



EASA

European Aviation Safety Agency

ETSO workshop 2018

ETSO-C214

*a further step in incremental certification for
Integrated Modular Avionics*

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Introduction - EASA approach in IMA

- Profit from the return of experience of 2 decades using IMA
 - Use of industry standard ED-124/DO-297
 - Some parts are excluded in EASA system (e.g. Letter of Acceptance ...)
 - Keep flexibility for the worksharing between different industry stakeholders
 - Have an homogeneous continuity between ETSO and Aircraft installation
- 1 Toplevel Rulemaking task



EASA Rulemaking tasks within RMT.0456

➤ ETSO-2C153

Integrated Modular Avionics Platforms & modules

➤ AMC 20-170

Integrated Modular Avionics

➤ ETSO-~~2C516~~C214

Functional ETSO Equipment Using An ETSO-2C153-Authorised IMA Platform Or Module

→ A step forward in incremental IMA approval, for Functional-ETSO equipment

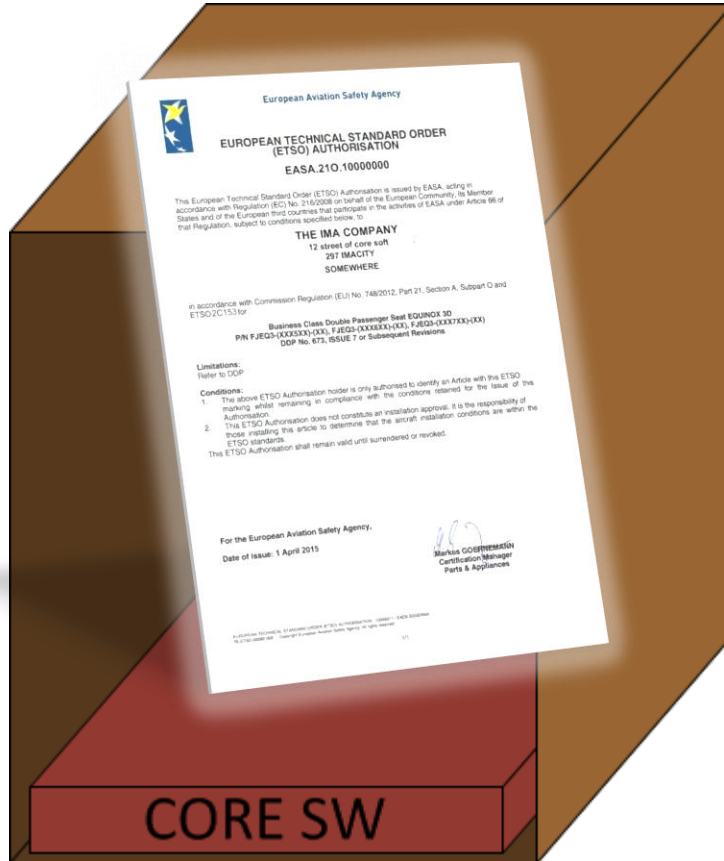


ETSO-2C153

Integrated Modular Avionics Platforms & modules



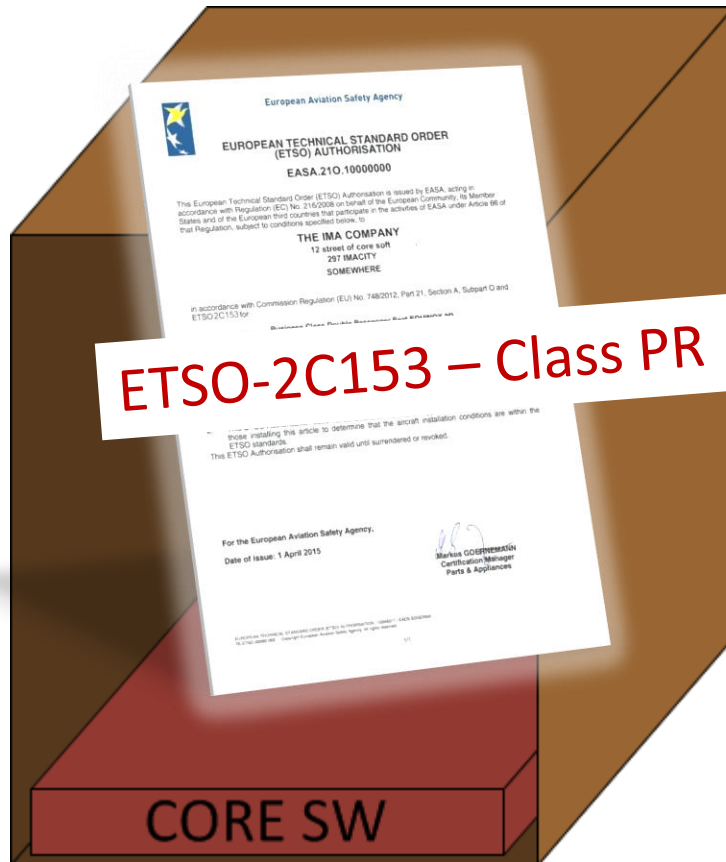
ETSO-2C153 – The MPS



- Applicability of the ETSO standard
 - Module/Platform offering a SHARING function
- ED-124/DO-297 Task1 – Module acceptance
 - Covering ALL components of a module
 - Hardware + Core Software
 - Tools
- Process requirements
- Performance requirements
 - Staying generic... but detailed enough characterization of the performance



IMA Sharing functions = Classes



Class RH

• Rack Housing

Class PR

• Processing

Class GP

• Graphical Processing

Class DS

• Data Storage

Class IF

• Interface

Class PS

• Power Supply

Class DH

• Display Head



ETSO-2C153

- Requires to characterise the platform/modules to the user
- Include partitioning to support multiple Health Monitoring features
- User Data (User Guide) identifying User's constraints/performances

ETSO-2C153 platform/module : A first pillar into IMA development, ETSOA remains an optional path

And similar requirements are laid into AMC 20-170 for IMA platform/module



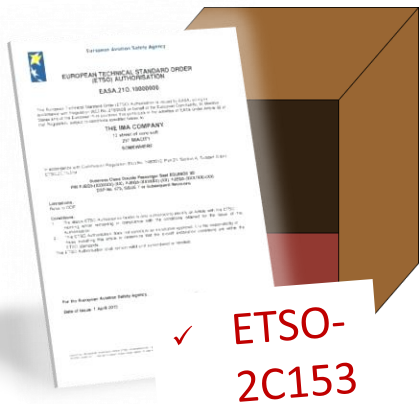
ETSO-C214

Functional ETSO Equipment Using
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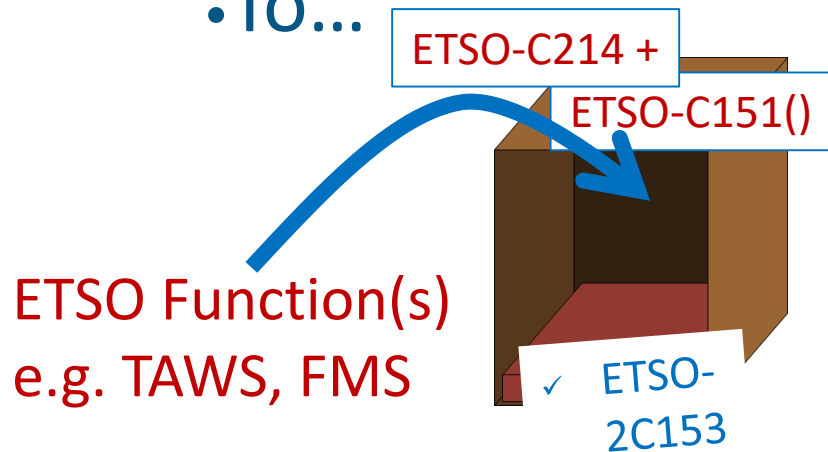


Introduction on ETSO-C214

•From...



•To...

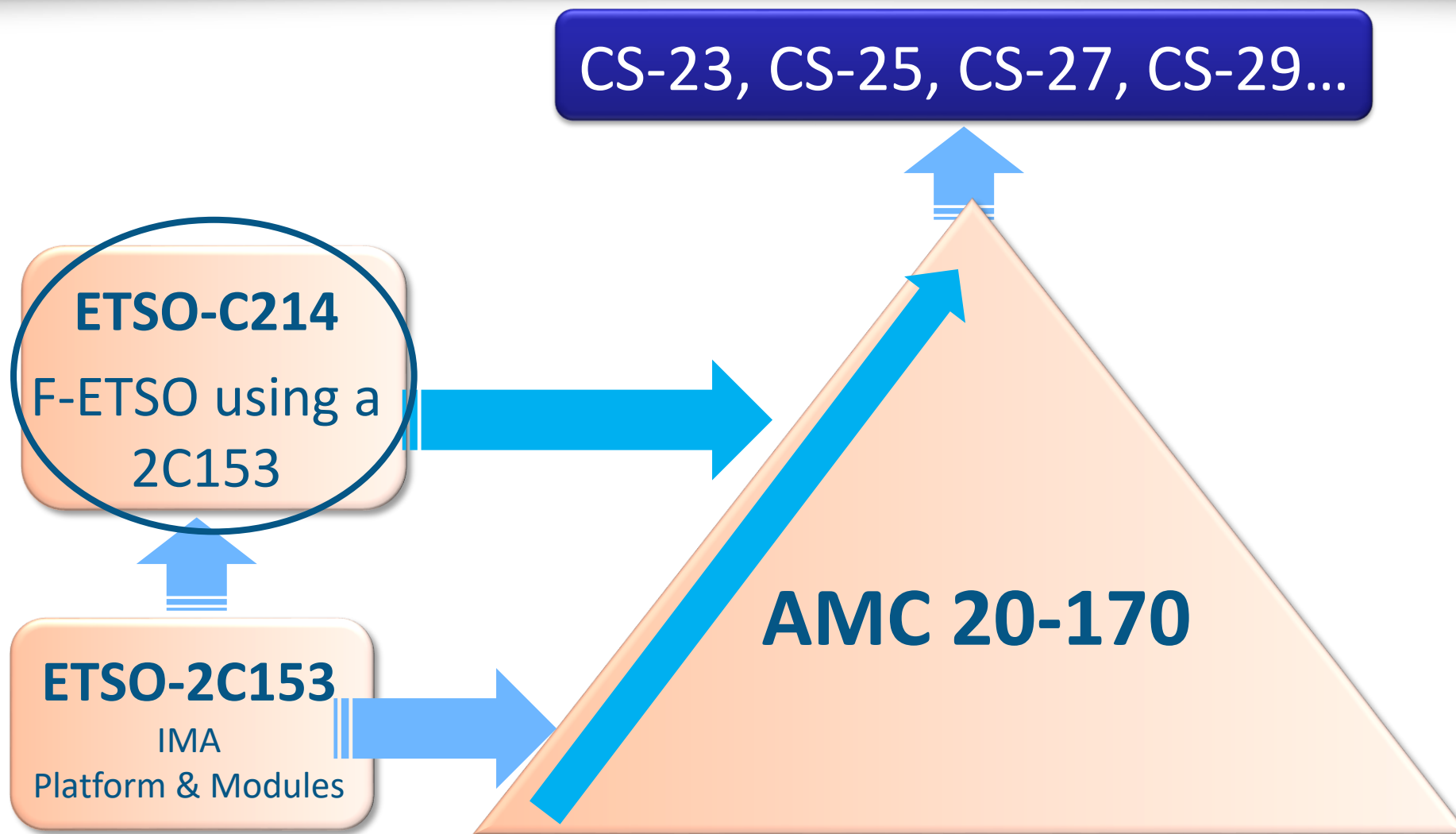


EU Industry expressed

- Interest of an incremental step in approval of IMA systems
- Interest of using credit of ETSO- 2C153 into a « functional » ETSO approval process
 - ETSO-C214 will address « Functional-ETSO equipment using ETSO-2C153 authorized platform/modules»

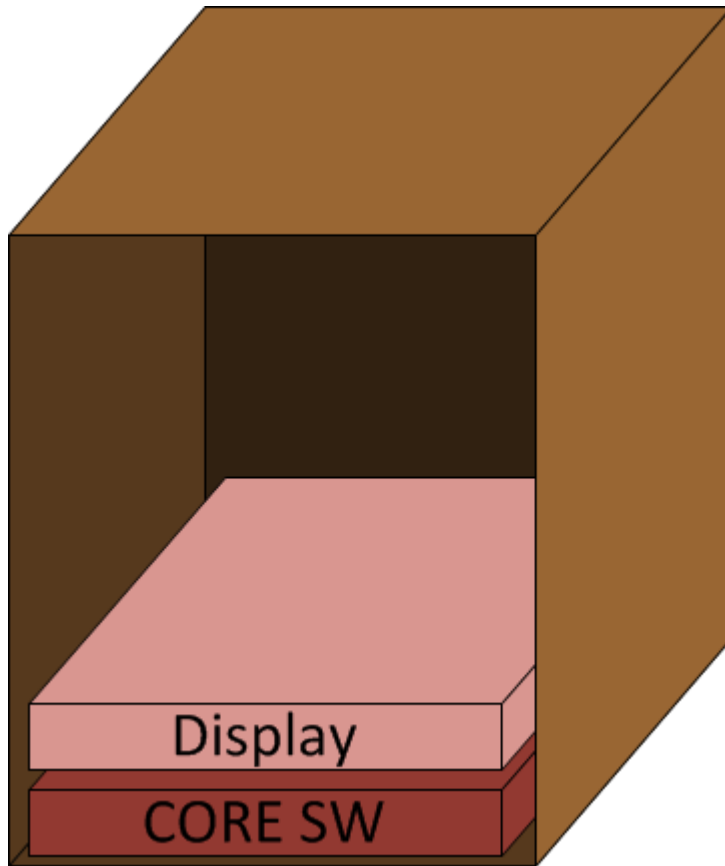


RMT.0456 IMA – incremental acceptance





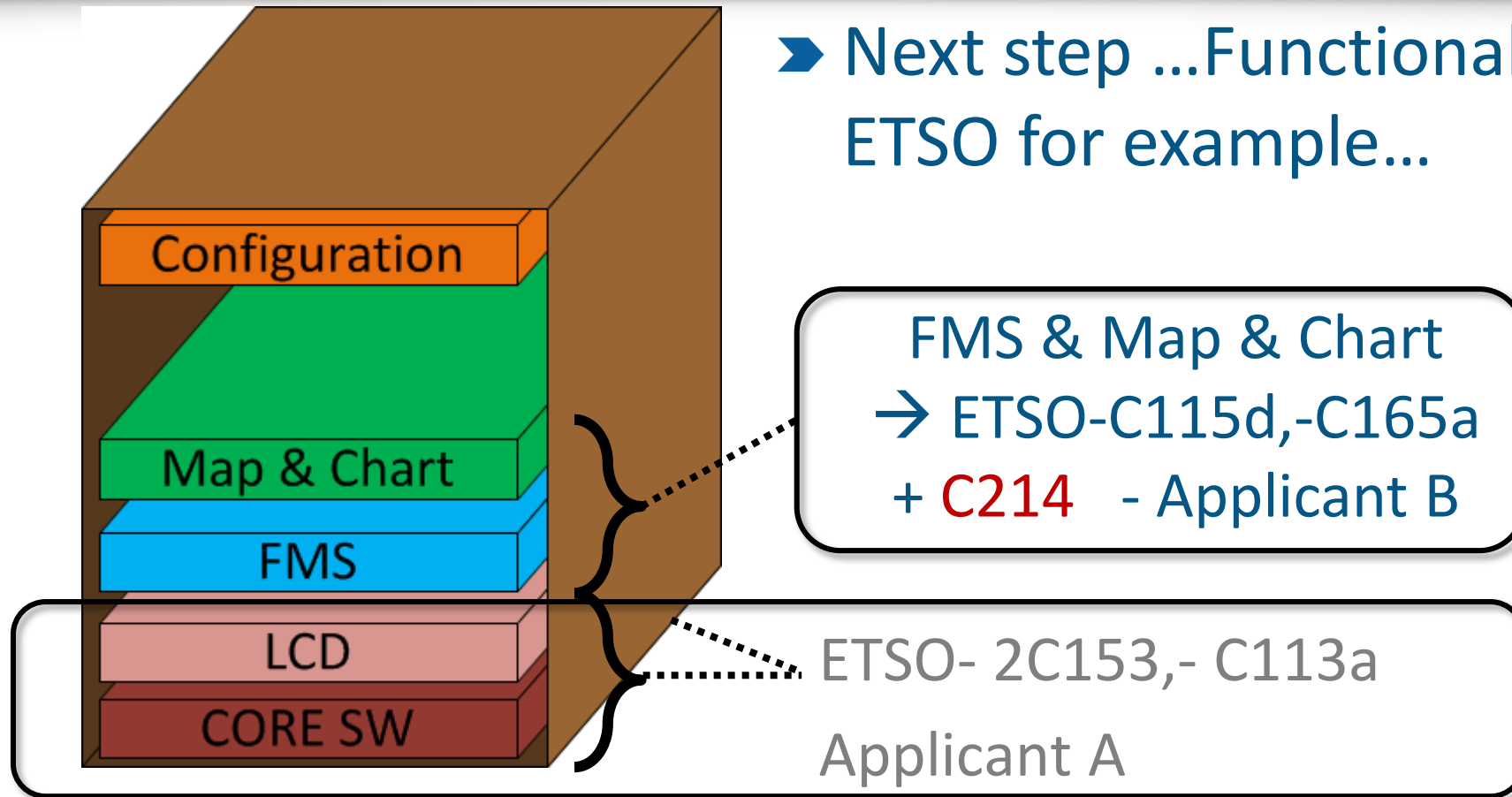
Incremental ETSO proces through examples...



- Example : start from an IMA platform developed with Display, and holding an ETSOA on ETSO-2C153 + ETSO-C113a



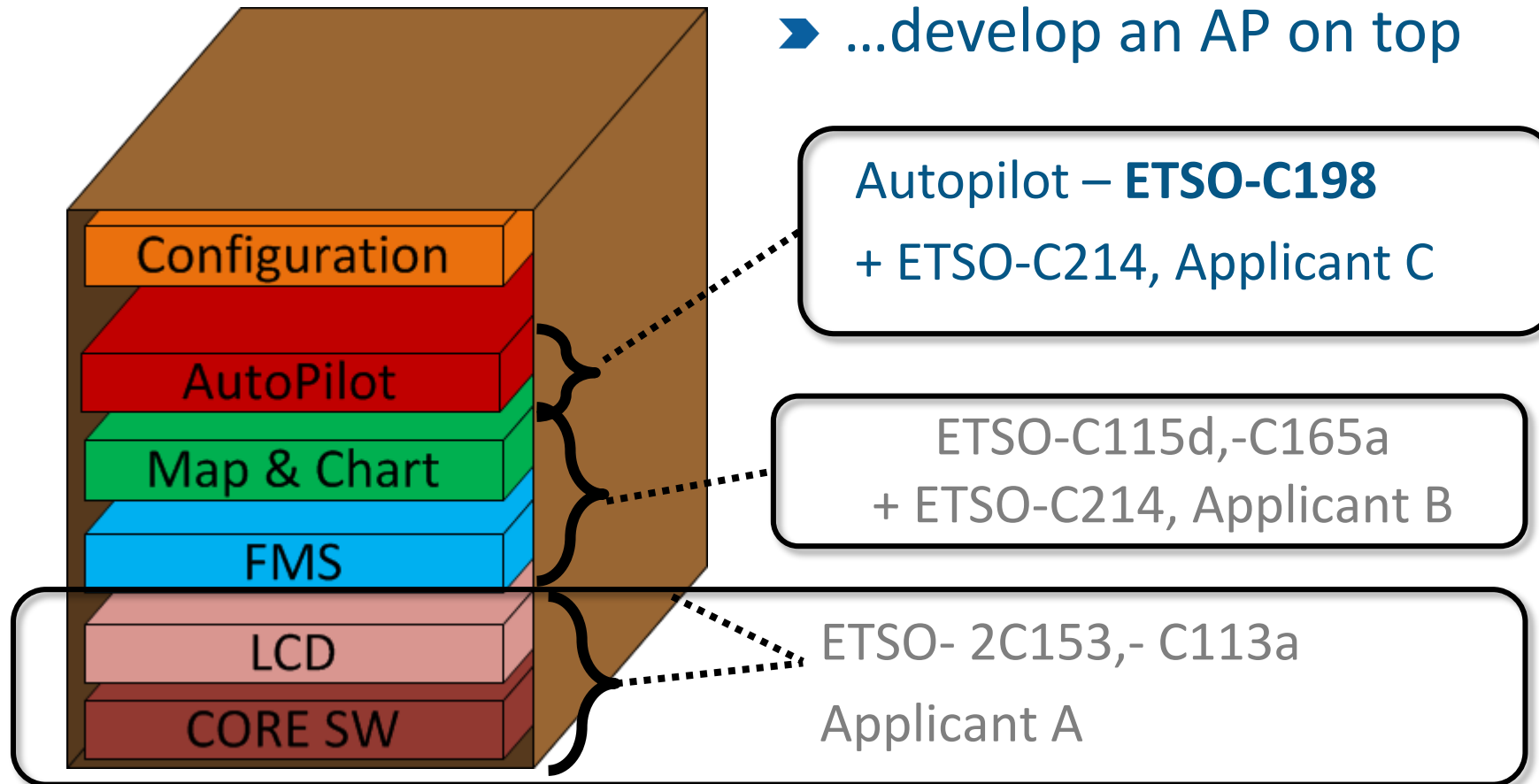
Functional ETSO from ETSO- 2C153...examples



Functional ETSO of the **integrated platform** → ETSO-C214 will describe the 'special' requirements of this 'special' functional ETSO



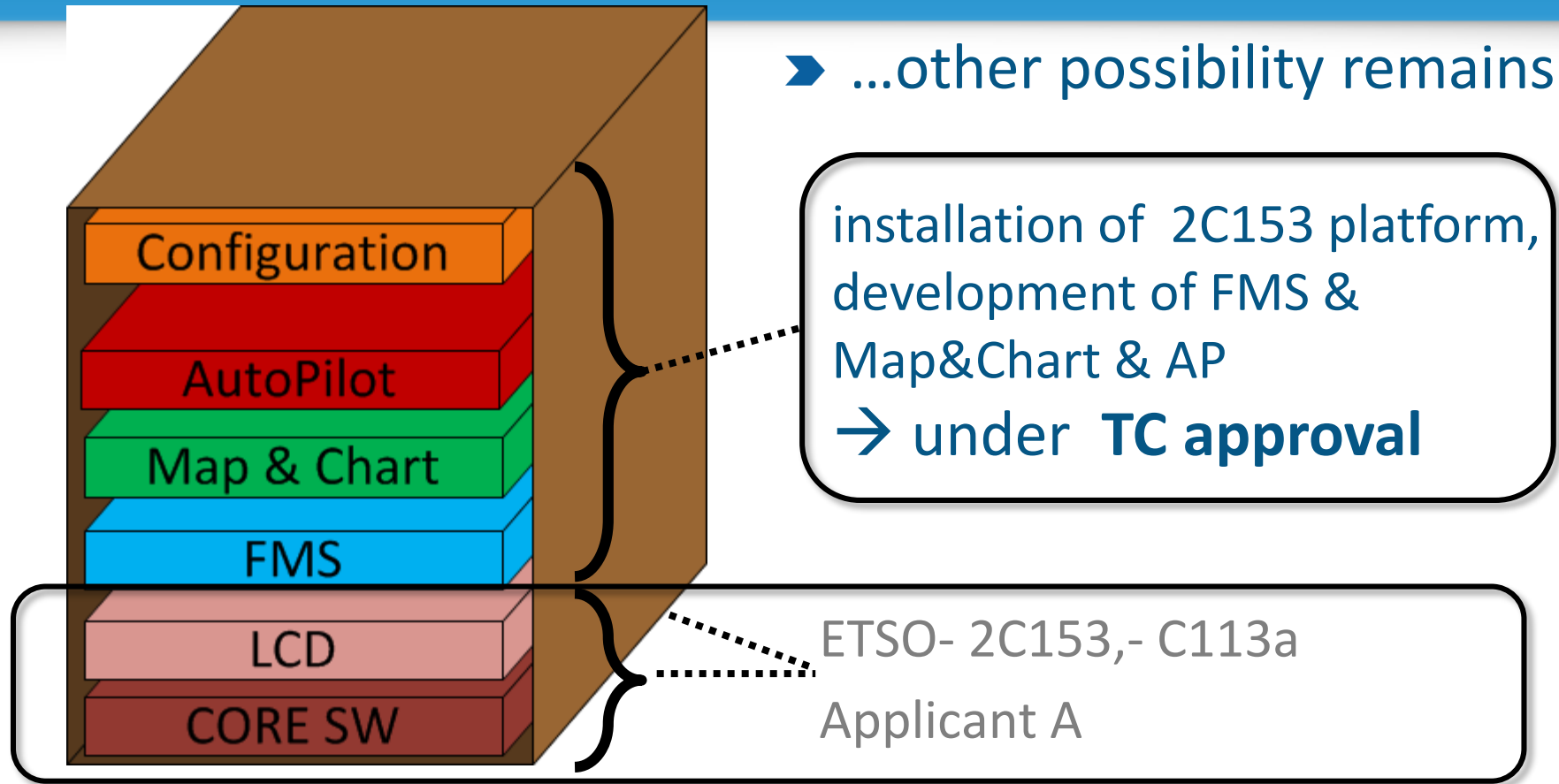
A next step in the example





Aircraft functions

→ assessed + approved at aircraft level



- AMC 20-170 and ETSO-C214 need to be homogeneous, and ensure continuity in the incremental certification process



Application to ETSO-C214

- Applicability
 - ETSO application to 'functional' ETSO standard
 - Using an ETSO-2C153 authorized IMA platform/module
 - applicant seeks certification compliance credit from previous ETSOA on ETSO-2C153
- Application to ETSO-C214 needs to be associated to and application to functional ETSO standard
 - ETSO-C214 MOPS are additional to the ETSO function MOPS
 - ETSO-C214 addresses the development and integration aspects in an IMA context



MOPS & Sections in overview (1/3)

- Proper identification and use of ETSO-2C153 authorized IMA platform/modules
- Equipment/Hardware/Software
 - to cover additional development of aircraft functions
 - ETSO SW & AEH requirements (subpart A) for additional development
 - Task 2 of ED-124/DO-297 for SW applications



MOPS & Sections in overview (2/3)

- Integration activities
 - to cover integration into the equipment of both the IMA platform and the newly developed aircraft function
 - Task 3 of ED-124/DO-297 for applications
 - Considerations for Health Monitoring/Fault Management
 - Tools & Configuration data (refer to AMC 20-170)
- Marking aspects

ETSO-C214 MOPS are in adequation with equivalent flow in a TC certification context (addressed by AMC 20-170)



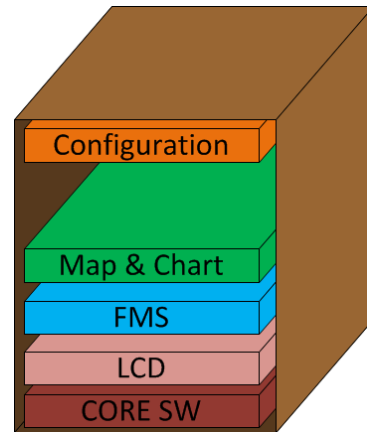
MOPS & Sections in overview (3/3)- Particular procedures

- F-ETSO applicant wants to use an authorized ETSO-2C153 platform from another applicant, therefore particular framework should be set...
 - Access to information
 - all necessary design data as a 'user' of ETSO-2C153 platform
 - Assessment of ETSO-2C153 platform design changes
 - Assessment of Open Problem Reports from the ETSO-2C153 platform



2 classes for ETSO-C214

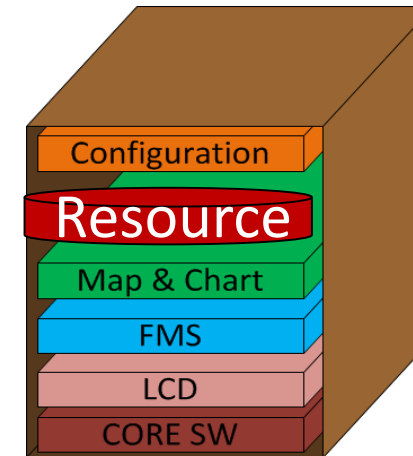
➤ Closed



- The applicant doesn't aim at any further 'IMA development' (no new function/application)

❑ Class is chosen by the applicant

➤ Open



- The applicant is aiming at further 'IMA development', by same applicant or by a user of the F-ETSO'd equipment (new application in another free partition, new function using spare resources)



Additional requirement for class Open

- Appendix 1 describes additional requirement for class Open
 - Need to document the Open platform IMA resources
 - Used and remaining available from ETSO-2C153 platform
 - Any augmented resource should be characterized and documented
 - Future User constraints
- for the purpose of further IMA development



ETSO-C214 – Conclusion

- Concept allows incremental certification, still independent from A/C installation
- CS-ETSO amendment 14 has been published specially for new ETSO-C214 standard, and associated section in subpart A - August 2018
 - Thanks for the constructive comments ! They helped to improve the document
- Harmonization with FAA
 - EASA had regular exchanges with FAA and US industry
 - Review of FAA comments disposition
 - FAA is willing to adopt, therefore the ETSO standard number is in index 1 ('ETSO-Cxxx' series) instead of index 2 ('ETSO-2C5xx' series)"



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Thank you for your attention!

Any questions?

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