Surveillance with HF Communications Separation

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Doc 4444



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This edition supersedes, on 10 November 2016, all previous editions of Doc 4444.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

- 8.7.4 Separation minima using ATS surveillance systems where VHF voice communications are not available
- 8.7.4.1 Where direct controller-pilot VHF voice communications are not available, separation minima described in
- 8.7.4.2, 8.7.4.3 and 8.7.4.4 may be applied utilizing positioning information derived from an ATS surveillance system,
- provided the following requirements are met:
- a) a navigational performance of RNP 4 or RNP 2 shall be prescribed;
- b) the communication system shall satisfy RCP 240;



ASEPS CRM A22 Comm & Intervention Model



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SurvHF CRM Timing & Intervention Model (TIM)

•Thanks to the many ISPACG and IPACG ANSPs that provided data to support the development of this HF TIM.



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SurvHF CRM Parameters

Parameter name	Variable name	Value
Probability of a deviation	Ω	7e-5 deviations per flight hour
Occupancy	Е	1
Aircraft size	λx	211ft (0.0348NM)
Longitudinal sampling distance	dx	120NM
Probability of vertical overlap	P _z (0)	0.5
RNP	σ	4NM
NACp	ρ	5 (0.5NM accuracy)
Aircraft velocity	V1, V2	Distribution around 480kts
Timing	τ	HF04; Figure 2
Update interval	Tp	15s 95%; 60s max*
Latency of update	Tı	9s
Mean deviation angle	Θ	16°
Multiple parallel tracks	к	10
Alert distance	ds	1 beyond SLOP
SLOP offset	SLOP	Distribution of 0, 1, 2 NM

Table 1: Parameter names and values that are used as inputs to the Collision Risk Model.

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SurvHF Tentative Separation Minima

• 23 NM Lateral Minima

• 17 NM Longitudinal Minima





SurvHF Main Benefits

- Backup Separation Minima for RCP 240 outages.
 - No need to revert to much larger RNAV10 lateral and conventional time based separation.
 - Promote the development of improved route systems

• Improve airspace efficiency.

- Offer more efficient separation minima to non-PBCS approved aircraft.
- It takes Two to Tango, both aircraft must have the right approvals to apply a minima.



SASP SurvHF minima efforts

- FAA conducted initial Collision Risk Modelling for SASP.
- The SASP Math Sub-Group reviewed the FAA SurvHF (SBAHF) papers and they provided input and agreed with the FAA work on the CRM.
- SASP submitted a Job Card to the ANC to begin work on a SurvHF minima.
- The ANC rejected the Job Card and they provided ICAO references that allow an ANSP to develop their own contingency separation minima.
- The ICAO references are provided in the paper.



Contingency SurvHF minima efforts

- The FAA considers that SBA HF minima would be very useful as global safety/ separation tools that could serve as an efficient backup to the separation minima with RCP 240 requirements when occasional network outages occur.
- As ICAO has rejected the Job Card to develop a global SBA HF minima, but highlighted that ICAO guidance enables States to develop their own contingency separations, the FAA would like to pursue a regional adoption of a Surveillance with HF communications minima.



SASP SurvHF minima efforts

- The Surveillance with HF communications minima Collision Risk Modelling is very mature and ready to be progressed.
- The FAA would like to work with ISPACG and IPACG members who are interested in adopting these contingency separation minima to develop regional procedures, which would allow the Surveillance with HF communications minima to be used across FIR boundaries utilizing the same procedural requirements.



SASP SurvHF minima efforts

- ISPACG and IPACG ANSPs that are interested in working together to develop regional Surveillance with HF communications contingency separation minima should advise the FAA of their interest.
- If there is sufficient interest in pursuing a Surveillance with HF communications regional contingency separation minima, consider establishing a joint IPACG/ISPACG workgroup to work on Surveillance with HF communications procedures and publication in the Regional SUPPS.





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