

PBCS for EUR Region In Support of ICAO-PBCS Workshop 20-22 Feb13

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Overview

ED120/DO290 Performance Specs

EC Regulation 20/2009

Compliance Determination

RCP Specification in EUR?

ED120/DO290 – Performance Specs

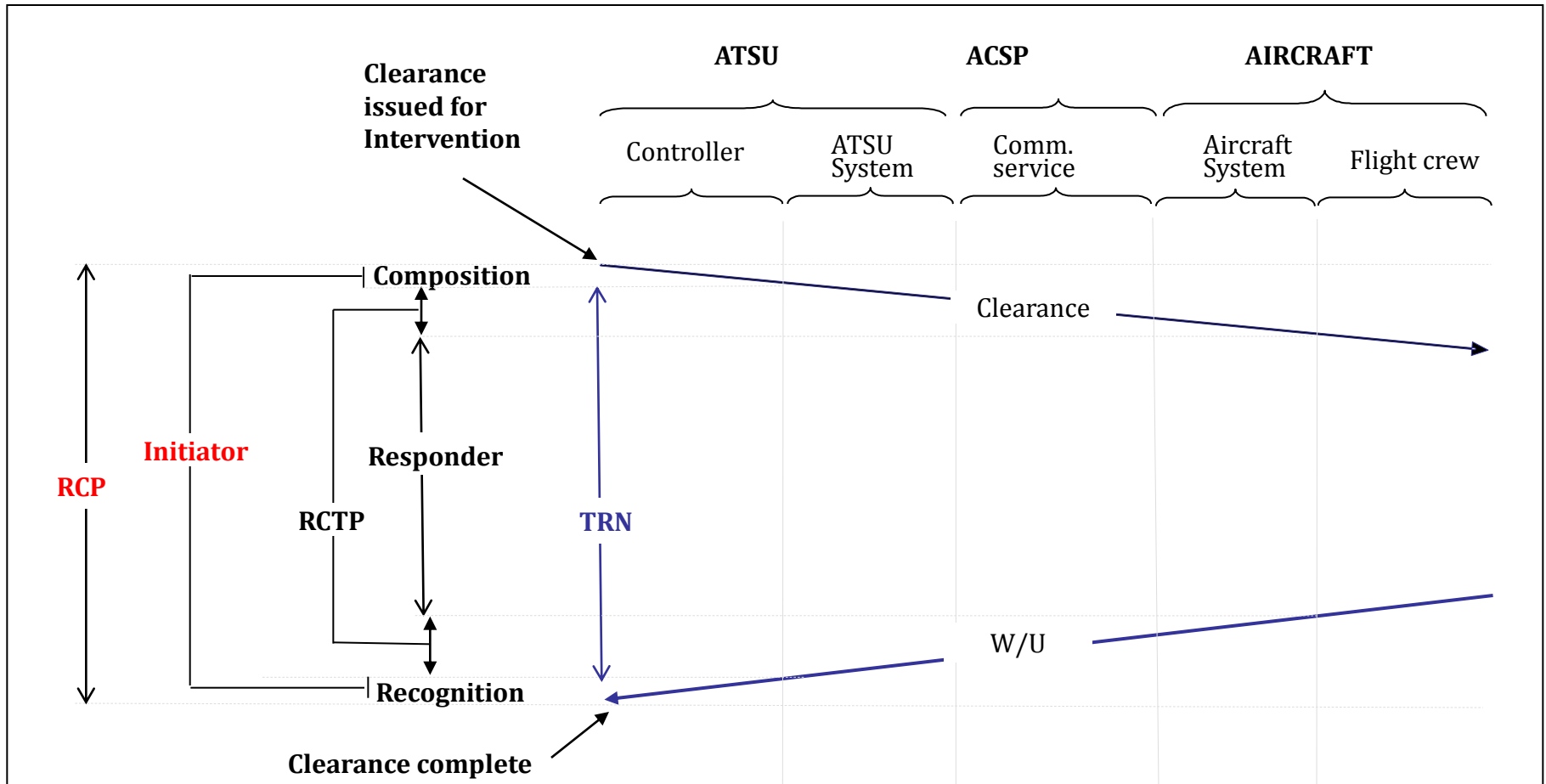


SAFETY AND PERFORMANCE REQUIREMENTS STANDARD FOR AIR TRAFFIC DATA LINK SERVICES IN CONTINENTAL AIRSPACE (CONTINENTAL SPR STANDARD)

- ICAO RCP Concept
 - **Less mature 2000 -2004 Timeframe**
- TIME (INITIATOR) and RCP-value
 - To be specified by each State/Region
- Time, Continuity, Availability, Integrity
TRN based
 - Pseudo E-t-E Transaction
 - For monitoring purposes

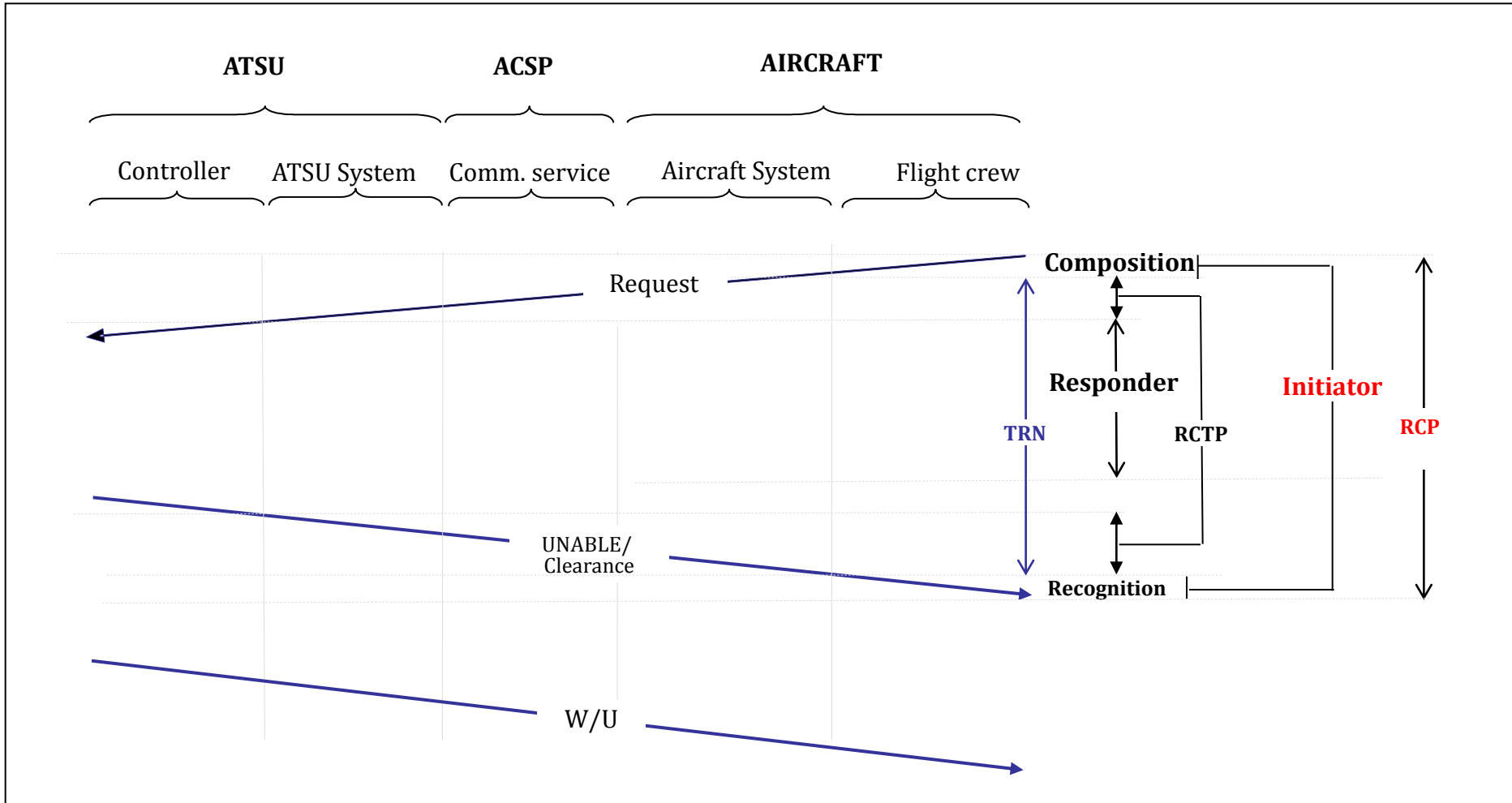
ED-120
May 2004

CPDLC Transaction – Controller Initiated



RCP, Initiator: To be specified by each State/Region

CPDLC Transaction – Flight crew Initiated



RCP, Initiator: To be specified by each State/Region

ED120/DO290 – Performance Specs TRN - based

Parameter	Expiration Time (ET)	Transaction Time (95%)	Continuity ET (/FH)	Availability (Use)	Availability (Provision)	Integrity (/FH)
DLIC initiation	60	30	0.99	0.993	0.999	10 ⁻⁵
DLIC Contact	120	60	0.99	0.993	0.999	10 ⁻⁵
CPDLC						
ACM	120	60	0.99	0.993	0.999	10 ⁻⁵
ACL (FC Initiated)	270	60	0.99	0.993	0.999	10 ⁻⁵
ACL (ATCO Initiated)	120	60	0.99	0.993	0.999	10 ⁻⁵
AMC					0.999	10 ⁻³

Continuity = 0.999 per transaction
Integrity = 1E-6 per transaction
Availability = Driven by efficiency

ED120/DO290 - RCP Allocations (1)

ACM and ACL(Controller-initiated)

Parameter	ET	TT(95)	Continuity (ET)	A(Use)	A(Provision)	Integrity
Source	O	O	QOPL _{UIT}	QOPL _{LOCP}	QOPL _{LOS}	QSPL _{UCT}
RCP _{ER}	<u>Note 1</u>	<u>Note 1</u>	0.99	0.993	0.999	10 ⁻⁵
RCP Allocations						
Initiator	<u>Note 1</u>	<u>Note 1</u>				
TRN _{ER}	120	60	0.99	0.993	0.999	10 ⁻⁵
TRN Allocations						
Responder _{ER}	100	44	0.995			
RCTP	20	16	0.995	0.993	0.999	10 ⁻⁵
RCTP Allocations						
ATSP <u>Note2</u>	14	12				
Aircraft	6	4				
Notes						
Note 1: Values to be specified by each State						
Note 2: ATSP = Combined ATSU and CSP						

ED120/DO290 - RCP Allocations (2)

ACL(Flight crew-initiated)

Parameter	ET	TT(95)	Continuity (ET)	A(Use)	A(Provision)	Integrity
Source	O	O	QOPL _{UIT}	QOPL _{LOCP}	QOPL _{LOS}	QSPL _{UCT}
RCP _{ER}	Note 1	Note 1	0.99	0.993	0.999	10 ⁻⁵
RCP Allocations						
Initiator	Note 1	Note 1				
TRN _{ER}	270	60	0.99	0.993	0.999	10 ⁻⁵
TRN Allocations						
Responder _{ER}	250	44	0.995			
RCTP	20	16	0.995	0.993	0.999	10 ⁻⁵
RCTP Allocations						
ATSP Note2	14	12				
Aircraft	6	4				
Notes						
Note 1: Values to be specified by each State Note 2: ATSP = Combined ATSU and CSP						

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EC Regulation No 29/2009

EC Regulation 29/2009
Laying down Requirements
on DL Services for
Continental EUR Airspace

Operational/Safety/Performance Requirements shall comply with ED120/DO290 + Change 1, 2

**Interoperability based on ICAO/ATN B1
A/G Comm medium based on VDLM2**

Accommodation FANS aircraft, driven by local business case. Other A/G Comm medium permitted, provided no impact on Interop

ATS providers shall monitor the QoS of comms services and verify their conformance with the level of performance required for the operational ENV

Use of CPDLC in EUR

Provision of CPDLC services above FL285.
(FL285 aims to govern data link equipage)
Several ANSPs use CPDLC in their upper airspace below FL285
Subset of ICAO msg set is used; Harmonised across EUR

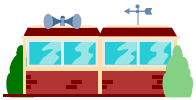
CPDLC is used at the discretion of each responsible ACC and at the initiative of the flight crew.

CPDLC is used for routine exchanges during en-route operations in the upper airspace and is not for time-critical situations.

Communication exchanges by voice have priority over CPDLC exchanges

Benefits of CPDLC in EUR

Benefits:



1. Increase of Airspace Capacity

11% for 75% DL equipage

2. Increase of Safety levels

Reduction of voice channel congestion

Decrease in communication errors

Decrease in communication workload



Increase of Safety levels

Reduction of voice channel congestion

Decrease in communication errors

Decrease in communication workload

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Compliance Determination

**Safe and performant CPDLC is a must.
Complying with the Perf Spec is a shared responsibility!**

Initial Compliance Determination

ANSP - ATS provision
Aircraft/avionics manufacturer - system design
Aircraft Operator - operations and maintenance

Continued Compliance Determination

For ANSPs:

Post-implementation monitoring of actual performance

- 1) Assess of variability and stability to maintain operations
- 2) Analyse status of CPDLC deployment
- 3) Perform corrective action, as appropriate

For CSPs:

Post-implementation monitoring of VDLM2 performance

- 1) Freq capacity planning
- 2) Problem Investigation

More details: FRI 22 Feb

Initial Compliance Determination

ANSP – ATS Provision

- Upgrade system, Recording (ED-111);
- Perform Safety Case (iaw local SMS) showing compliance to the NSA;
(Requirements in ATC Design/Procs; Agreements with CSP; CM/CPDLC INTEROP testing; Training; AIP/AIC notification, Problem reporting mechanism)

Aircraft/Avionics Manufacturer

- Obtain Certificate of airworthiness, showing compliance to the Regulation;
- Perform CM/CPDLC Interop testing with representative ANSP

Aircraft Operator

- Demonstrate compliance to NSA;
(FC qualifications, MEL, Maintenance, Agreements with CSP, Problem reporting mechanism)
- Update AC Operating Manual;
- Obtain operational authorization

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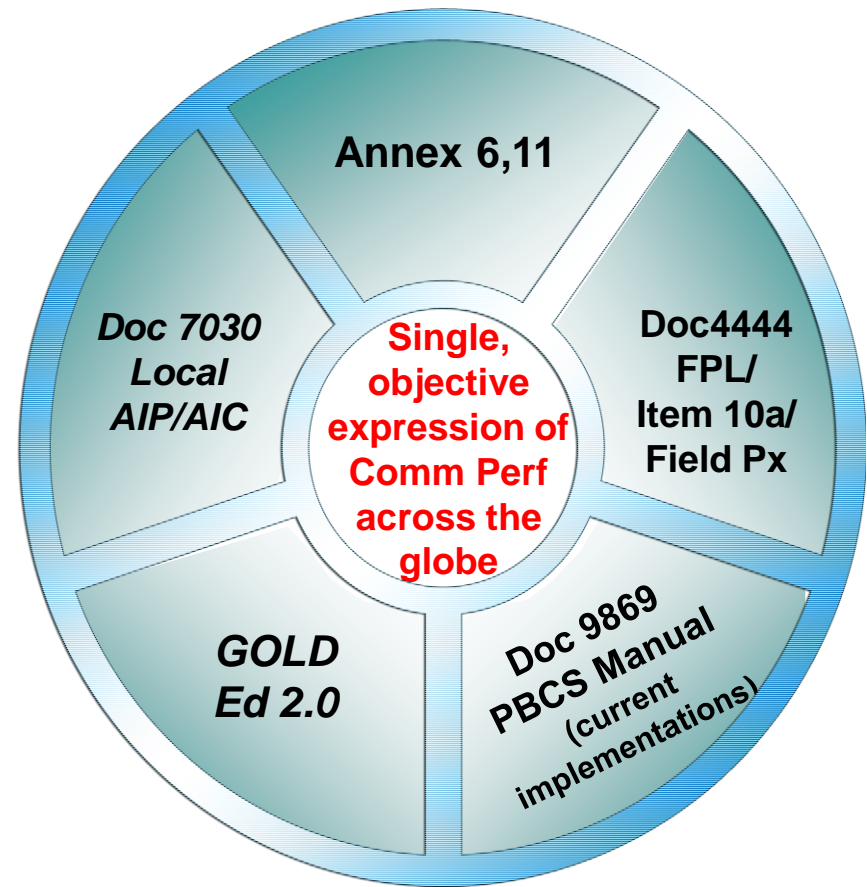
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Proposed RCP values for EUR

RCP150: Controller-initiated messages								
Parameter	INITIATOR Time (ET)	INITIATOR Time (95%)	RCP Expiration Time (ET)	RCP Transaction Time (95%)	Continuity (ET) (/FH)	Availability (Use)	Availability (Provision)	Integrity (/FH)
ACM	30	20	150	80	0.99	0.993	0.999	10 ⁻⁵
ACL	30	20	150	80	0.99	0.993	0.999	10 ⁻⁵

RCP300: Flight crew-initiated messages								
Parameter	INITIATOR Time (ET)	INITIATOR Time (95%)	RCP Expiration Time (ET)	RCP Transaction Time (95%)	Continuity (ET) (/FH)	Availability (Use)	Availability (Provision)	Integrity (/FH)
ACL	30	20	300	80	0.99	0.993	0.999	10 ⁻⁵

Continuity = 0.999 per transaction
Integrity = 1E-6 per transaction
Availability = Driven by efficiency

Need for RCP300 Spec for Requests?

What a controller 'sees' with RCP



Intervention capability	RCP parameter
Means to issue an ATC instruction, when necessary	Availability
Receives timely response to an ATC instruction	Communication transaction time
Delayed responses to ATC instructions are not frequent	Continuity
System and Procs, ensuring flight crew understands and complies with an ATC instruction	Integrity

- Is an RCP for requests needed from flight crew perspective?
 - Performance for Requests can be monitored, independent from RCP300 spec!
- Is it confusing to also mention RCP300 for CPDLC in the FPL?

Questions

