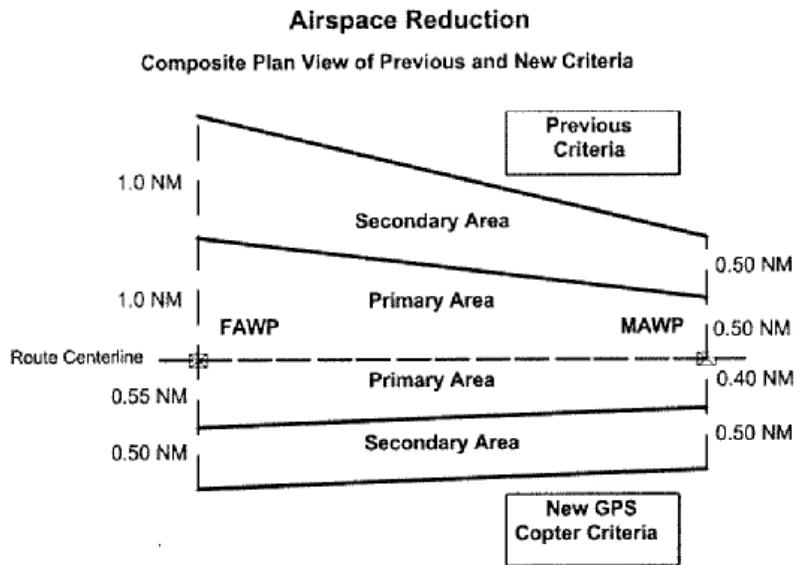


- Lack of infrastructure
- Low freezing levels and high MEAs
- Operational regulations are inadequate.
- Reluctance within the industry?

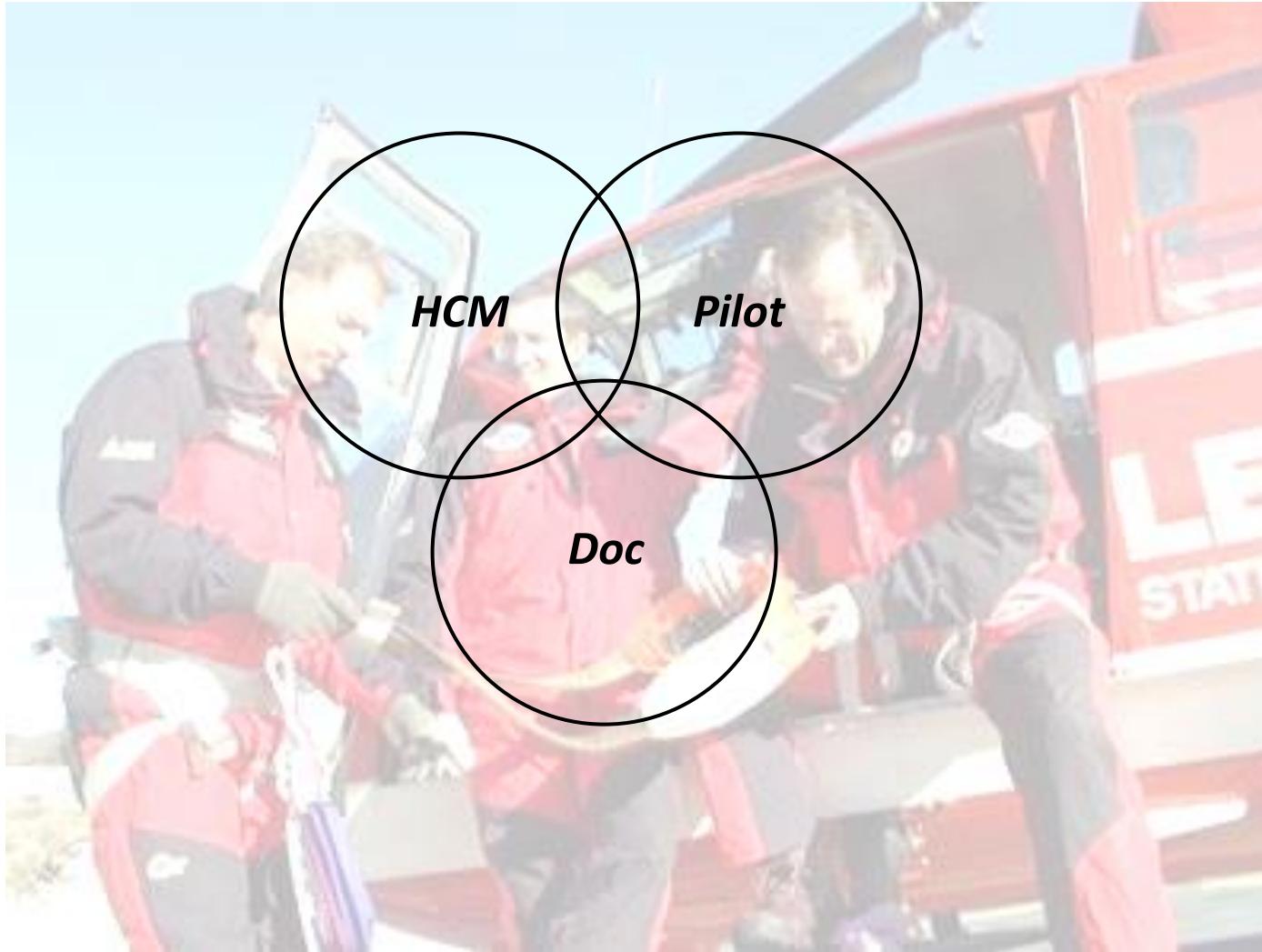
# A long journey....

# ICAO PANS-OPS PinS criteria

- Published November -04
- Utilizes the helicopter's low speed and good maneuverability .
- 70 knots
- High decent and climb rates.
- Steep turns
- Smaller protected area



# Integrated Crew Concept







NORWEGIAN AIR AMBULANCE

LN-00M



LN-00M

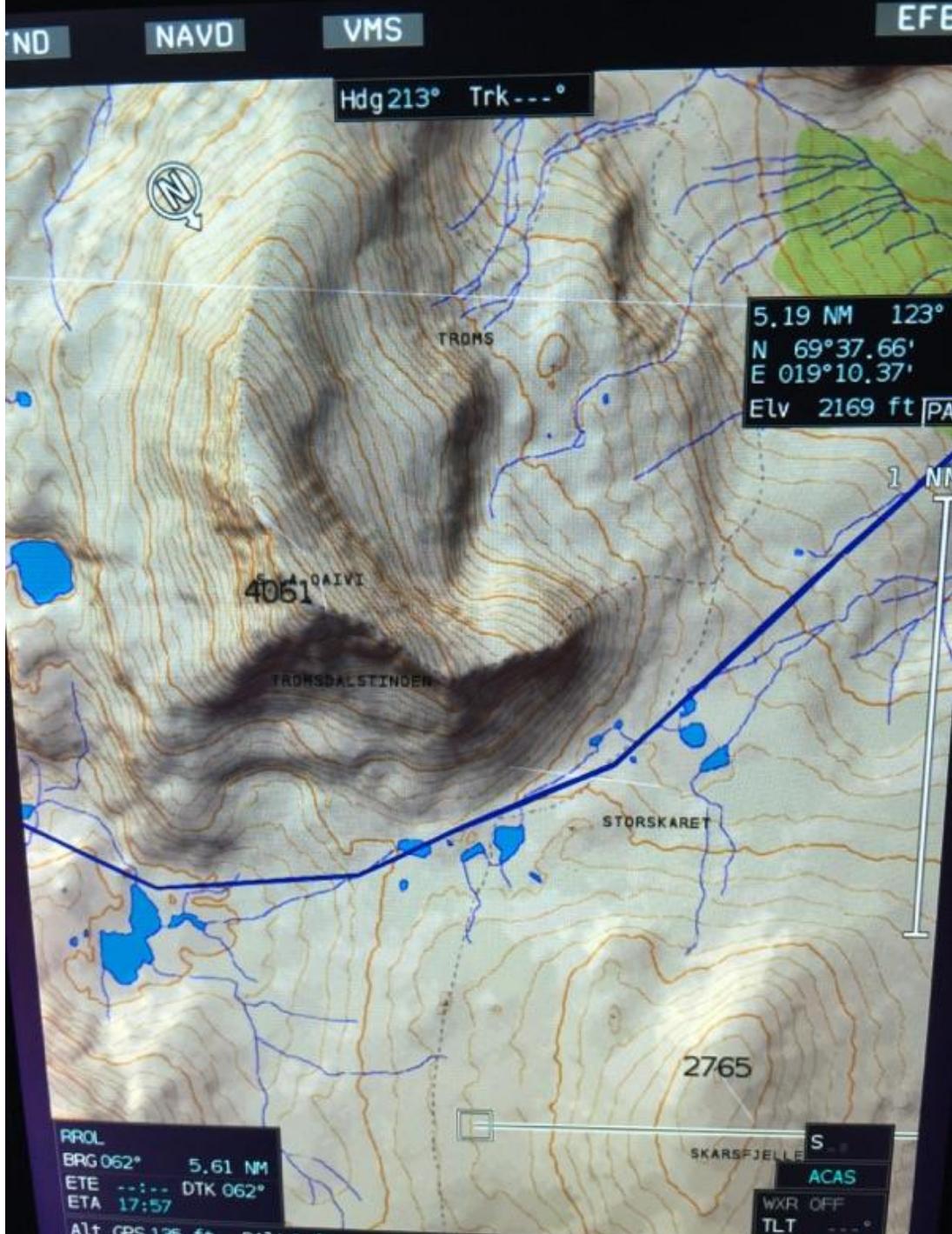
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EFE

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NORSK LUFTAMBULANSE  
NORWEGIAN AIR AMBULANCE













NORSK LUFTAMBULANSE  
NORWEGIAN AIR AMBULANCE



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HEMS IFR

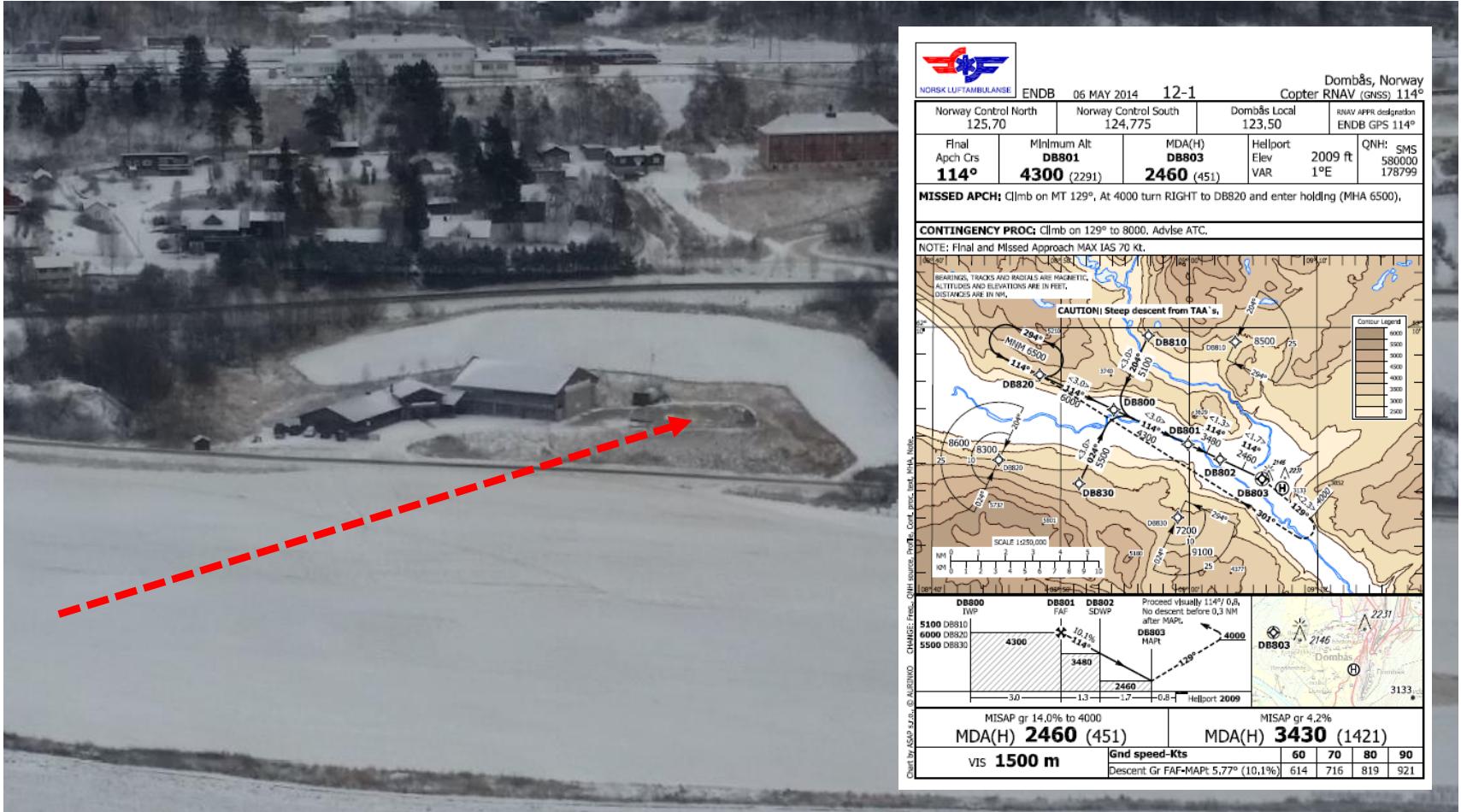
# WHY?



# We don't do runways



# We do this!

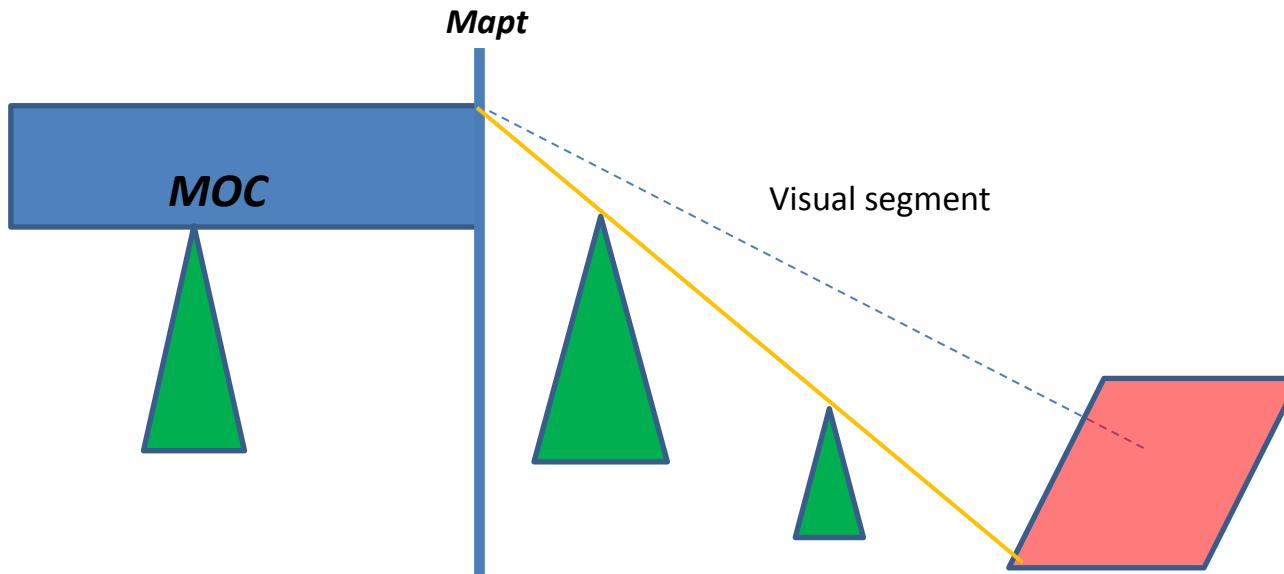


???





# Design konsept – PINS approach to LNAV/LP



A PinS approach is an Instrument Approach to a MAPt that is not directly associated with an airport or a helipad. As helicopters are much more flexible in terms of flight operation, a PinS approach is a procedure that makes advantage of that flexibility. The approach is flown to a Point in Space, from where the helicopter will "proceed visually" or, executes a missed approach.

# Design requirements

- NAV SPECS: RNP 0.3 for all segments except final (RNP APCH with LNAV and LPV minima)
- Speeds: Limited to 70 KIAS if necessary.
- GPA of 3,5 deg for all approaches as baseline. Steep GPA can be proposed if operational advantage is derived. Fly trough penalty for LPV
- MACG of 4,2%. In case increased MACG are required, values up to 14% can be proposed.
- Standard MOC to be applied
- Proceed Visually with Direct VS
- The VS length should be the shortest possible, and the OCA/H the lowest possible



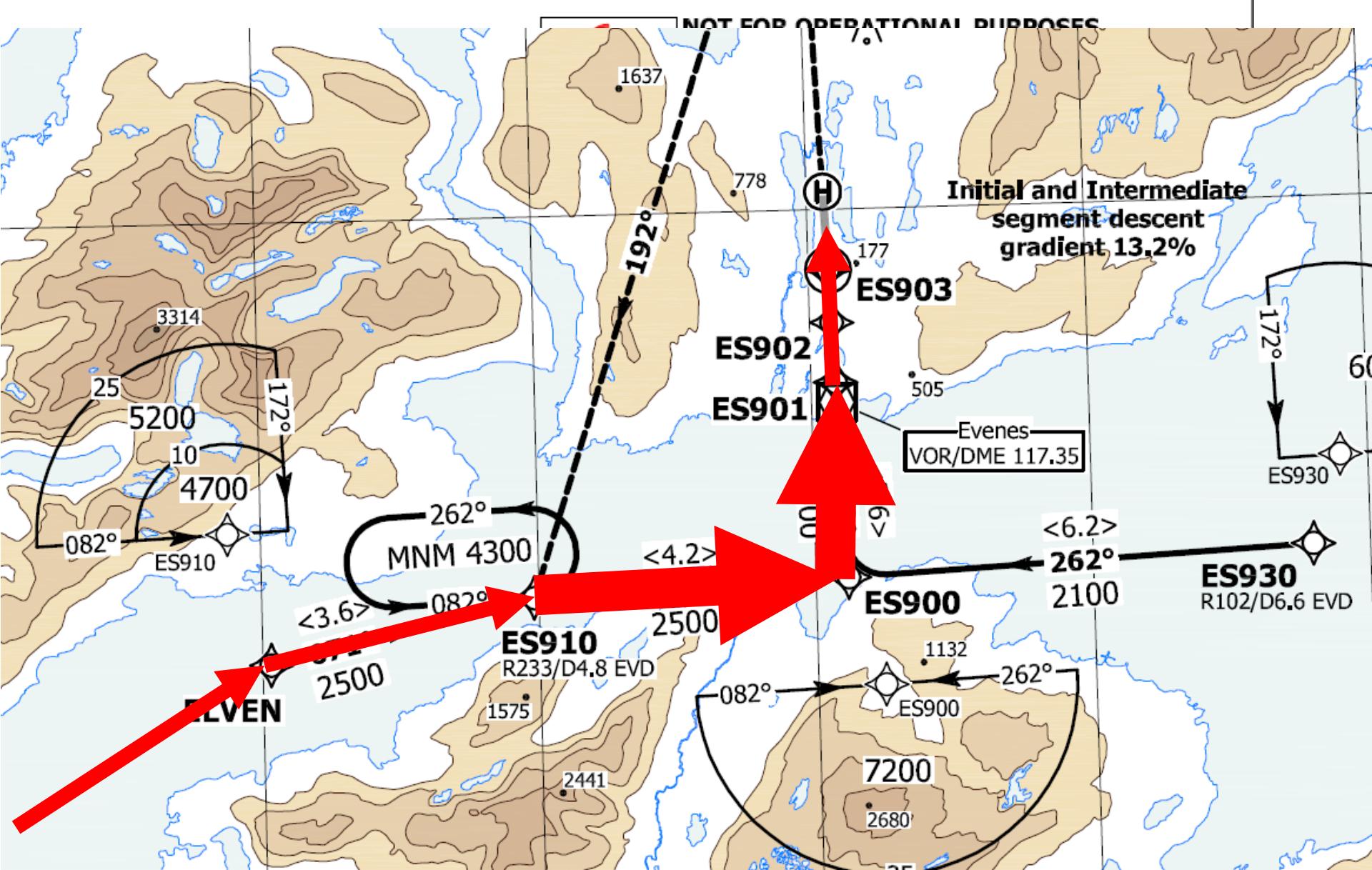
# IFR procedures - considerations

- Class G – information to users
- Avtaler med ATC enhet iht til krav fra Luftfartstilsynet
- Frequency allocation
- Comm procedures. Internt og eksternt
- Trafic advisory and conflict resolution
- Priority issues

## Design: Evenes

### Evenes scenario

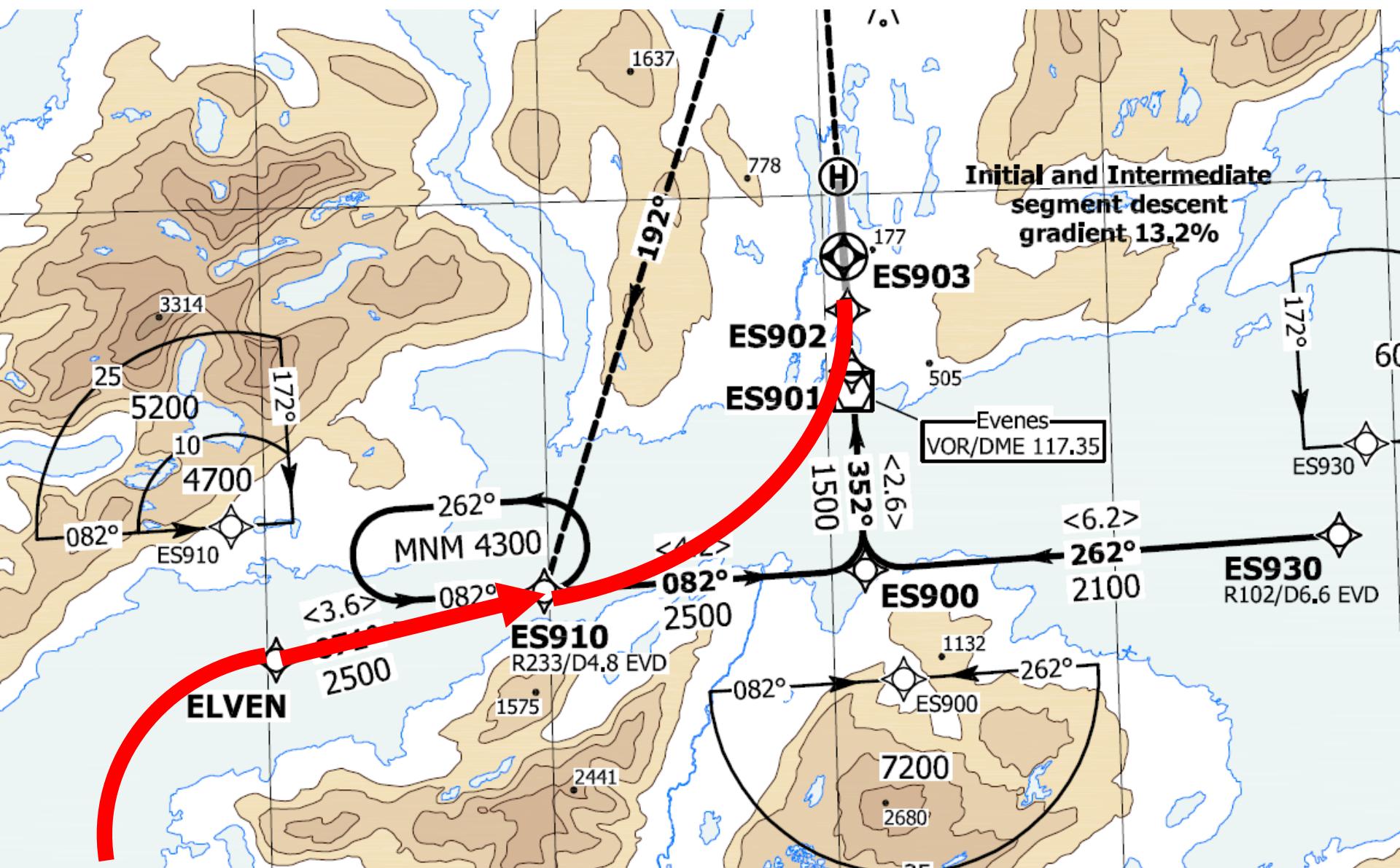




MISAP gr 14.0% to 740 MDA(H) <b>490</b> (408)	MISAP gr 4.2% MDA(H) <b>670</b> (588)
VIS <b>1929 m</b>	Gnd speed-Kts
	60 70 80 90
Descent Gr FAF-MAPt 6.4° (11.2%)	682 795 909 1022

# ES910 at 1500ft MSL





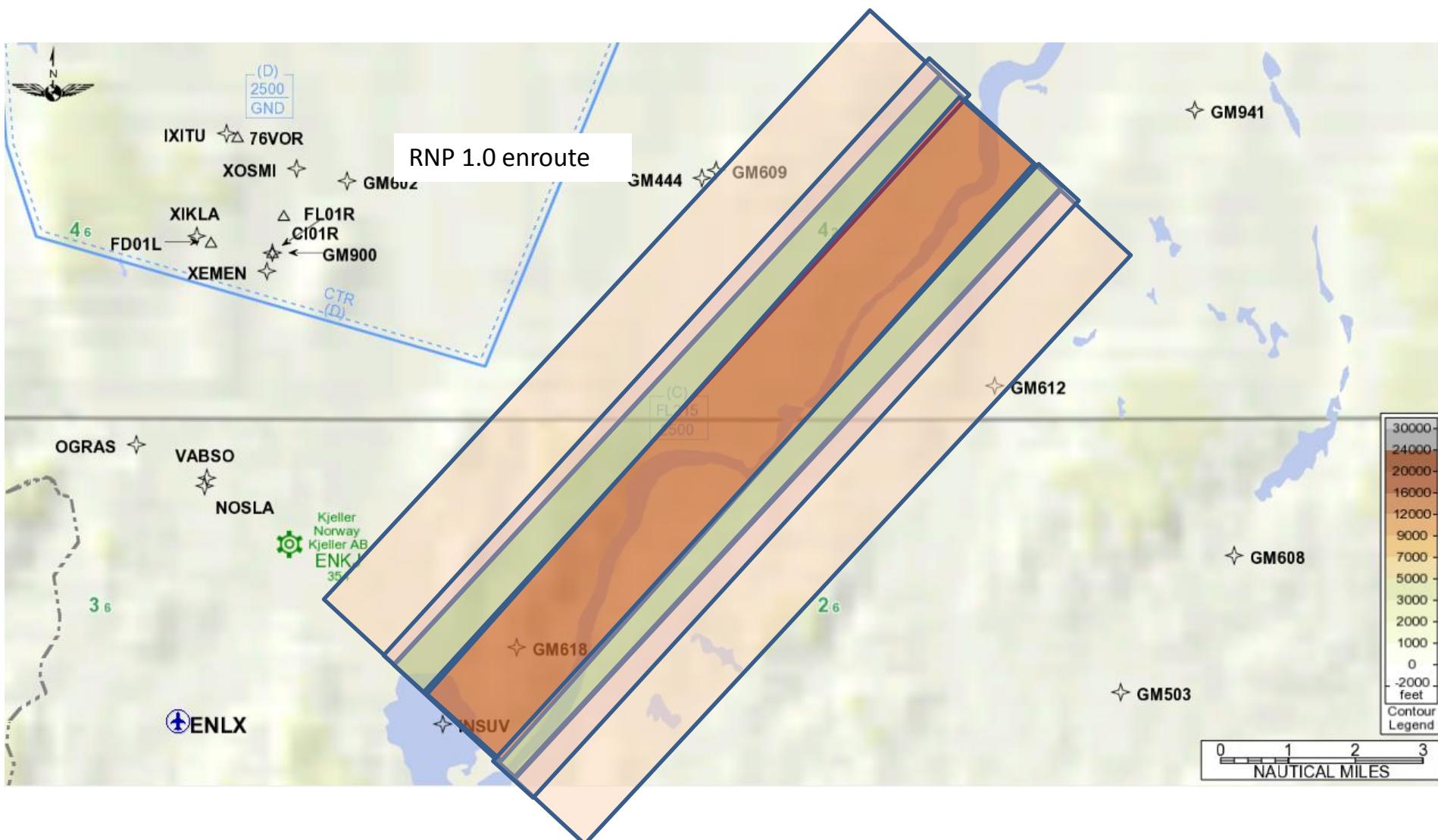


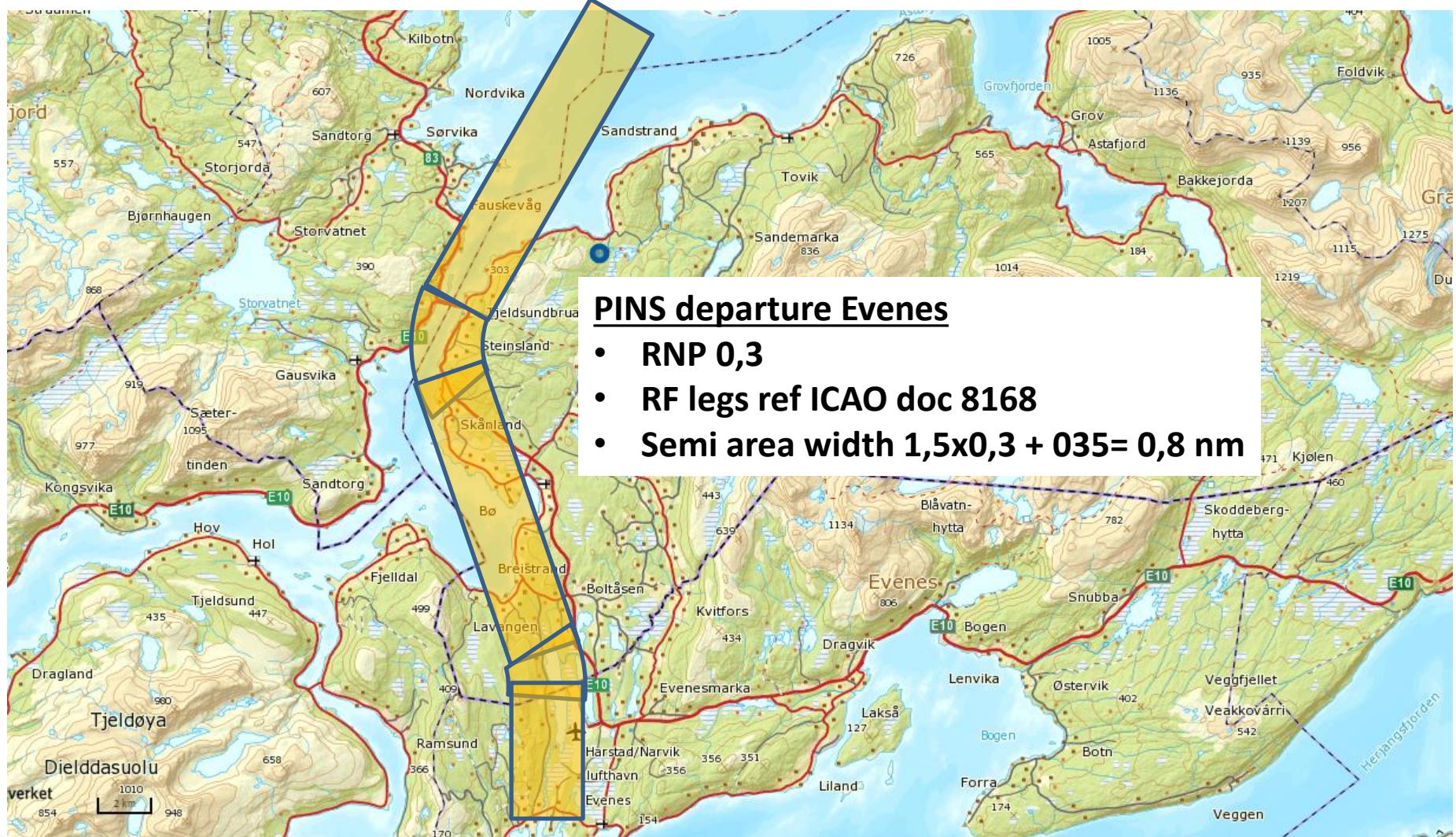


# Veien hit og litt videre....

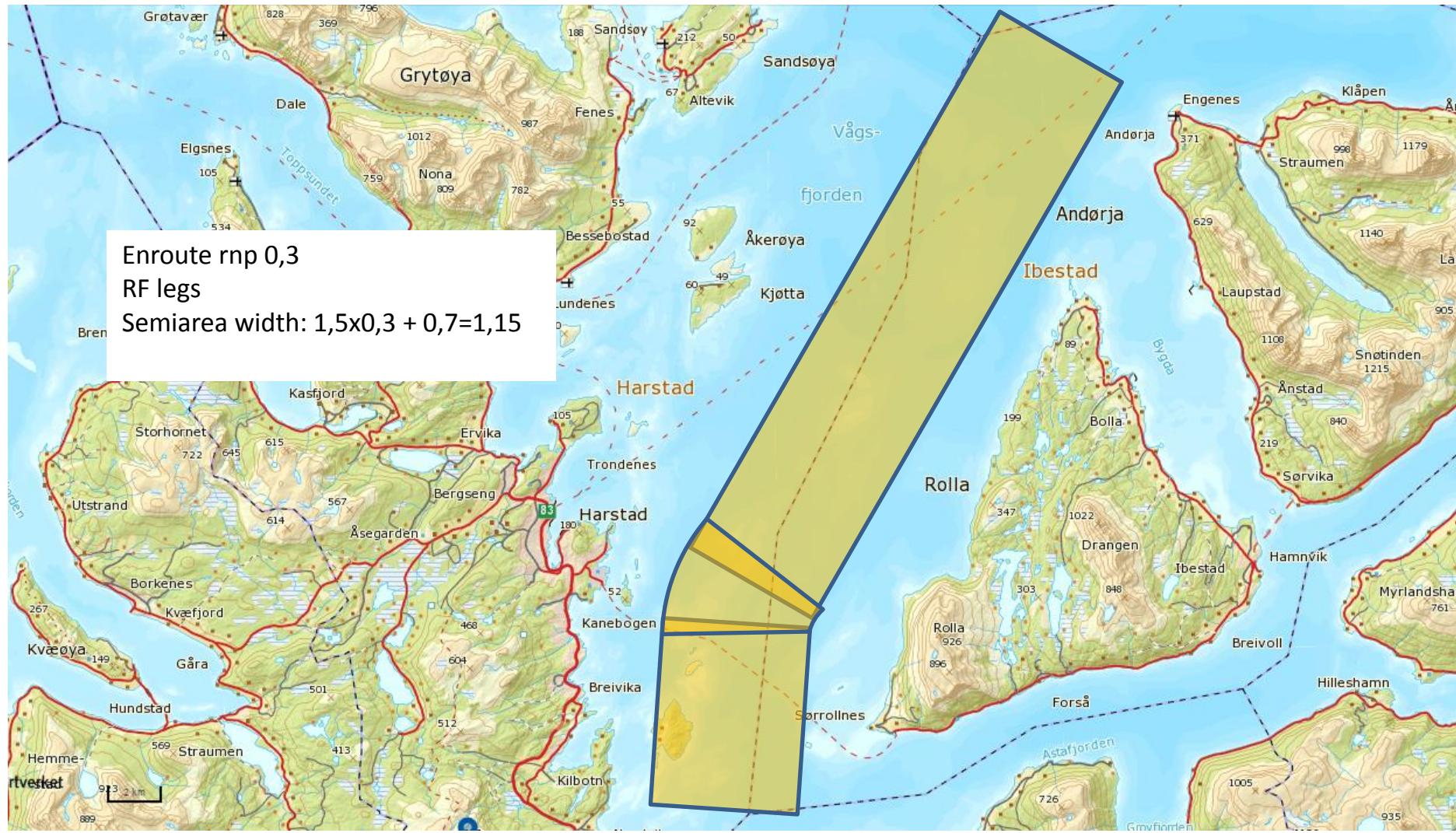
- Enkeltstående approacher
- Enroute on own calculation - +1000/10 NM
- Crew trening
- Utvidels av operasjonen -
  - LNAV - RNP 0,3 in all phases - LPV - RF-legs - RNP AR
- Forbinde innflygingene med enroute segmenter
- Departure prosedyrer – RNP 0,3
- ATC koordinering ADSB
- Publisering av prosedyrer.

**RNP 0,3 enroute**

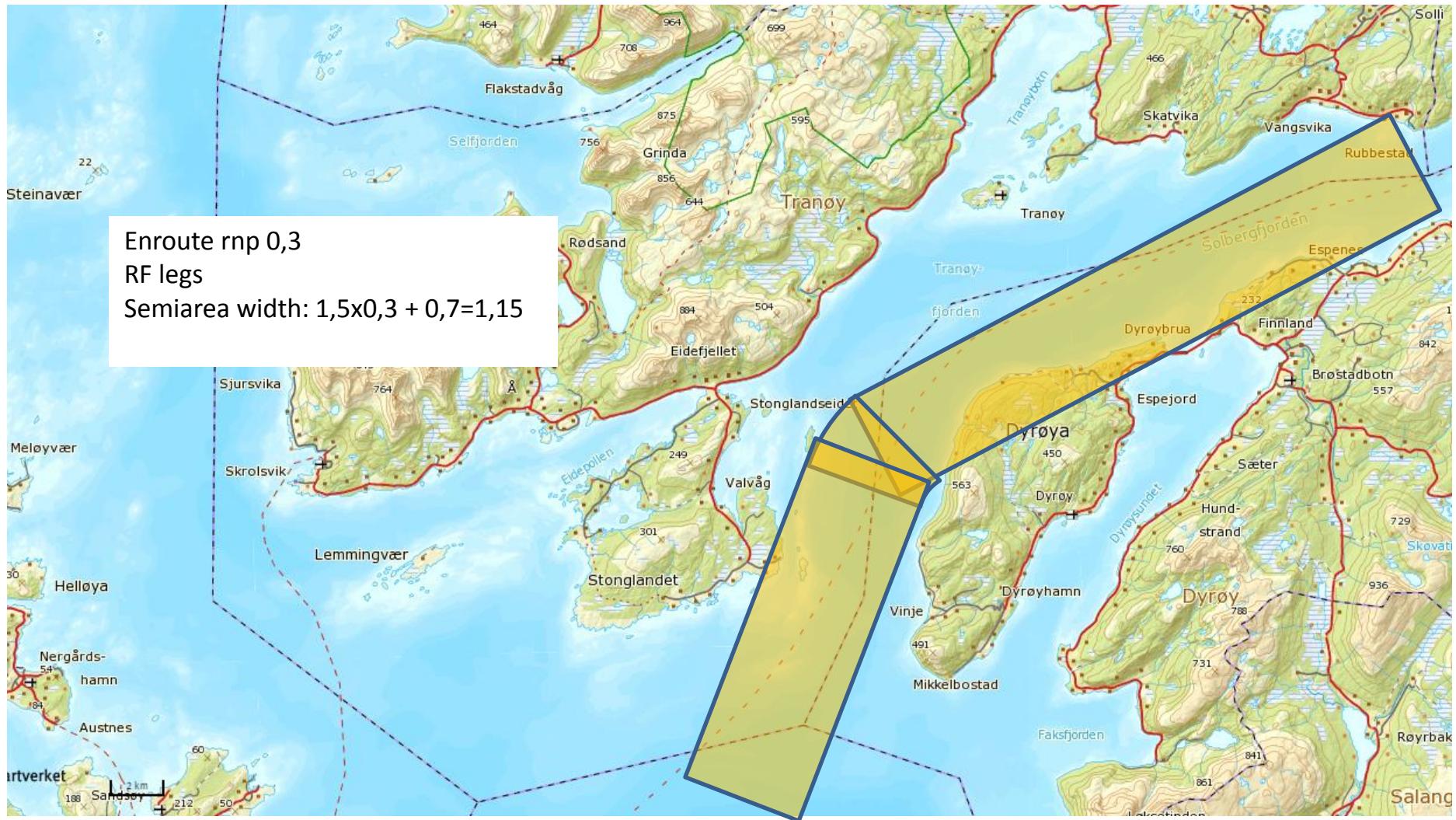


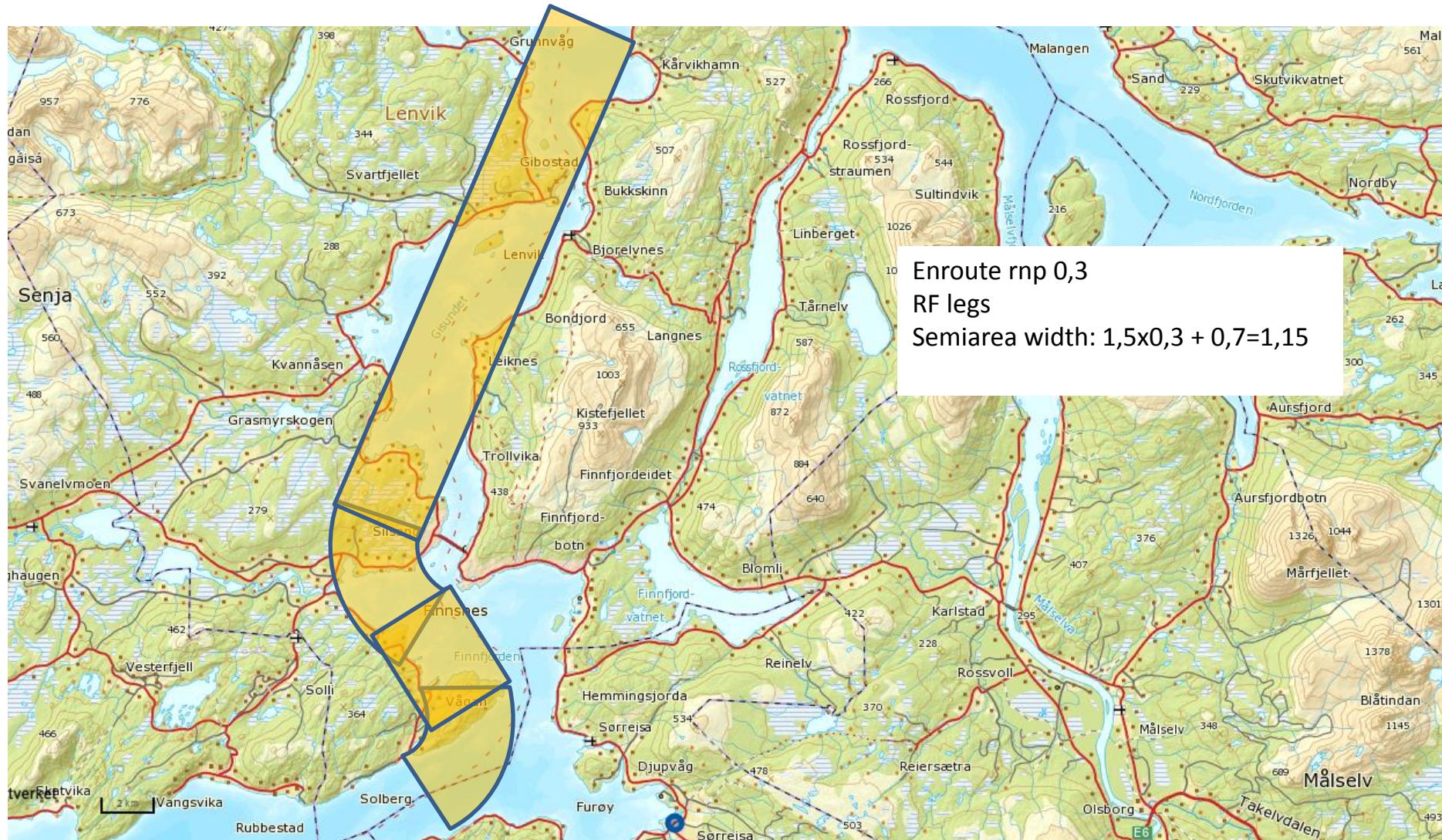


Enroute rnp 0,3  
RF legs  
Semiarea width:  $1,5 \times 0,3 + 0,7 = 1,15$



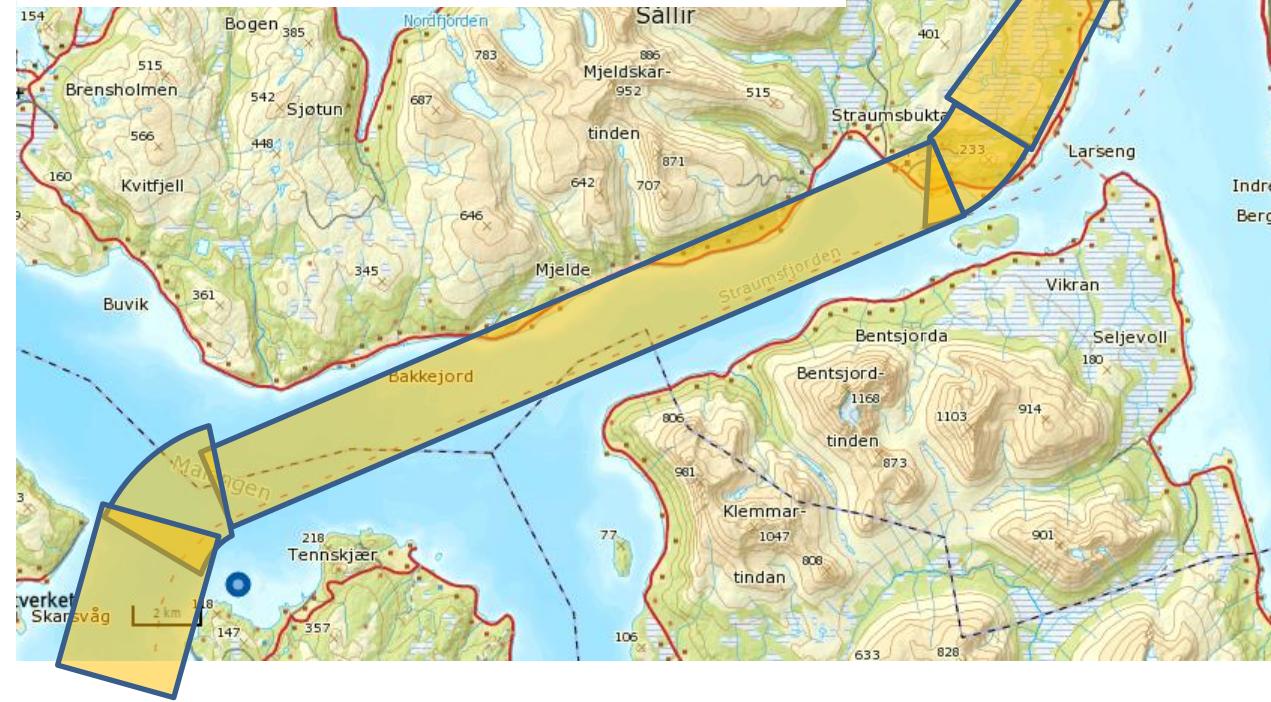
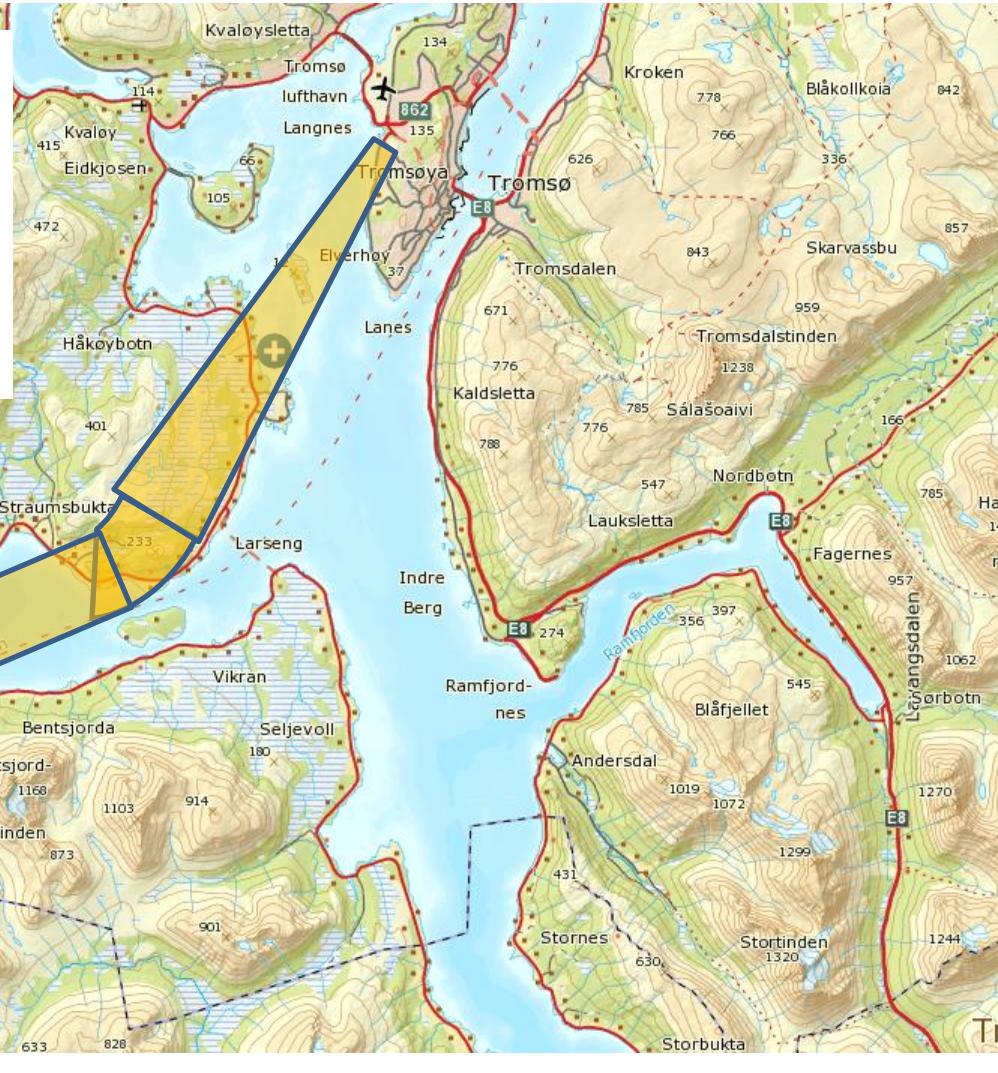
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RF legs  
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## Enroute rnp 0,3

- RF legs
- Within 30 nm HRP
- Semiarea width:  $1,5 \times 0,3 + 0,35 = 0,8$
- LP approach
- Missed approach rnp 0,3



# Weather info outside airports

- HEMS WX
  - QNH reporting
  - Temperature report
  - Visibility reporting



**ENDH**  
Drammen Sykehus

Drammen Sykehus

5.7°C 29.1.2016 986hPa  
22:04 21:50 22:04

3m37s 17m5s 3m38s

5.6°C 29.1.2016 986hPa  
22:08 22:06 22:08

40s 2m48s 41s

-15 min +15 min Latest

OVERLAY IDEAL

A circular wind rose diagram divided into eight segments. The segments are labeled with directions: W, NW, S, SE, E, NE, and two unlabeled segments between NE and E, and between E and SE. In the center of the rose is a red camera icon with a white outline. The segment labeled 'S' is highlighted with a blue background and a white border. Below the rose are three buttons: '-15 min', '+15 min', and 'Latest'. At the bottom left is a small 'OVERLAY' button with a waveform icon, and at the bottom right is a small 'IDEAL' button with a landscape icon.

Drammen Sykehus

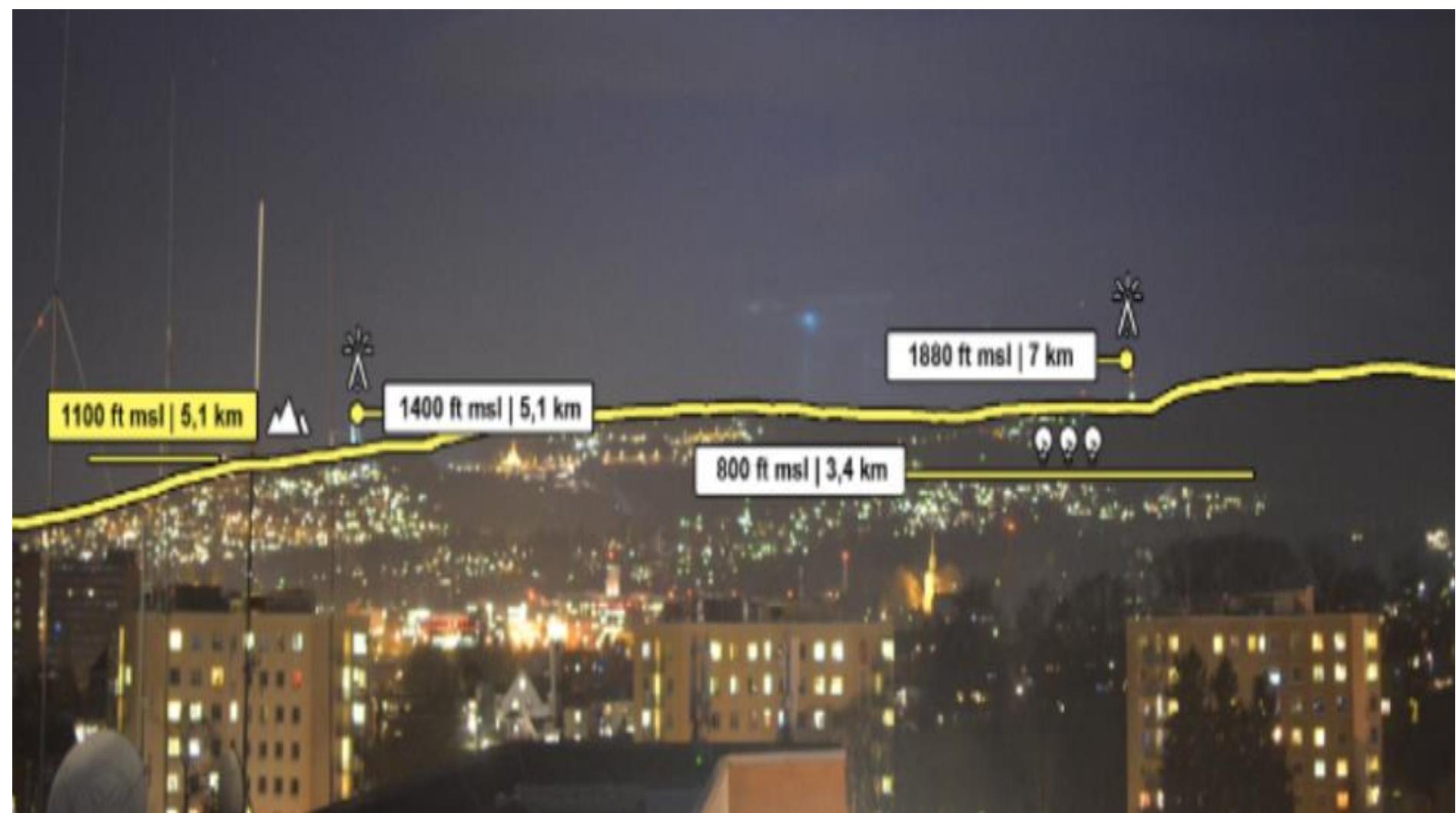
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# Utfordringer

- Manglende regelverk
  - Mangler EASA regler
  - Bestemmelsene følger ikke teknologi og operasjon
- Avtaler med eier av luftrom og infrastruktur.
  - AVINOR bør kunne koordinere avtaler med lokal ATC
  - Krever avtale med ESSP før bruk av EGNOS.signalet
- Deviations fra PANS OPS
  - Norge er ikke som andre land
  - Terreng krever tilpasninger
- Korridorbredder
  - RNP0,3 enroute for helikopter
  - Ingen 0,3 nm for initial og intermediate segment
- Visuelt segment
  - Proceed visually/VFR
  - Enklere regler



HOLY COW !!  
WOTTA MESS !!