Operationelle Aspekte
GNSS Based Helicopter IFR Operation in Alpine Valleys

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Helicopter-Recording-Random-Flight
Agenda

- Operational Aspects
- Low-Flight Network in Switzerland
- Procedure Design in Mountainous Areas
- PBN Enroute and Point in Space
- Approach to Samedan (LSZS)
- Conclusion
Operational Aspects

- 24h/7d/365d HEMS
- Demanding area with appropriate environmental conditions
- High cruising altitude - with OAT below freezing
- Low 0 °C ~ 8% canceled missions due to poor visual flying weather
Typical winter and autumn weather
Operational Aspects

- Mountain passes partially obscured by clouds
- Between SS and SR better to fly LFN than NVIS between terrain and ceiling
- Safer operation due to pre-defined routes
Operational Aspects

- Possibility of LFN access allows safe planning in case of marginal and/or unclear weather conditions
- Transition from VFR on top to hospital PInS approaches
LFN Enroute and Point in Space (PinS)
Procedure Design in Mountainous Areas

Primary Protection Area

Secondary Protection Area

Reference: Skyguide Presentation (M. Troller)
ION GNSS 2016; Session F5: Aerospace Applications 1
Low-Flight Network in Switzerland

ME 12'000 ft (RNP 0.3)
Approach to LSHI, Hospital Insel
Approach to LSZS, Samedan (RNP 0.1)
**GNSS Data acquisition**

- Installation of miniQAR recorder
- Collection of NAV-Data (GPS, AHRS, FMS)
- Temporary installation of additional GPS/GLONASS receiver
- Comparison of deviation to actual flight path (Total System Error)

- > 30’000 flights during normal HEMS Ops recorded
- ...some of them using the LFN
- Each LFN leg has been analysed specifically
Conclusion

- First step of the LFN has been implemented successfully in Switzerland!
- ATS-LFN access is still demanding
- Crews have to be trained accordingly
- Helicopter is limited in range and altitude
- Icing condition still limits the operation
Thank's the result of the MiniQuar and the data post processing:
- Reliable GNSS coverage and accuracy
- RNP requirements can be achieved
- RNP 0.1 is crucial for acceptable GNSS-Approaches in mountainous area

Technology exists, Flight Ops would like to use it!
Thank you for your kind attention