Required communication performance (RCP) and required surveillance performance (RSP) specifications:

### **GOLD Appendices B and C**

ICAO Seminar/Workshop on the Implementation of Ground-ground and Air-ground Data Links in the SAM Region

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Federal Aviation Administration

#### Contents

- Overview of RCP/RSP Specifications
- Appendix B : RCP Specifications
  - RCP 240
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  - RSP 180
  - RSP 400



# **RCP/RSP Specifications**

- In general, RCP/RSP specifications provide a means of compliance
- The specifications support:
  - a) Safety oversight of ATS provisions and operations
  - b) Agreements/contractual arrangements that ATS providers and aircraft operators make with respective CSPs
  - c) Operational authorizations, flight crew training and qualification;
  - d) Design approval of aircraft data link systems
  - e) Operational-monitoring, analysis, and exchange of operational data among regions and states



# **RCP/RSP Specifications**

- RCP/RSP specifications are mainly derived from a safety assessment but in some cases, may include criteria to support operational efficiency and orderly flow of air traffic
  - RCP/RSP specifications will then indicate the distinction between <u>safety</u> and <u>efficiency</u>
- RCP/RSP specifications include allocations for data communications
  - For RCP: "/D" indicates the RCP allocations associated with CPDLC application
  - For RSP: "/D" indicates the surveillance performance allocations associated with the ADS-C or FMC WPR application



# **RCP/RSP Specifications**

#### There are 4 aspects within each of the RCP/RSP specifications:

#### 1) TIME -

- RCP <u>Expiration time</u> (ET): maximum time for the completion of the operational communication transaction after which the initiator is required to revert to an alternative procedure
- RCP <u>Nominal time</u> (TT 95%): maximum nominal time within which 95% of operational communication transactions is required to be completed
- RSP <u>Overdue delivery time</u> (OT): maximum time for the successful delivery of surveillance data after which the initiator is required to revert to an alternative procedure
- RSP <u>Surveillance nominal delivery time</u> (DT 95%): maximum nominal time within which 95% of surveillance data is required to be successfully delivered
- 2) CONTINUITY required probability that an operational communication transaction can be completed within the communication transaction time, either ET or TT 95%, given that the service was available at the start of the transaction
- 3) AVAILABILITY required probability that an operational communication transaction can be initiated when needed
- 4) INTEGRITY required probability that an operational communication transaction is completed with no undetected errors

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## Appendix B – RCP 240

Transaction time (sec)	Continuity (C)	Availability (A)	Integrity (I)		
ET = 240	C(ET) = 0.999	0.999 (safety)	Malfunction* = 10 <sup>-5</sup> per flight hour		
TT 95% = 210	C(TT 95%) = 0.95	0.9999 (efficiency)			
* Likelihood of occurrence of one or more undetected errors in a completed communication transaction					

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## Appendix B – RCP 400

Transaction time (sec)	Continuity (C)	Availability (A)	Integrity (I)	
ET = 400	C(ET) = 0.999	0.999 (safety)	Malfunction* =	
TT 95% = 350	C(TT 95%) = 0.95		10 <sup>-5</sup> per flight hour	
* Likelihood of occurrence of one or more undetected errors in a completed communication transaction				





## Appendix C – RSP 180

Transit time (sec)	Continuity (C)	Availability (A)	Integrity (I)	
OT = 180	C(OT) = 0.999	0.999 (safety) 0.9999 (efficiency)	Navigation FOM Time at	e.g. 4 or higher (if RNP 4 is prescribed)
DT 95% = 90	C(DT 95%) = 0.95		accuracy Data integrity	Malfunction* = 10 <sup>-5</sup> per flight hour

\* Likelihood of occurrence of one or more undetected errors in a completed communication transaction

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### Appendix C – RSP 400

Transit time (sec)	Continuity (C)	Availability (A)	Integrity (I)	
OT = 400	C(OT) = 0.999	0.999 (safety)	Navigation FOM	e.g. 10 or higher (if RNP 10 is prescribed)
			Time at position	+/- 1 sec (UTC)
DT 95% = 300	C(DT 95%) = 0.95		Data integrity	Malfunction* = 10 <sup>-5</sup> per flight hour
* Likelihood of occurrence of one or more undetected errors in a completed communication transaction				

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#### **Parameter Allocations**

The total requirements defined for each of the 4 aspects (time, continuity, availability and integrity) are comprised of allocations for 4 system components

- 1) ATSP air traffic service provide
- 2) CSP communication service provider
- 3) Aircraft system
- 4) Aircraft operator



### **Future additions**

- RCP or RSP types may be developed for the data link services in continental airspace in the future
  - The VDL M2 sub-network is the only sub-network that has been prescribed for data link services in continental airspace
- The data link system in continental airspace comprises a variety of ground systems that may provide data link services
- The data link services in continental airspace provide supplemental communications that support more efficient air traffic management and increase airspace capacity



### **Further Information**

- For further information please refer to the Global Operational Data Link Document (GOLD) :
  - Appendix B RCP Specifications
  - Appendix C RSP Specifications

