

First RNP AR H Procedures & Drone Operations

Challenges and solutions driven by the patient's needs

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Any weather



Anytime

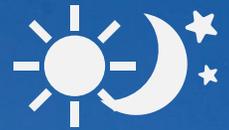


Anywhere



Search for Rescue

Provide emergency assistance in every situation to save lives of all people in distress.



Locating the patient | Rega Drone





1. NEW MISSION

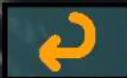
2. EDIT PATH

3. UPLOAD MISSION

4. START MISSION

5. MISSION PROGRESS

6. MISSION COMPLETE



RELATIVE ALTITUDE ▾

ALTITUDE:

ROW DISTANCE:

WAYPOINTS DIST:

MAX VELOCITY:

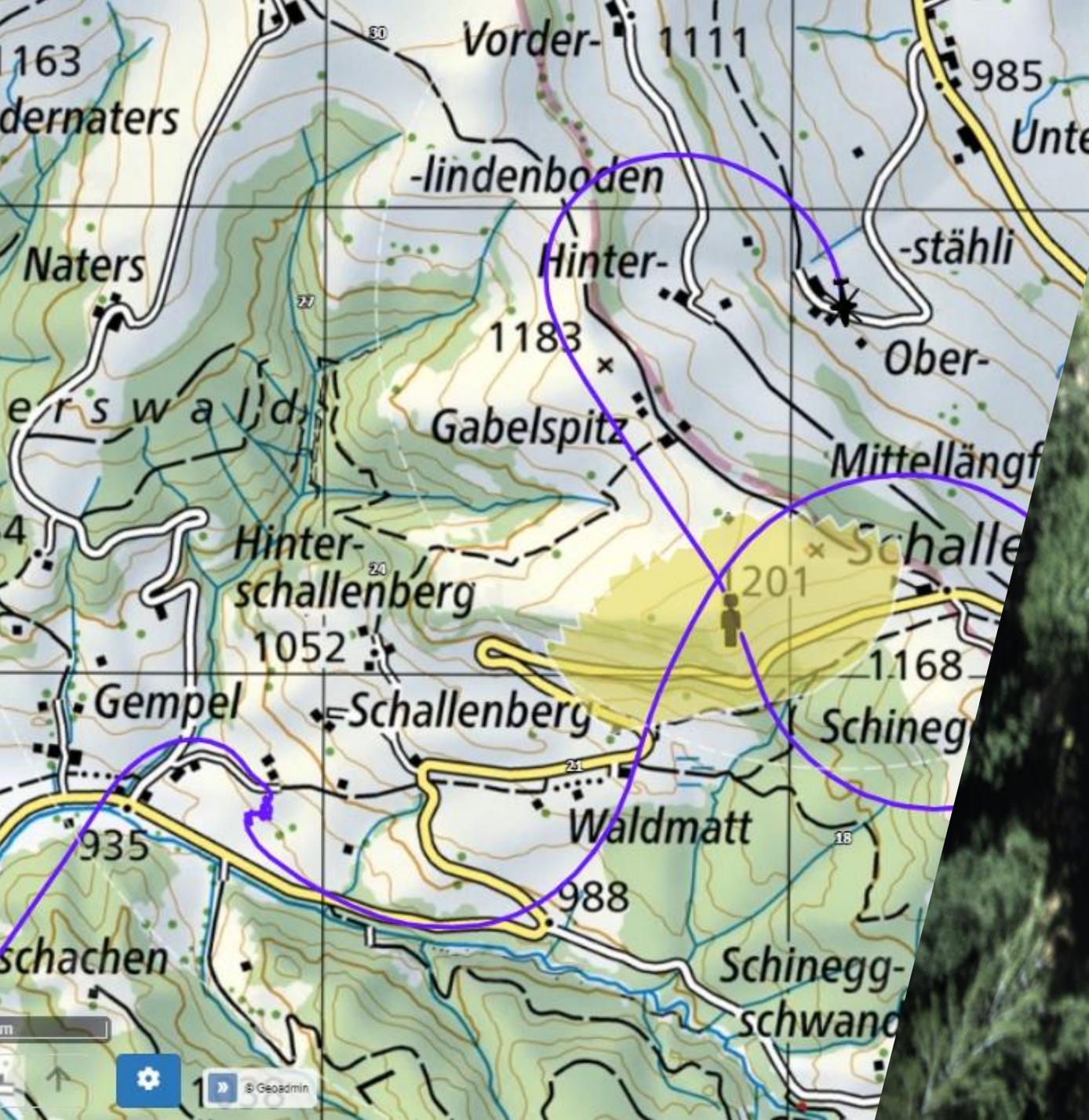
TOTAL DISTANCE 0(m)

HIGHEST POINT 0(m)

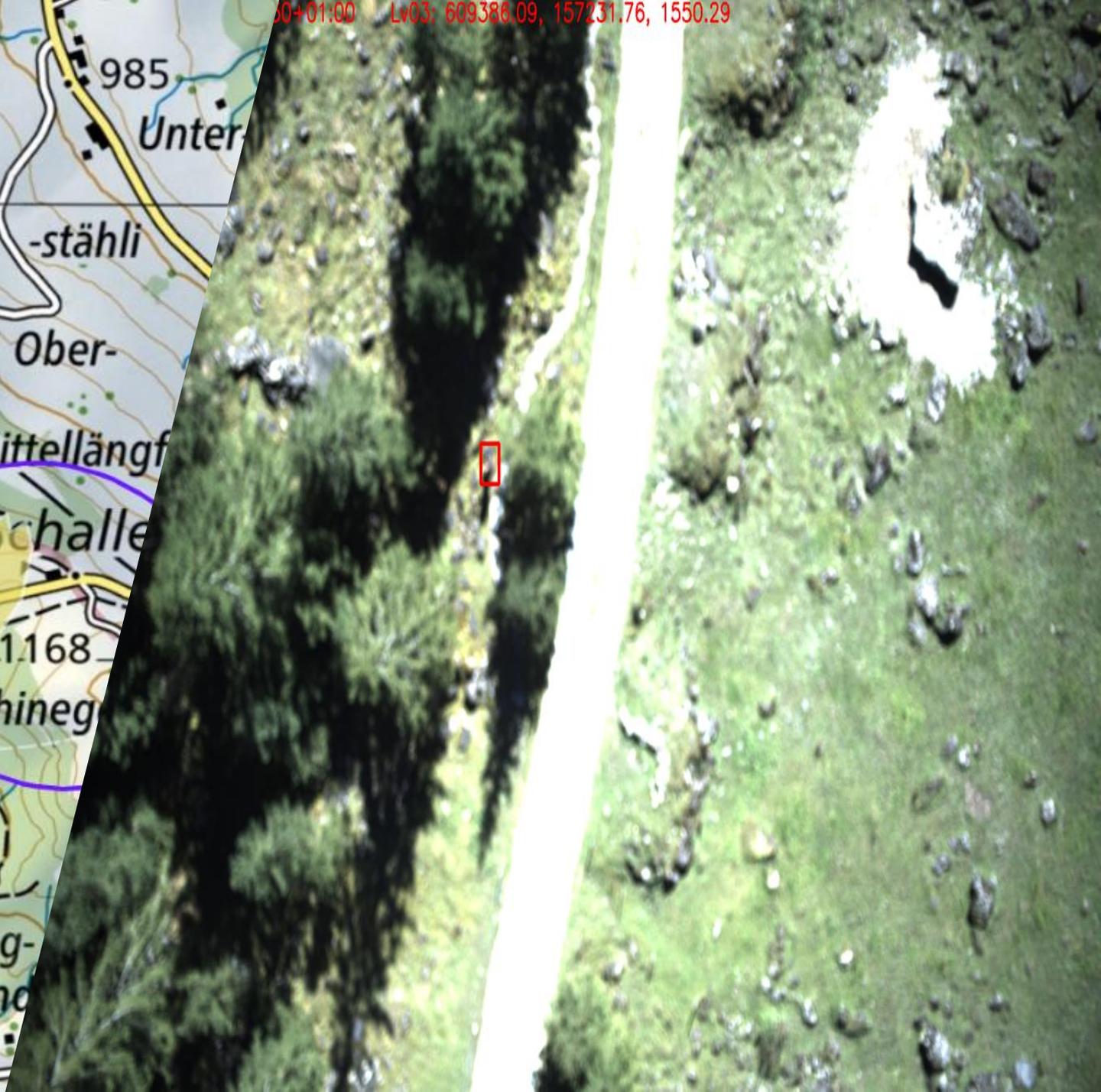
LOWEST POINT 0(m)

CIRCULAR MISSION





50+01:00 Lv03: 609386.09, 157231.76, 1550.29



terraXcube

Temperature	19.4	°C
Relative humidity	66.65	% rH
Absolute pressure	9.860	mbar
Altitude	9.15	m
O ₂ concentration	20.9	%
CO ₂ concentration	459	ppm
Wind speed	0.00	m/s





Any weather



Anytime



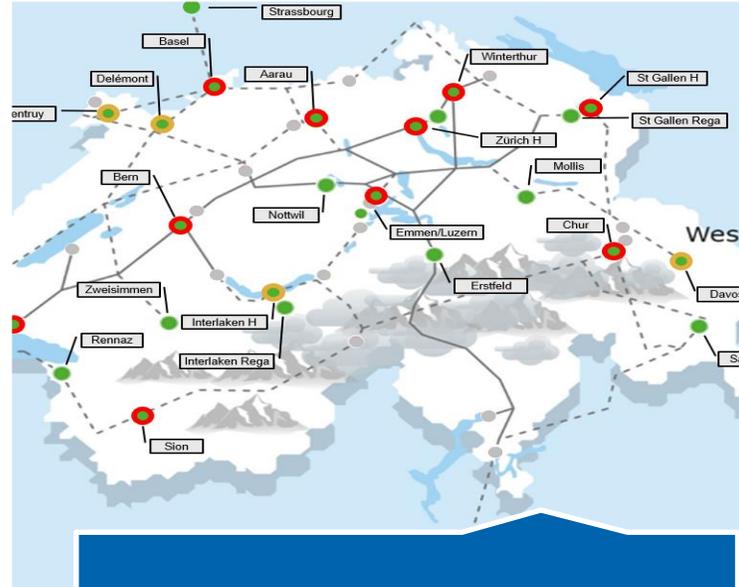
Anywhere



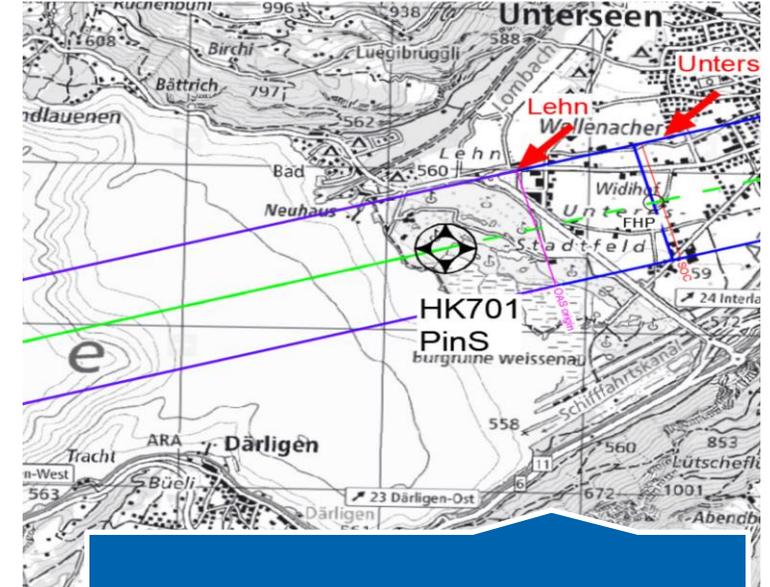
The advanced “Low Flight Network” (LFN)



Vision



Plan



Implementation

Vision: Helicopter instrument flight procedures in an ambitious landscape



Planning

- Trauma centres
- Max care provider

Locations for LFN IFR PBN procedures



- IFR
- PBN
- RNP 0.3

Aircraft capabilities



- Regions
- Airspace design

IFR routes



- Locations
- Routes
- Existing Wx network

Weather information



- CNS study
- Traffic flow management

Air traffic management

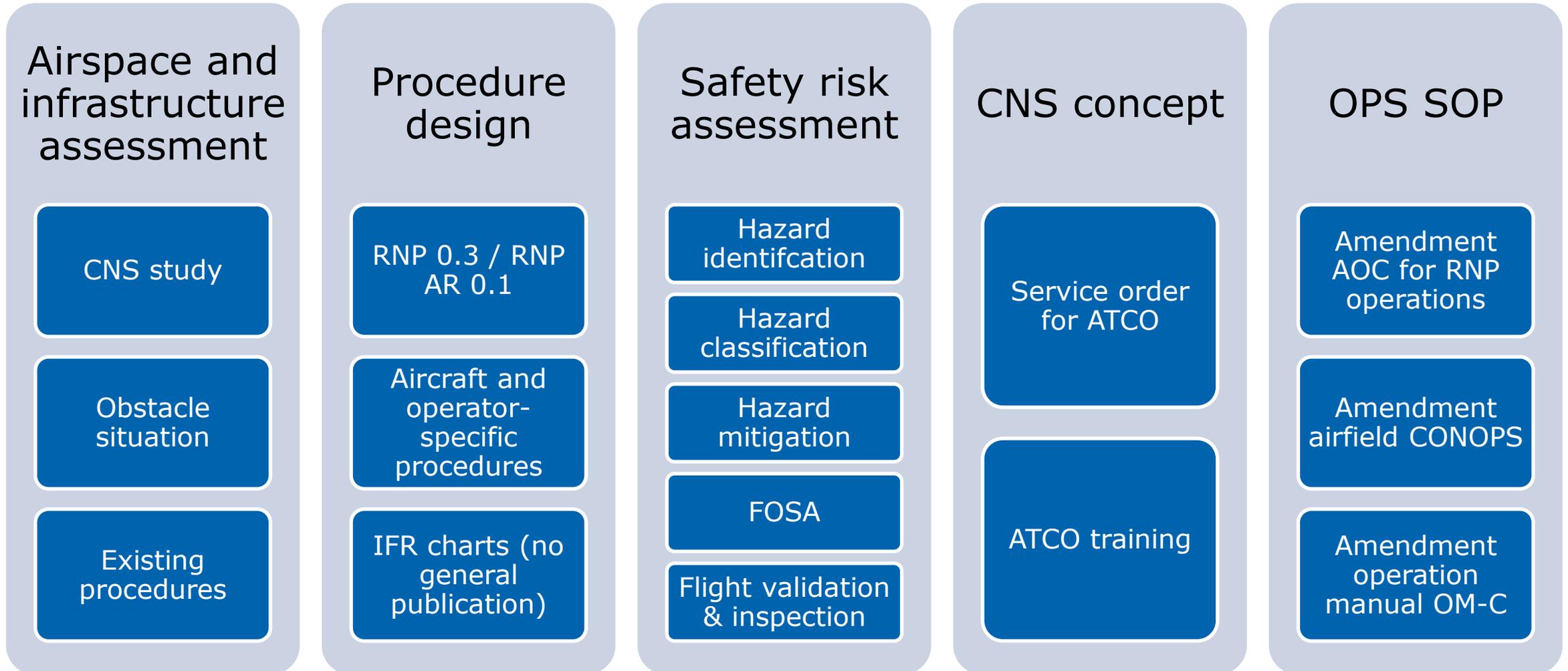


- SMS
- Reporting
- Monitoring

QM



Implementation



Flight Operation Safety Assessment



Procedure

- RNP AR approach design
- RNP AR departure design
- PinS phases



Aircraft

- FMS limitations
- Performance
- Failure conditions
- System failures
- Air data system
- MEL



Navigation

- Navigation database
- ATC operations



Flight crew

- Qualification
- Failure situations
- MAS
- Poor meteo conditions



Infrastructure

- Helipad
- GNSS satellite failure
- Loss of GNSS signal
- Ground nav aids



Operating conditions

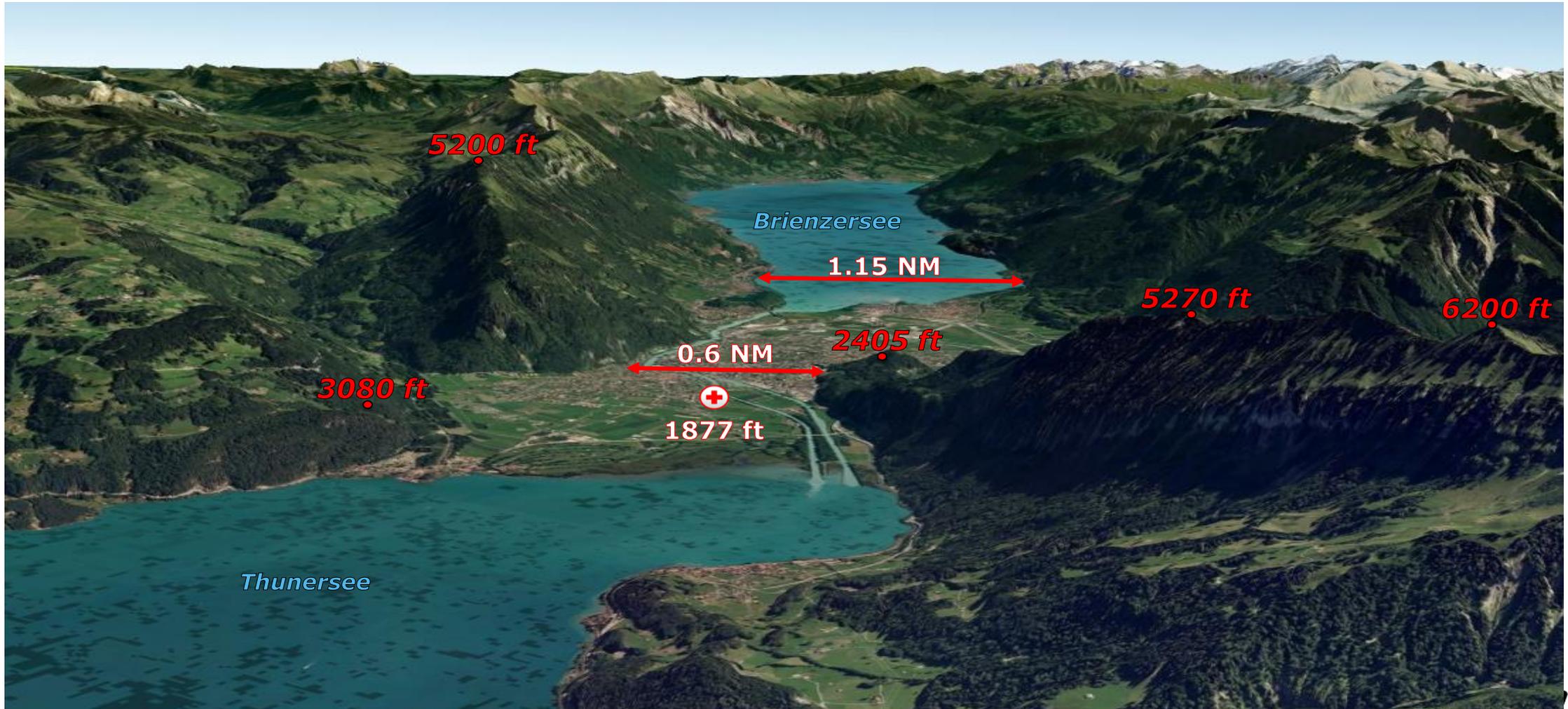
- Tailwind
- Wind conditions & effect on FTE
- Extreme Wx
- AWOS



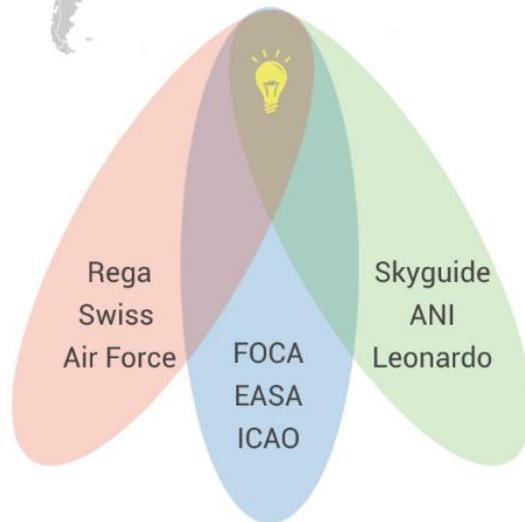
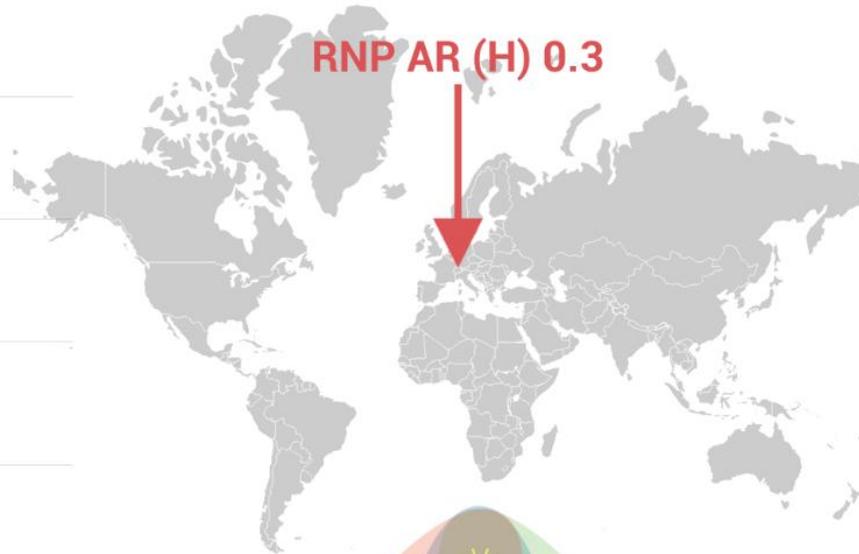
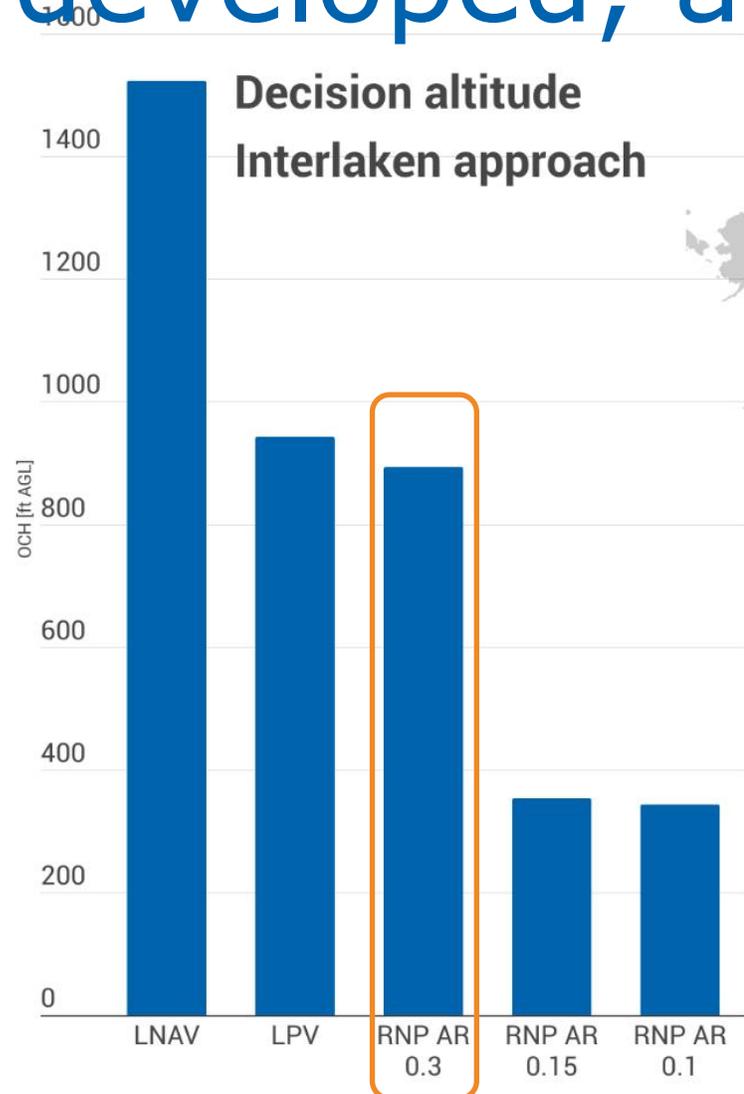
Airspace

- Structure
- Aerodromes
- Other users

A reasonable IFR approach to Interlaken hospital under current regulations did not exist



Worldwide new flight procedure criteria developed, approved and in operation

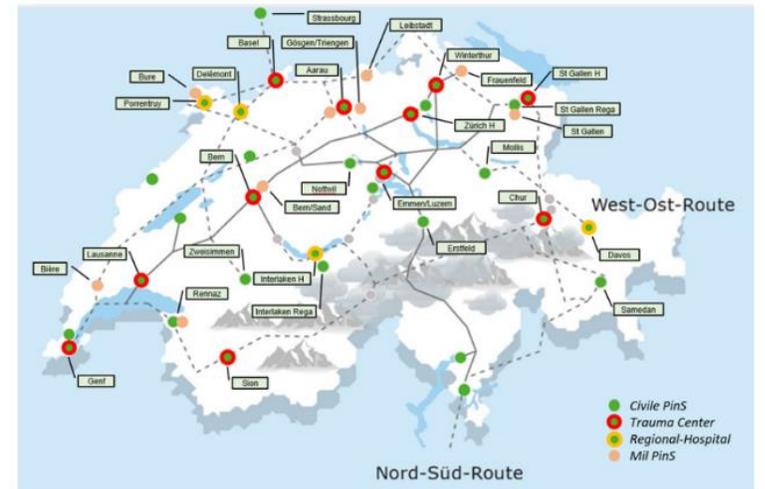


Certification

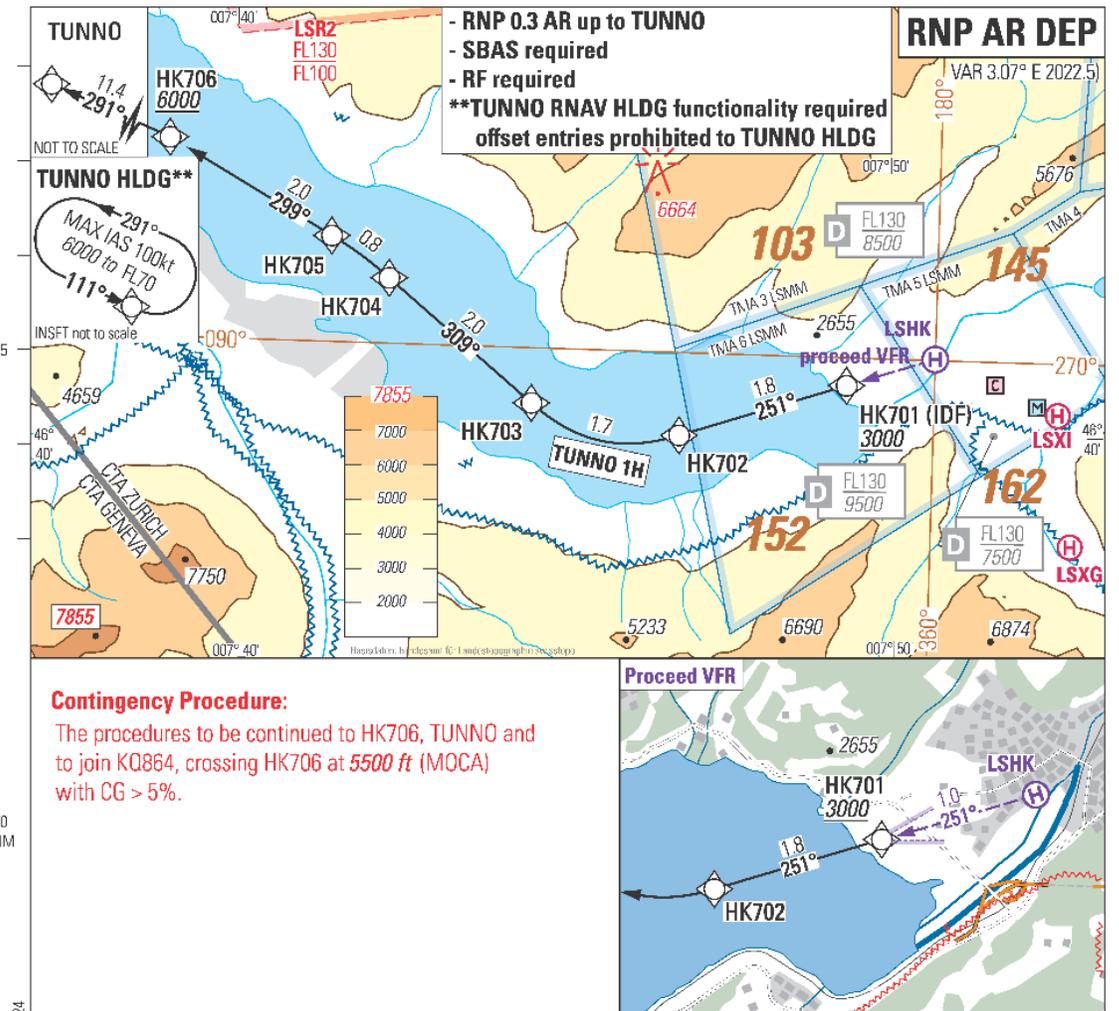
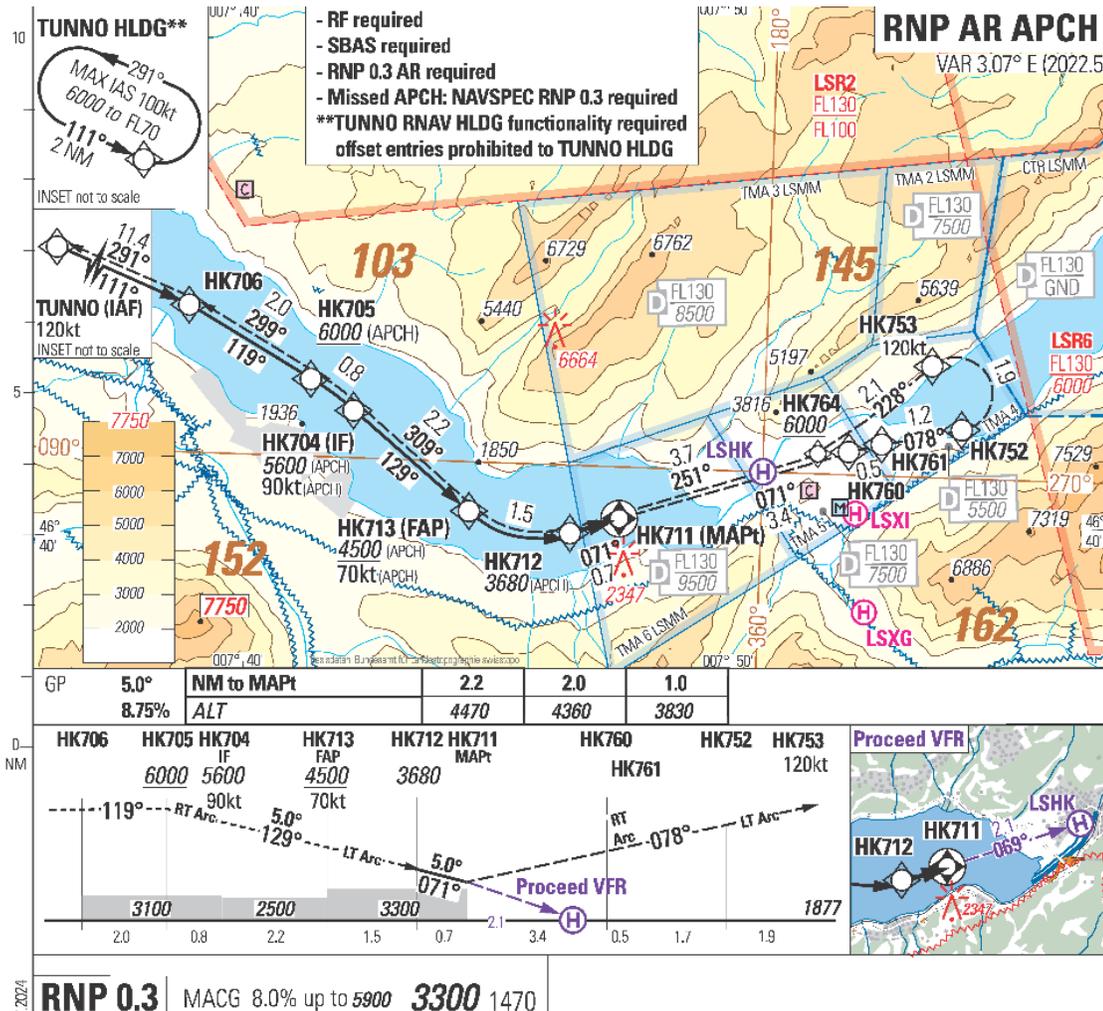
RNP 0.3



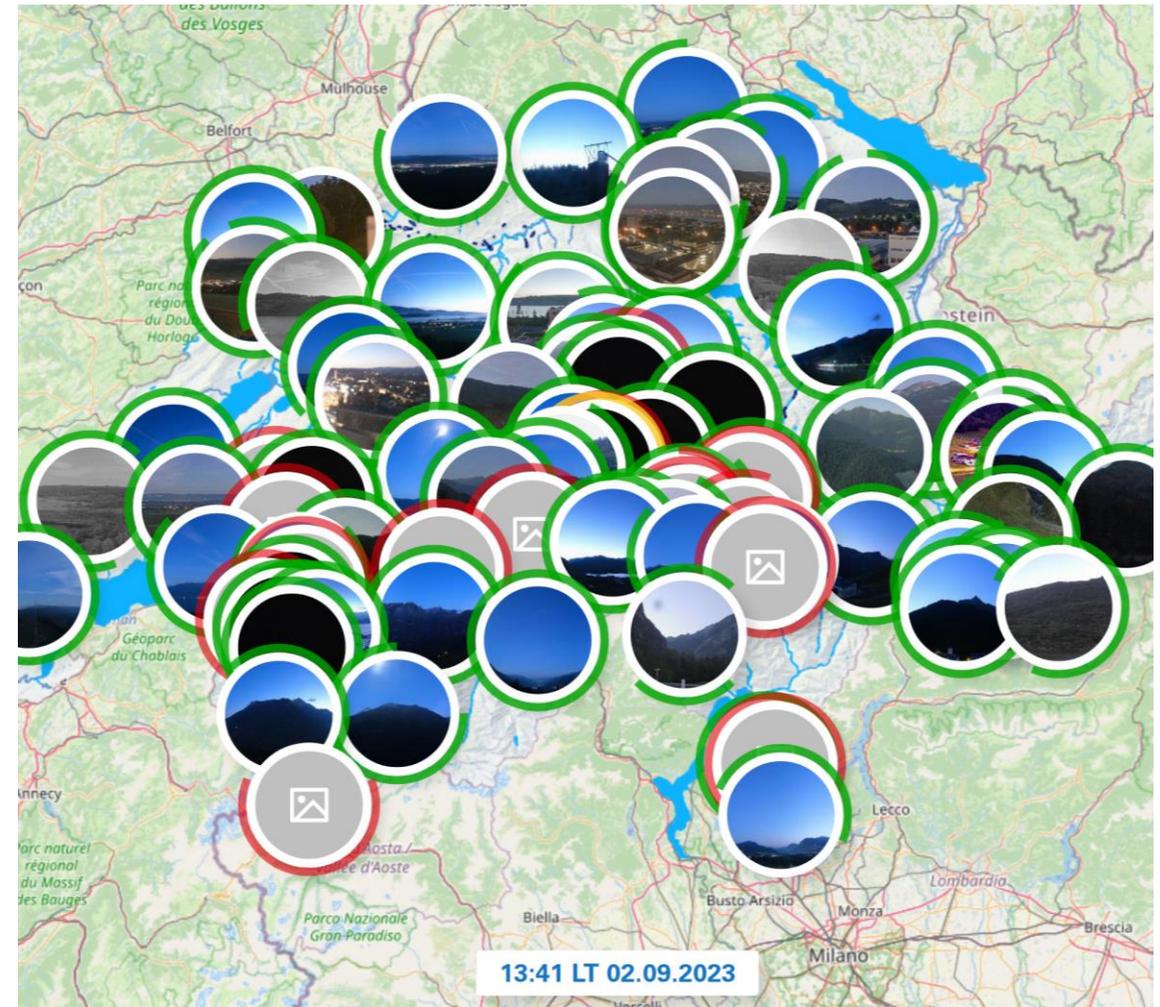
RNP AR 0.1



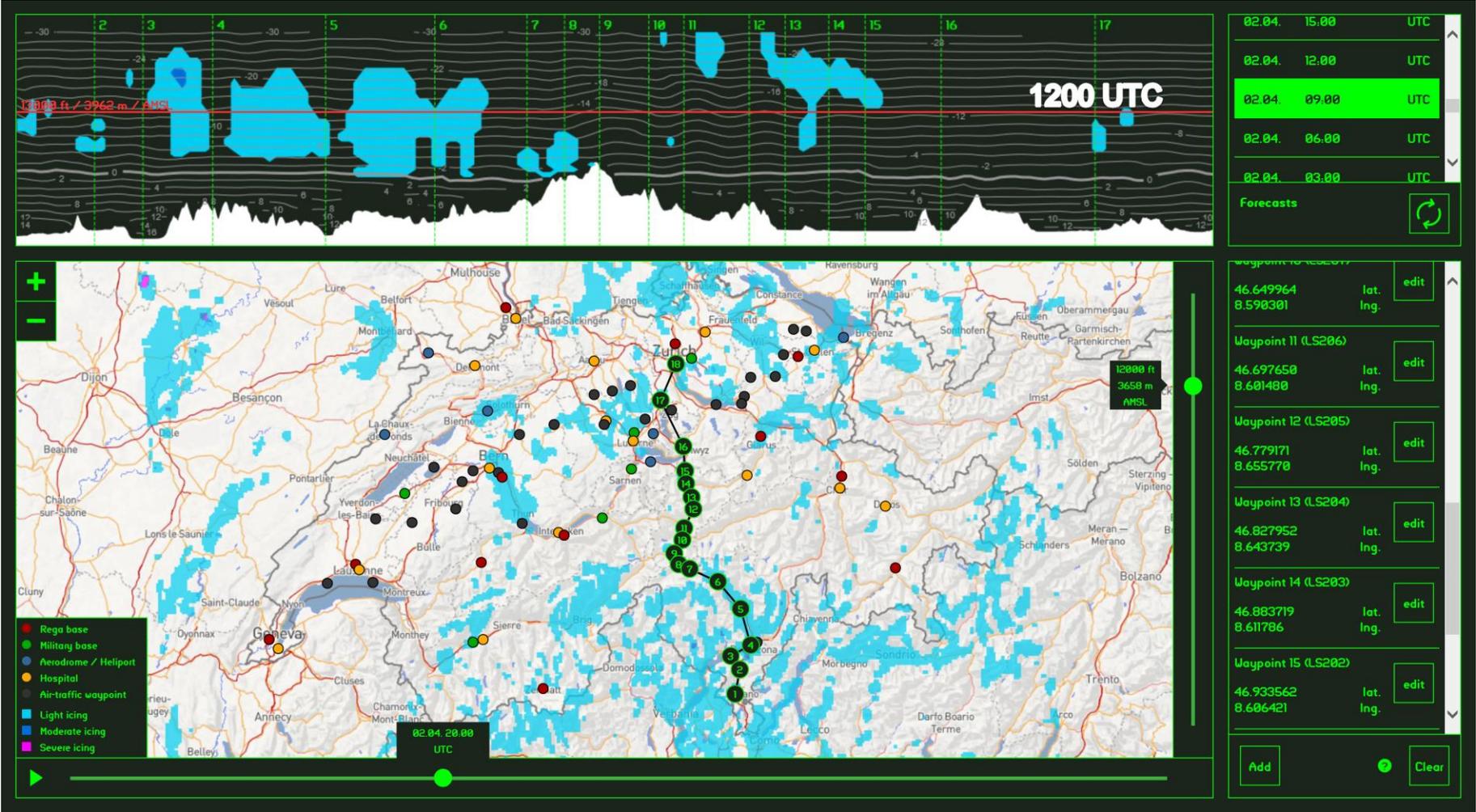
Worldwide 1st RNP AR 0.3 (H) procedure in Interlaken, Switzerland



Rega meteorological network



Risk mitigation: Icing prediction



LFN OPS concept at a glance

Processes

- Priority
- Sector usage
- Communication:
 - 130.800 MHz
 - TWR FREQ

ATM Coordination

- Flight plan
- CTR/TMA in active air space H24/HX:
 - Authorisation by ATC required
- Inactive airspace HX:
 - Blind calls and monitoring
- Outside CTR/TMA
 - Daily airspace bulletin
 - Coordination with SAF

Infrastructure

- APCH/LDG
 - Directly connected to the LFN or LINK connections only via PBN procedures
- Departures
 - Directly connected or LINK connection only via SID
- VFR minima for all not directly connected procedures

Miscellaneous

- Meteo
 - QNH for all routes
 - Current Wx report for all landing sites/ heliports
- Contingency
 - Emergency FREQ: 121.5 MHz
 - Transponder code: 7700
- Training
 - Rega & SAF pilots
 - Rega MCC

Current challenges

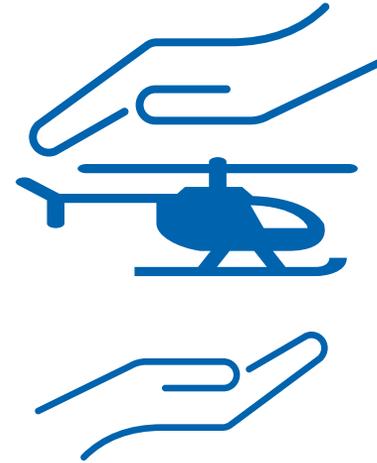


Meaningful regulatory oversight

National authorities may have difficulties to cope with the amount and complexity of the current PBN regulation

Application of the regulations have to be evidence-based and performance-based

Innovations – especially enabling safe and reliable PBN flight procedures to save lives – must not be hampered, but promoted



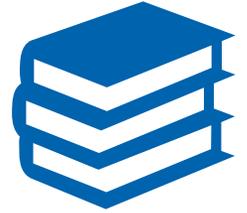
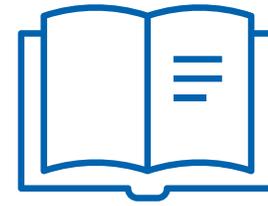
Meaningful company culture & safety management

Awareness & knowledge

Safety risk assessments

Just culture endangered

Literature



- PANS-ATM (Doc 4444)
- PANS-Ops (Doc 8168)
- PBN Manual (Doc 9613)
- GNSS Manual (Doc 9849)
- RNP AR Procedure Design Manual (Doc 9905)
- CDO Manual (Doc 9931)
- Manual on Use of PBN in Airspace Design (Doc 9992)
- CCO Manual (Doc 9993)
- Procedure QA Manual (Doc 9906)
- PBN Ops Approval Manual (Doc 9997)

Thank you

