RCP monitoring and alerting criteria		
Specification: RCP 240/D	*Application: CPDLC*	*Component: Aircraft operator*
Ref:	*Criteria*	*Means of compliance*
MA-2	When the flight crew determines that the aircraft communication capability no longer meets the requirements for the intended function, the flight crew shall advise the ATS unit concerned.	Procedures, flight crew training and qualification.

RCP-related safety requirements			
Specification: RCP 240/D		*Application: CPDLC*	*Component: Aircraft operator*
Ref:	*Related RCP parameter*	*Safety requirement*	
SR-22 (Operator)	C, I	The flight crew shall perform the initiation data link procedure with any change of the flight identifier.	
SR-24 (Operator)	C, I	The flight crew shall respond to a message in its entirety, when not responded to by the aircraft system.	
SR-27 (Operator)	C, I	The aircraft and/or flight crew shall ensure the correct transfer into or out of the aircraft's FMS of route data received/sent via data link, to be used to define the active flight plan.	

3. RCP 400 SPECIFICATION

RCP specification			
RCP specification	*RCP 400*		
Airspace specific considerations			
Interoperability	Specify interoperability criteria (e.g. FANS 1/A, SATVOICE Iridium, Inmarsat, and/or MTSAT communications).		
ATM operation	Specify ATM operation(s) (e.g. applicable separation standard), if necessary.		
Application	Specify controller-pilot ATC communication intervention capability (e.g. CPDLC, SATVOICE communications).		
RCP parameter values			
Transaction time (sec)	Continuity (C)	Availability (A)	Integrity (I)
ET = 400	C(ET) = 0.999	0.999	Malfunction = 10^{-5} per flight

TT = 350	C(TT) = 0.95		hour
RCP monitoring and alerting criteria			
Ref:	*Criteria*		
CMA-1	The system shall be capable of detecting failures and configuration changes causing the communication service to no longer meet the RCP specification for the intended function.		
CMA-2	When the communication service can no longer meet the RCP specification for the intended function, the flight crew and/or the controller shall take appropriate action.		
Notes			
Note 1.— Rationale for the criteria provided in this specification can be found in Annex 11, Doc 4444, Doc 9689, and RTCA DO-306/EUROCAE ED-122. *Note 2.— The values for transaction times are to be applied to transactions that are representative of communications capability, for the controller to intervene with a specific operator, aircraft type, and aircraft identification.* *Note 3.— 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.*			

3.1 RCP 400/D allocations

3.1.1 *General*

3.1.1.1 The RCP 400/D allocations are applicable to the controller intervention capability via CPDLC. Figure B-2 provides the RCP 400/D allocations associated with transaction time and continuity. The time taken for the controller to issue the instruction and receive the response is shown by analysis. Actual communication performance (ACP) is monitored from C to X. The remaining allocations support initial compliance and problem investigation when ACP does not meet the specified criteria.

3.1.1.2 The RCP 400/D allocations are shared by the ANSP, the CSP, the aircraft system and the aircraft operator. The descriptions and assignments for these allocations, as shown in Figure B-2, are identical to the descriptions and assignments for the RCP 240/D allocations provided in Table B-1.

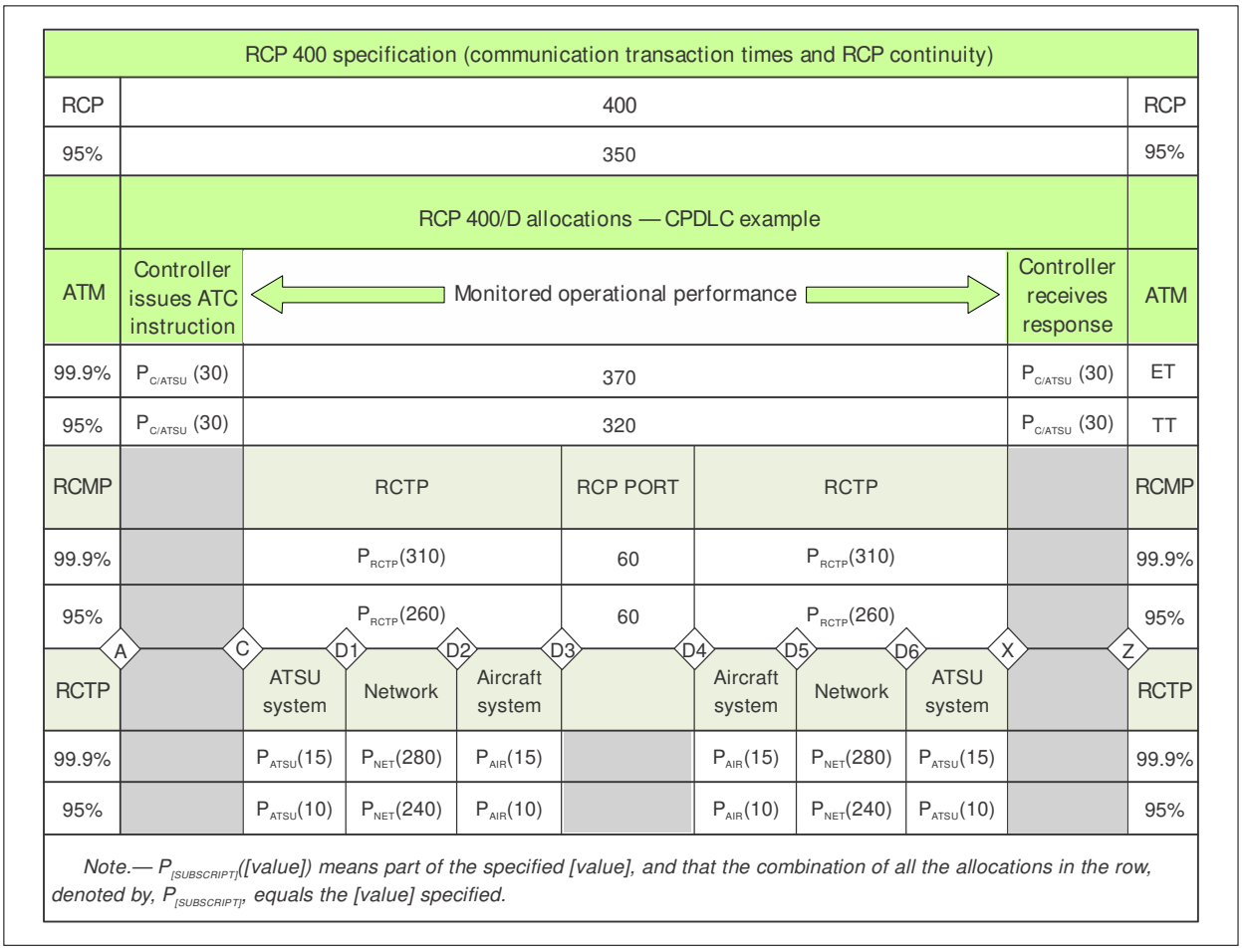

Figure B-2. RCP 400/D allocations — communication transaction times and continuity

3.1.2 *Air navigation services provider (ANSP)*

RCP transaction time and continuity criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: ANSP*
Transaction time parameter	*ET (sec)* *C = 99.9%*	*TT (sec)* *C = 95%*	*Means of compliance*
Transaction time value (A to Z)	400	350	Analysis, monitored.
RCP time allocations			
Initiator (controller/ATSU system) (A to C) + (X to Z)	30	30	Analysis, simulations, safety and human factors assessments.

RCP transaction time and continuity criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: ANSP*
Transaction time parameter	*ET (sec)* *C = 99.9%*	*TT (sec)* *C = 95%*	*Means of compliance*
RCMP (C to X)	370	320	Monitored.
RCMP time allocations			
RCTP (C to D3) + (D4 to X)	310	260	Monitored.
RCTP time allocations			
$RCTP_{ATSU}$ (C to D1) + (D6 to X)	15	10	Pre-implementation demonstration.
$RCTP_{CSP}$ (D1 to D2) + (D5 to D6)	280	240	CSP contract/service agreement. See also 3.1.3 of this appendix.

RCP availability criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: ANSP*
Availability parameter	*Efficiency*	*Safety*	*Means of compliance*
Availability — service ($A_{SERVICE}$)	N/A	0.999	Contract/service agreement terms. *Note 1.— For guidelines to aid in the development of the contract/service agreement with the CSP, see 3.1.3 of this appendix, RCP 400/D allocations to CSP for RCP availability criteria.* *Note 2. — The availability criteria are allocated entirely to A_{CSP} and assume that the ATS unit's system is always available.*

RCP integrity criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: ANSP*
Integrity parameter	*Integrity value*	*Means of compliance*
Integrity (I)	*Note.— RCP integrity criteria related to RCP 400/D are identical to those for RCP 240/D. See 2.1.2 of this appendix.*	

RCP monitoring and alerting criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: ANSP*
Ref:	*Criteria*	*Means of compliance*
All	*Note.— RCP monitoring and alerting criteria related to RCP 400/D are identical to those for RCP 240/D. See 2.1.2 of this appendix.*	

RCP-related safety requirements		
Specification: RCP 400/D	*Application: CPDLC*	*Component: ANSP*
Ref:	*Related RCP parameter*	*Safety requirement*
All	A, C, I	*Note.— Safety requirements related to RCP 400/D are identical to those for RCP 240/D. See 2.1.2 of this appendix.*

3.1.3 *Communication services provider (CSP)*

Note.— The RCP allocations for the CSP are intended to aid the ANSP and the aircraft operator in the development of contracts and service agreements.

RCP transaction time and continuity criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: CSP*
Transaction time parameter	*ET (sec)* *C = 99.9%*	*TT (sec)* *C = 95%*	*Means of compliance*
RCTP time allocations			
$RCTP_{CSP}$ (D1 to D2) + (D5 to D6)	280	240	Contract/service agreement terms.

RCP availability criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: CSP*
Availability parameter	*Efficiency*	*Safety*	*Means of compliance*
Availability — CSP (A_{CSP})	N/A	0.999	Contract/service agreement terms.
Unplanned outage duration limit (minutes).	N/A	20	Contract/service agreement terms.
Maximum number of unplanned outages.	N/A	24	Contract/service agreement terms.
Maximum accumulated unplanned outages time (minutes/year).	N/A	520	Contract/service agreement terms.
Unplanned outage notification delay (minutes).	N/A	10	Contract/service agreement terms.

RCP integrity criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: CSP*
Integrity parameter	*Integrity value*	*Means of compliance*
Integrity (I)	*Note.— RCP integrity criteria related to RCP 400/D are identical to those for RCP 240/D. See 2.1.3 of this appendix.*	

3.1.4 *Aircraft system*

RCP transaction time and continuity criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: Aircraft system*
Transaction time parameter	*ET (sec)* *C = 99.9%*	*TT (sec)* *C = 95%*	*Means of compliance*
RCMP time allocations			
Responder (PORT) (D3 to D4)	60	60	Human-machine interface capability, pre-implementation demonstration.
RCTP time allocations			
$RCTP_{AIR}$ (D2 to D3) + (D4 to D5)	15	10	Pre-implementation demonstration.

RCP availability criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: Aircraft system*
Availability parameter	*Efficiency*	*Safety*	*Means of compliance*
Availability — aircraft (A_{AIR})	N/A	0.999	Analysis, architecture, design, pre-implementation demonstration.

RCP integrity criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: Aircraft system*
Integrity parameter	*Integrity value*	*Means of compliance*
Integrity (I)	*Note.— RCP integrity criteria related to RCP 400/D are identical to those for RCP 240/D. See 2.1.4 of this appendix.*	

RCP monitoring and alerting criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: Aircraft system*
Ref:	*Criteria*	*Means of compliance*
All	*Note.— RCP monitoring and alerting criteria related to RCP allocations 400/D are identical to those for RCP 240/D. See 2.1.4 of this appendix.*	

RCP-related safety requirements		
Specification: RCP 400/D	*Application: CPDLC*	*Component: Aircraft system*
Ref:	*Related RCP parameter*	*Safety requirement*
All	A, C, I	*Note.— Safety requirements related to RCP 400/D are identical to those for RCP 240/D. See 2.1.4 of this appendix.*

3.1.5 *Aircraft operator*

RCP transaction time and continuity criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: Aircraft operator*
Transaction time parameter	*ET (sec)* *C = 99.9%*	*TT (sec)* *C = 95%*	*Means of compliance*
RCMP time allocations			
Responder (PORT) (D3 to D4)	60	60	Procedural capability, flight crew training and qualification in accordance with safety requirements.
RCTP time allocations			
$RCTP_{AIR}$ (D2 to D3) + (D4 to D5)	15	10	Aircraft type design approval, maintenance, properly configured user-modifiable software (e.g. owner requirements table).
$RCTP_{CSP}$ (D1 to D2) + (D5 to D6)	280	240	CSP contract/service agreement. See also 3.1.3 of this appendix.

RCP availability criteria			
Specification: RCP 400/D	*Application: CPDLC*		*Component: Aircraft operator*
Availability parameter	*Efficiency*	*Safety*	*Means of compliance*
Availability — aircraft (A_{AIR})	N/A	0.999	Aircraft type design approval, maintenance, properly configured user-modifiable software (e.g. owner requirements table).
Availability — CSP (A_{CSP})	N/A	0.999	Contract/service agreement terms. *Note.— For guidelines to aid in the development of the contract/service agreement with the CSP, see 3.1.3 of this appendix, RCP 400/D allocations to CSP for RCP availability criteria.*

RCP integrity criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: Aircraft operator*
Integrity parameter	*Integrity value*	*Means of compliance*
Integrity (I)	*Note.— RCP integrity criteria related to RCP 400/D are identical to those for RCP 240/D. See 2.1.5 of this appendix.*	

RCP monitoring and alerting criteria		
Specification: RCP 400/D	*Application: CPDLC*	*Component: Aircraft operator*
Ref:	*Criteria*	*Means of compliance*
All	*Note.— RCP monitoring and alerting criteria related to RCP 400/D are identical to those for RCP 240/D. See 2.1.5 of this appendix.*	

RCP-related safety requirements			
Specification: RCP 400/D		*Application: CPDLC*	*Component: Aircraft operator*
Ref:	*Related RCP Parameter*	*Safety requirement*	
All	C, I	*Note.— Safety requirements related to RCP 400/D are identical to those for RCP 240/D. See 2.1.5 of this appendix.*	

3.2 RCP 400/V_{RO} allocations

3.2.1 *General*

3.2.1.1 The RCP 400/V_{RO} allocations are applicable to the controller intervention capability via a radio operator using SATVOICE. Figure B-3 provides these allocations associated with transaction time and continuity. The time taken for the controller to issue the instruction and receive the response is shown by analysis. Actual communication performance (ACP) is monitored from C to X. The remaining allocations support initial compliance and problem investigation when ACP does not meet the specified criteria.

3.2.1.2 RCP 400/V_{RO} allocations are shared by the ANSP, the CSP, the aircraft system and the aircraft operator. The descriptions and assignments for these allocations, as shown in Figure B-3, are provided in Table B-2.

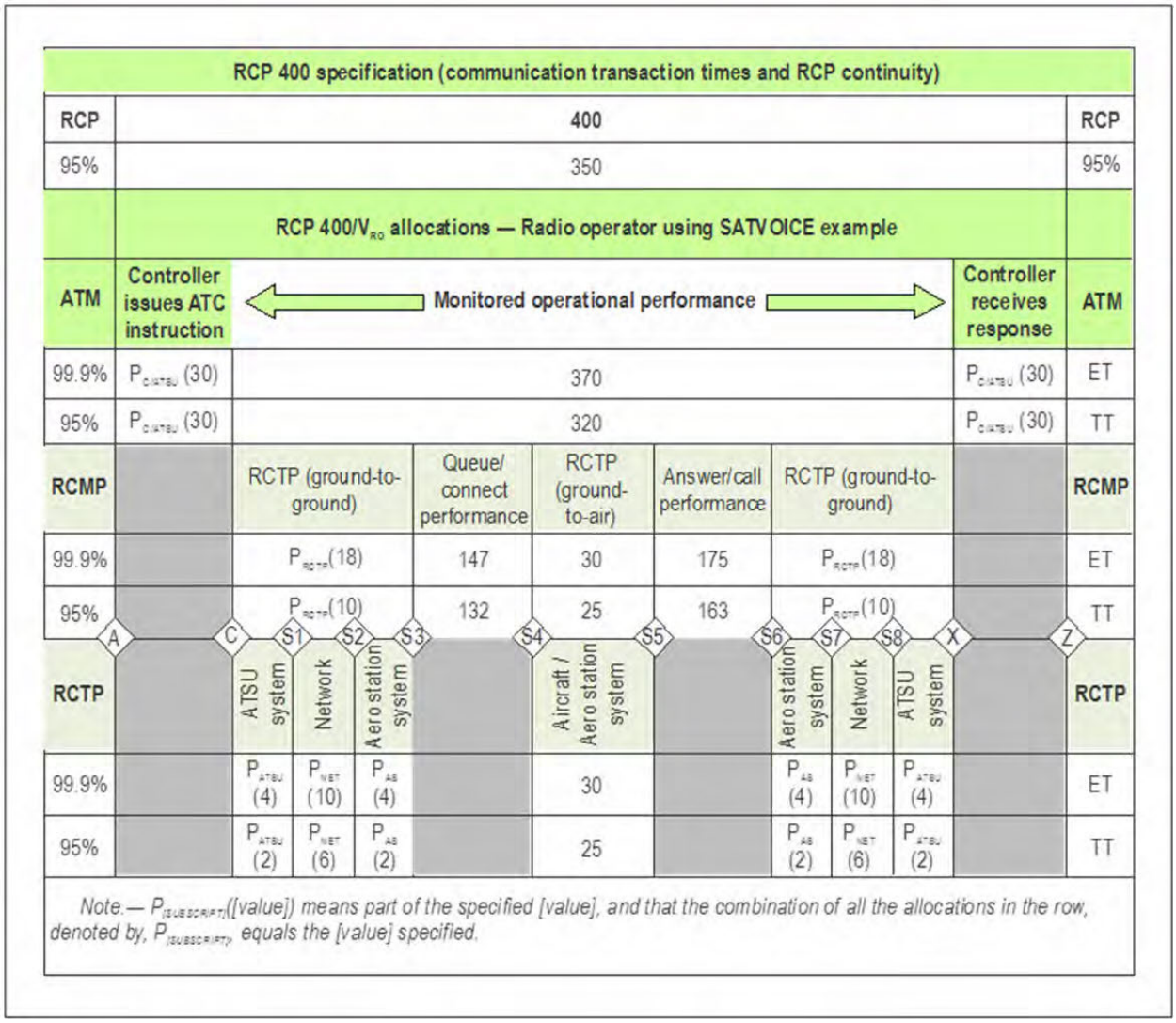

Figure B-3. RCP 400/V_{RO} allocations — communication transaction times and continuity

Table B-2. RCP 400/V_{RO} allocation descriptions and assignments

RCP 400/V_{RO} allocations	*Description*	*ANSP*	*CSP*	*Aircraft*	*Operator*
Controller (initiator performance)	The maximum time allocated to the controller for the issuance of an ATC instruction and receipt of response.	X			
RCMP	The maximum time against which ACP is assessed.	X	X	X	X
Queue/connect performance	The maximum time allocated to the radio operator/aeronautical station system to organize and place the call either via a manual or automated dialling sequence.	X	X		
Answer/call performance (ground-to-air)	The maximum time allocated to when the flight crew receives an indication of an incoming call to when the parties on the call have completed the communication. *Note.— The call is complete when the radio operator sends the flight crew response to the ATS unit.*	X	X	X	X
RCTP	The maximum technical time allocated to relevant parts of the ATS unit's system, aeronautical station's system, the network systems and the aircraft system, for which there is no human contribution to the communication transaction performance.	X	X	X	X
RCTP (ground-to-air) ($RCTP_{G/A}$)	The maximum portion of RCTP allocated to the ground system, network system and aircraft system to set up a ground-to-air call, as determined from when the last digit of the dialling sequence is finished to when the aircraft indicates an incoming call to the flight crew.		X	X	
RCTP (ground-to-ground)	The maximum portion of RCTP allocated to the ground-to-ground network.	X	X		
ATSU system ($RCTP_{ATSU}$)	The maximum portion of RCTP allocated to the ATS unit's system.	X			
Network ($RCTP_{CSP}$)	The maximum portion of RCTP allocated to the CSP.	X	X		X
Aero station system ($RCTP_{AS}$)	The maximum portion of RCTP allocated to the aeronautical station's system for ground-ground communications with an ATS unit. *Note.— $RCTP_{AS}$ includes two concurrent processes:* *a) the aircraft and aeronautical station technically disconnect the call, which is assumed. Operationally, the call is disconnected when the flight crew and radio operator complete the call; and* *b) the aeronautical station sends the response to the ATS unit via the ground-ground network; the performance is denoted by $RCTP_{AS}$.*	X	X		