

IMPLEMENTATION OF PERFORMANCE-BASED COMMUNICATION AND SURVEILLANCE FRAMEWORK
DOCUMENTATION OF COMPLIANCE WITH ANSP ALLOCATIONS

I. Transaction Time/Continuity Requirements

RCP transaction time and continuity criteria					
Specification: RCP 240/D		Application: CPDLC		Component: ANSP	
Transaction time parameter		ET (sec) C = 99.9%	TT (sec) C = 95%	Compliance means	Evidence of compliance
Transaction time value (A to Z)		240	210	Analysis, monitored.	See RCP time allocations below.
RCP time allocations					
1	Initiator (controller/ATSU system) (A to C) + (X to Z)	30	30	Analysis, simulations, safety and human factors assessments.	
2	RCMP (C to X)	210	180	Monitored.	
RCMP time allocations					
3	RCTP (C to D3) + (D4 to X)	150	120	Monitored.	
RCTP time allocations					
4	RCTP _{ATSU} (C to D1) + (D6 to X)	15	10	Pre-implementation demonstration.	
5	RCTP _{CSP} (D1 to D2) + (D5 to 6)	120	100	CSP contract/service agreement. See also paragraph B.2.1.3.	

RSP data delivery time and continuity criteria					
Specification: RSP 180/D		Specification: RSP 180/D		Specification: RSP 180/D	
Data delivery time parameter		OT (sec) C = 99.9%	DT (sec) C = 95%	Compliance means	Evidence of compliance
1	RSMP time allocation	180	90	Monitored.	
RSTP time allocations					
2	RSTP _{ATSU} (D2 to Z)	5	3	Pre-implementation demonstration.	
3	RSTP _{CSP} (D1 to D2)	170	84	CSP contract/service agreement. See also paragraph C.2.1.3.	

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Figure 1. Description of communication transaction time allocations (ICAO Doc 9869, App B)

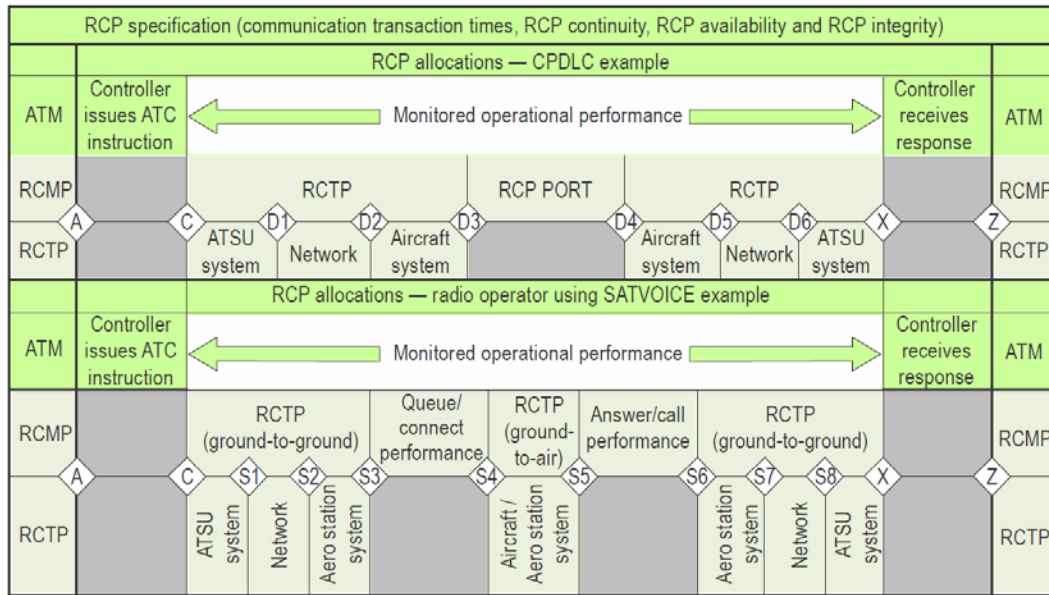
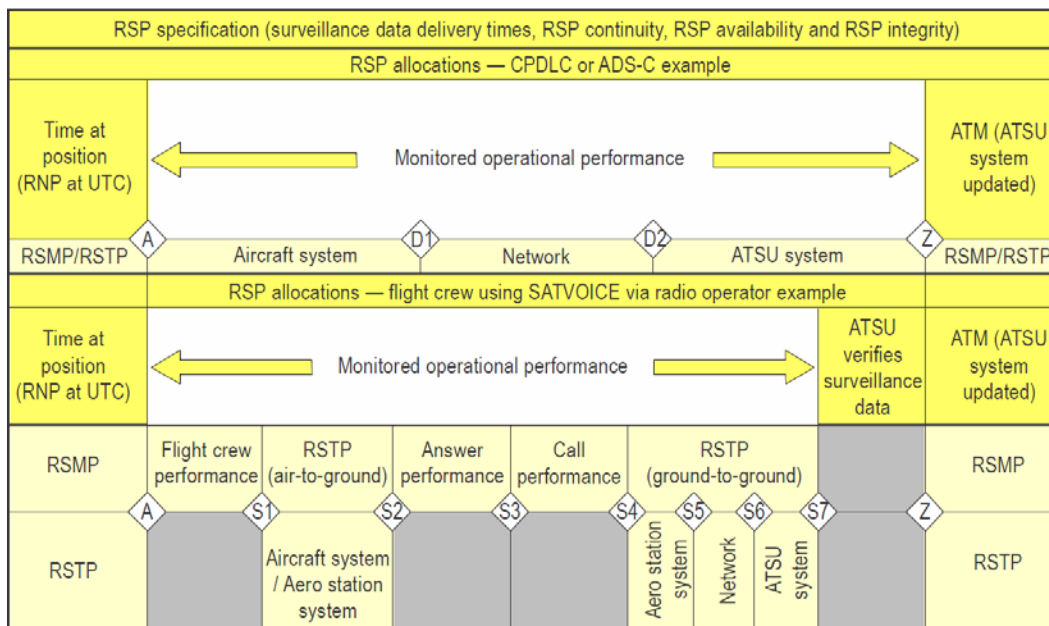


Figure 2. Description of surveillance data delivery allocations (ICAO Doc 9869, App C)



II. Availability Requirements

RCP and RSP availability criteria				
Specification: RCP 240/D RSP180/D		Application: CPDLC ADS-C		Component: ANSP
Availability parameter	Efficiency	Safety	Compliance means	Evidence of compliance
Availability – service ($A_{SERVICE}$)	0.9999	0.999	Contract/service agreement terms. <i>Note 1.</i> – For guidelines to aid in the development of the contract/service agreement with the CSP, see paragraph B.2.1.3, RCP 240/D allocations to CSP for RCP availability criteria and paragraph C.2.1.3, RSP 180/D allocations to CSP for surveillance availability criteria.. <i>Note 2.</i> – The availability criteria are allocated entirely to A_{CSP} and assume that the ATS unit’s system is always available.	

III. Integrity Requirements

RCP and RSP integrity criteria				
Specification: RCP 240/D RSP180/D		Application: CPDLC ADS-C	Component: ANSP	Evidence of compliance
Integrity parameter	Integrity value	Compliance means		
Integrity (I)	Malfunction = 10^{-5} per flight hour	Analysis, safety requirements, development assurance level commensurate with integrity level, (compliance shown prior to operational implementation). See also RCP-related safety requirement SR-26 for the ANSP. CSP contract/service agreement. See also RCP integrity criteria for CSP, paragraph B.2.1.3.		

IV. Monitoring and Alerting Requirements

RCP monitoring and alerting criteria			
Specification: RCP 240/D		Application: CPDLC	Component: ANSP
Ref:	Criteria	Compliance means	Evidence of compliance
MA-1a CPDLC	The ground system shall be capable of detecting ground system failures and configuration changes causing the communication service to no longer meet the requirements for the intended function. <i>Note. — If changes are made to the system capacity limits, as specified by the airspace requirements, and the changes cause the system to perform below the RCP specification, this would be considered a change in system configuration.</i>	System design, implementation. CSP contract/service agreement. See also paragraph B.2.1.3, RCP availability criteria.	
MA-1b CPDLC	When the communication service no longer meets the requirements for the intended function, the ground system shall provide indication to the controller.	System design, implementation. CSP contract/service agreement. See also paragraph B.2.1.3, RCP availability criteria.	
MA-2 CPDLC	When the controller receives an indication that the communication service no longer meets the requirements for the intended function (e.g. reduced longitudinal separation), the controller shall take action to resolve the situation (e.g. apply an alternative form of separation).	System design, procedures, implementation.	
Specification: RSP180/D		Application: ADS-C	Component: ANSP
Ref:	Criteria	Compliance means	Evidence of compliance
MA-1a ADS-C	The ground system shall be capable of detecting ground system failures and configuration changes causing ADS-C to no longer meet the requirements for the intended function. <i>Note. — If changes are made to the system capacity limits, as specified by the airspace requirements, and the changes cause the system to perform below the RSP specification, this would be considered a change in system configuration.</i>	System design, implementation. CSP contract/service agreement. See also paragraph C.2.1.3, surveillance availability criteria.	
MA-1b ADS-C	When ADS-C no longer meets the requirements for the intended function, the ground system shall provide indication to the controller.	System design, implementation. CSP contract/service agreement. See also paragraph C.2.1.3, surveillance availability criteria.	
MA-2 ADS-C	When the controller receives an indication that ADS-C no longer meets the requirements for the intended function (e.g. reduced longitudinal separation), the controller shall take action to resolve the situation, (e.g. apply an alternative form of separation).	System design, procedures, implementation	

V. Safety Requirements

RCP-related/RSP-related safety requirements			
Specification: RCP 240/D RSP180/D		Application: CPDLC ADS-C	Component: ANSP
Ref:	Related RCP parameter	Safety requirement	Evidence of compliance
SR-1a (ANSP)	A	The ATS unit shall display the indication provided by the aircraft system when a data link service request initiated by the ground system or the controller is rejected at the application layer.	
SR-1b (ANSP)	A	The ATS unit shall provide the aircraft system with an indication when it rejects a data link service request initiated by the flight crew at the application layer.	
SR-2 (ANSP)	A, C	The ATS unit shall advise the controller of a detected data link service loss.	
SR-3 (ANSP)	A	Data link service shall be established in sufficient time to be available for operational use.	
SR-4 (ANSP)	A, C	The ATS unit shall be notified of data link service planned outages sufficiently ahead of time.	
SR-5 (ANSP)	A, C	The ATS unit shall advise the controller when a message cannot be successfully transmitted.	
SR-6 (ANSP)	C, I	The ATS unit end system shall provide the unambiguous and unique identification of the origin and destination with each message it transmits.	
SR-7 (ANSP)	C, I	The ATS unit shall indicate in each response to which messages it refers.	
SR-8 (ANSP)	I	The ATS unit shall send the route clearance information with the route clearance via data link.	
SR-9 (ANSP)	C, I	The ATS unit end system shall timestamp (to within one second UTC) each message when it is released for onward transmission.	
SR-11 (ANSP)	C, I	Any processing performed by the ATS unit (data entry/encoding/transmitting/ decoding/displaying) shall not affect the intent of the message.	
SR-12 (ANSP)	C, I	The ATS unit end system shall reject messages not addressed to itself.	
SR-13 (ANSP)	C, I	The ATS unit shall transmit messages to the designated aircraft system.	
SR-14 (ANSP)	A, C, I	The ATS unit system shall indicate to the controller when a required response for a message sent by the ATS unit is not received within the required time (ET_{RCMP}).	
SR-15 (ANSP)	C, I	When the ATS unit receives a message whose timestamp exceeds ET_{RCMP} , the ATS unit shall provide appropriate indication.	

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RCP-related/RSP-related safety requirements			
Specification: RCP 240/D RSP180/D		Application: CPDLC ADS-C	Component: ANSP
Ref:	Related RCP parameter	Safety requirement	Evidence of compliance
SR-16 (ANSP)	C, I	The ATS unit shall prevent the release of clearance without controller action.	
SR-17 (ANSP)	C, I	The ATS unit shall prohibit operational processing by controller of corrupted messages.	
SR-18 (ANSP)	C, I	The ATS unit shall be able to determine the message initiator.	
SR-19 (ANSP)	C, I	The ATS unit shall prohibit the controller from the operational processing of messages not addressed to the ATS unit.	
SR-20 (ANSP)	C, I	The ATS unit shall only establish and maintain data link services when the aircraft identifiers in data link initiation correlates with the ATS unit's corresponding aircraft identifiers in the current flight plan.	
SR-21 (ANSP)	C, I	The aircraft identifiers used for data link initiation correlation by the ATS unit shall be unique and unambiguous (e.g. the aircraft identification and either the registration marking or the aircraft address).	
SR-23 (ANSP)	C, I	An ATS unit system shall not permit data link services when there are non-compatible version numbers.	
SR-24 (ANSP)	C, I	The ATS unit shall respond to messages in their entirety.	
SR-25 (ANSP)	I	The ATS unit end system shall be capable of detecting errors resulting in misdelivery introduced by the communication service.	
SR-26 (ANSP)	I	The ATS unit end system shall be capable of detecting errors resulting in corruption introduced by the communication service.	