Welcome to FPD-Fall 2016
&
Competence Domain #3 : Avionics

TEC-SW/ED Final Presentation Days – Fall 2016

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Welcome to Fall edition of TEC-ED/SW Final Presentation Days

- 2 Days,
- 20 Presentations,
- appx 100 attendees,
- Day-1 agenda:

Tuesday, 6 December 2016

08:00 - 08:30	Registration *30'* Speakers: Kathleen Gerlo (ESA/ESTEC - Software Systems Division), Ms. Bertilla Sinka (ESTEC)
08:30 - 08:45	Introduction *15'*
08:45 - 09:30	Schedulability Analysis Techniques and Tools for Cached and Multicore Processors *45'* Speaker: Mr. Panagiotis Katsaros (CERTH) Material: Abstract
09:30 - 10:15	Definition and Design of software components for LEON3FT Microcontroller and LEON-REX Instruction Set Architecture *45'* Speaker: Mr. Daniel Cederman (Cobham Gaisler AB) Material: Abstract
10:15 - 11:00	OBC Mass Memory (Solid State mass Memory Board/Module Integrated in OBC) *45'* Speakers: Mr. Patrick Sandin (RUAG Space AB), Mr. Dietmar Walter (DSI), Mr. Glenn Johnson (SciSys) Material: Abstract
11:00 - 11:30	Coffee Break
11:30 - 12:15	CLP: Control Loop Processor, Architectural Design, Verification and FPGA prototypes *45'* Speaker: Mr. Marco Ruiz (SABCA) Material: Abstract
12:15 - 13:00	Deploying Plug and Play Avionics *45'* Speaker: Mr. Richard Melvin (SciSys) Material: Abstract
13:00 - 14:00	Lunch Break
14:00 - 14:45	Extensions and Validation of Virtual Platform for complex System-on-Chip and IP Cores Design for Space *45'* Speaker: Mr. Alberto Ferrazzi (Terma) Material: Abstract
14:45 - 15:30	
15:30 - 16:15	DMON and the AGGA 4 *45'* Speaker: Prof. Michael Ryan (O.C.E. Technology) Material: Abstract
16:15 - 16:45	Coffee Break
16:45 - 17:30	LLVM compiler for in flight SW development and validation process *45'* Speaker: Dr. Emil Vassev (LERO) Material: Abstract
17:30 - 18:15	Space Fibre IP core *45'* Speaker: Mr. Felix Siegle (Cobham Gaisler AB)

Competence Domains

- D/TEC, pushed by the need to increase the cooperation among the various elements and layers that compose the ESA technical directorate, aiming to increase the cross-fertilization between TEC and OPS organizational entities and improve the responsiveness to industrial and stakeholders needs, has created the Competence Domains.

- Ten (10) Competence Domains have been created:
  1. EEE / Components / Photonics / MEMS
  2. Structures / Mechanisms / Materials / Thermal,
  3. **Avionics** Architecture / DHS / OnBoard S/W / FDIR / GNC / AOCS / TT&C (E2E)
  4. Electric Architecture / Power & Energy / EMC
  5. End-to-end RF & Optical Systems and Products for Navigation, Communication & Remote Sensing
  6. Life / Physical Science Payloads / Life Support / Robotics and Automation
  7. Propulsion, Space Transportation and Re-entry Vehicles
  8. Ground Data Systems / Mission Operations
  9. Information Technology and data fusion and analytics
  10. Astrodynamics / Space Debris / Space Environment

Systems Engineering, tools and PA/QA/Safety are transversal and represented in all CD's.

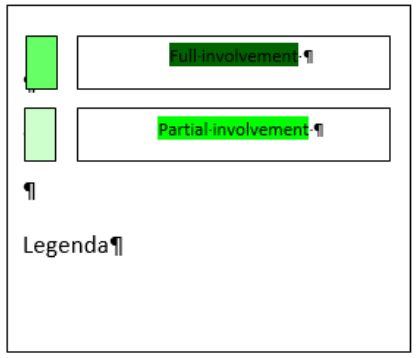
Competence Domains

- Each Competence Domain has a leader and is animated by a group of experts across departments to cover all disciplines of the Competence Domain. S/he is deputised/supported by a colleague from a different Dept.

- The Competence Domain Lead(er) of CD#3 is Jean-Loup Terraillon (TEC-S). TEC-EDD GM is the deputy. Mandate of 2+1 years

- The Competence Domain includes Systems Engineers and a PA expert.

- The Competence Domain does not replace the structure/organigramme of D/TEC composed by sections/divisions/departments/offices but supports it with the main task to improve cooperation and responsiveness.



			Technology Domains																								
			Nr	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			Title	O/B Data Systems	Space System Software	Spacecraft Power	Spacecraft Environment & Effects	Space System Control	RF Payload Systems	Electromagnetics Technology	System Design & Verification	Mission operation and Ground Data Systems	Flight Dynamics and GNSS	Space Debris	Ground Station Systems and Networks	Automation, Telepresence & Robotics	Life & Physical Sciences Instrumentation	Mechanisms	Optics	Opto-Electronics	Aerothermodynamics	Propulsion	Structures & Pyrotechnics	Thermal	ECLS and ISRU	Components	Materials & Processes	Quality, Dependability and Safety
			Lead	Ph Armbruster	JL Terraillon / N Peccia / PG Marchetti	H Barde	E. Daly / V. Ferlet	A. Benoit	R De Gaudenzi	C. Mangenot	J. Fuchs / B. Laine	N. Peccia	W. Enderle	H. Krag	KJ Schulz	G. Visentin	R. Lindner	L. Gaillard	L. Maresi	Z. Sodnik	J. Longo	G Saccoccia	J Santiago Prowald	O. Pin	C. Lasseur	R. de Marino + L. Marchand	M. Nikulainen	L. Bianchi
Competence Domains																											
Nr	Title	Lead																									
01	EEE / Components / photonics/MEMS	L. Marchand / K. Minoglou		X					X											X						X		
02	Structures, mechanisms, materials, thermal	O. Pin / T.Ghidini																X					X	X			X	
03	Avionic Architecture / DHS / OnBoard S W / (FDIR) / GNC + AOCS / TT&C (E2E)	JL Terraillon / G. Magistrati		X	X			X	X														X	X				
04	Electric Architecture / power and energy - / EMC /	F. Tonicello / J.Wolf			X	X				X								X						X				
05	End to end RF & Optical systems and products for navigation, communication and remote sensing	R. de Gaudenzi / L.Maresi							X				X		X				X	X								
06	Life / Physical Science Payloads / Life Support / Robotics and Automation	R. Lindner / G. Visentin														X	X							X	X			
07	Propulsion, space transportation and re entry vehicles	G. Saccoccia / S. Bennani						X													X	X	X	X				
08	Ground data systems / mission operations	N. Peccia / K.L.Schultz										X			X													
09	Information Technology and Data fusion & analytics	R. Franco / B. Laine									X	X																
10	Astrodynamics / Space Debris / Space environment	W.Enderle / H.Krag					X						X	X														

System Engineering, tools (including modeling and simulation) and PA/QA/Safety are transversal and represented in all CDs

Perimeter

Avionics systems
architecture, communication (incl. CFDP), autonomy, fdir, operability, security, o/b gnss receiver, development-verification-validation processes

Data systems
data processing, data management, payload/platform computers, data storage, on-board networks, microelectronics (ASICs, FPGAs, IP cores)

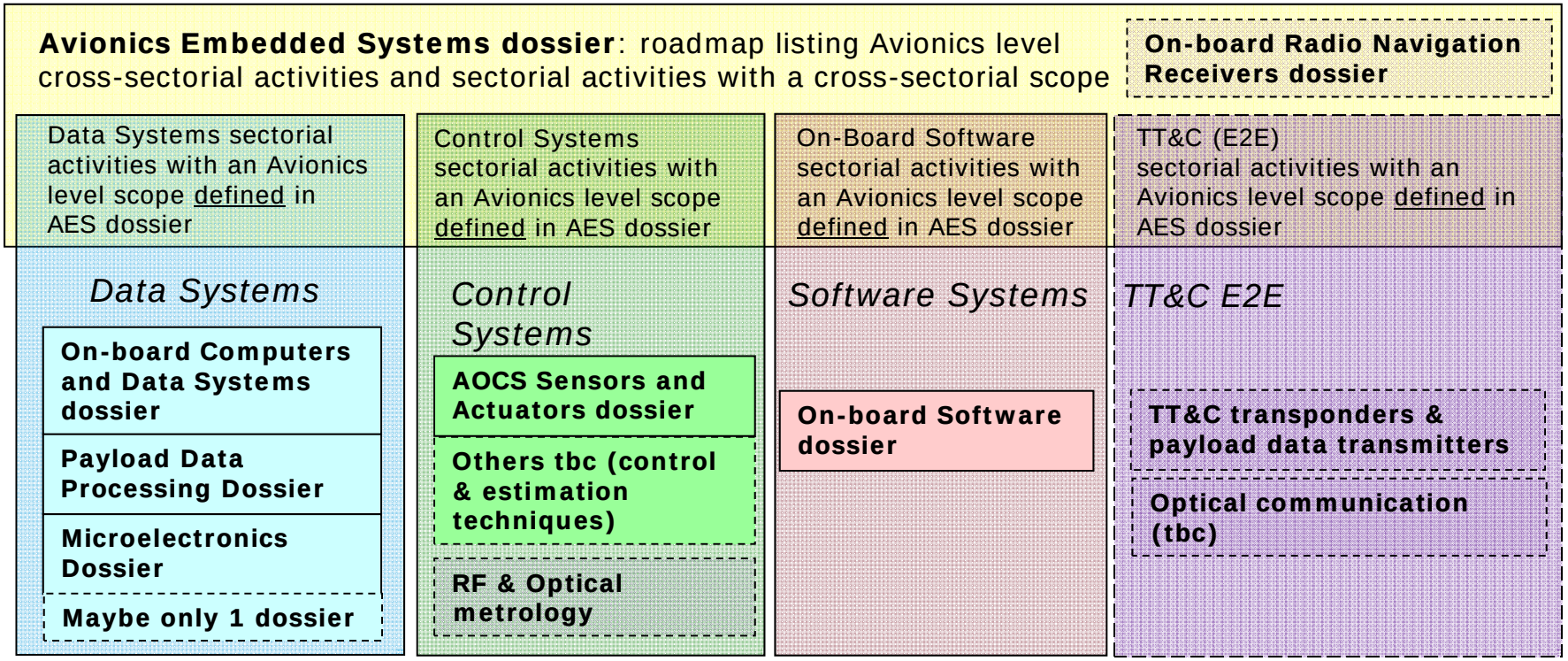
CD03

TT&C E2E systems
space communication architecture, payload data modulator, transponder

Control systems
aocs & pointing, gnc, enabling technologies, control techniques, Sensors, RF and optical metrology

Software systems
flight software, software quality, dependability

Avionics and Harmonisation: possible future status



Roadmaps

Related Harmo Roadmap	Past Revisit	Planned Revisit	Remarks
Avionics Embedded Systems	2016.1		
On-Board Payload Data Processing	2016.1		It has been proposed to combine these 3 roadmaps in a single one for the next revisit. Microelectronics is also a topic of relevance for CD 1.
Data Systems and On Board Computers	2016.1		
Microelectronics - ASIC & FPGA	2016.1		
On-Board Software	2014.2	2019?	
AOCS Sensors and Actuators (Part I & Part II)	2013.1 & 2015.2	2019?	AOCS Sensors and Actuators was split in 2013. Part I covers only Star Trackers, EPS. Gyros, Accelerometers, Reaction Wheels. Part II covers the remaining AOCS: IMUs, MTMs/MTQs, Sun Sensors, Earth Sensors, HNS (Inertial/GNSS), Optical Navigation Sensors, Lidars/3D cameras, CMGs. Topic of relevance also to CD 1 and CD 2.
On-Board Radio Navigation Receivers	2013.2	2019	Topic of relevance also to CD 5.
RF & Optical Metrology	2008.1	2018	In 2008, two separate TDs / RMs sets were issued: “Formation Flying - Optical Metrology Technologies” and “Formation Flight (FF) Radio-Frequency (RF) Metrology”. Topic of relevance also to CD 5.
TT&C Transponders and Payload Data Transmitters	2012.2	2019	

CD#3 tasks

- Animate the CD community with technology events as
  - Workshops,
  - Trainings,
  - internal events.
- R&D coordination:
  - provide a system view as a link between individual R&D activities (TECNET, Harmonization),
  - liaise between different ESA Working Groups,
  - ensure the Work-Plans consistency, seek for synergies,
  - participate in the technology development process while supporting the related divisions in ensuring timely, complete and adequate dissemination of results.

Future Avionics Events

SESP2017
Simulation and EGSE for Space Programmes
28-30 March 2017
ESA-ESTEC
http://esaconferencebureau.com/2017-events/17c01

10th International ESA Conference on Guidance, Navigation & Control Systems
29 May - 2 June 2017, Salzburg, Austria
http://esaconferencebureau.com/2017-events/17a03/introduction

DASIA2017
Data Systems In Aerospace
30 May – 1 June 2017
Gothenburg
www.dasia.org

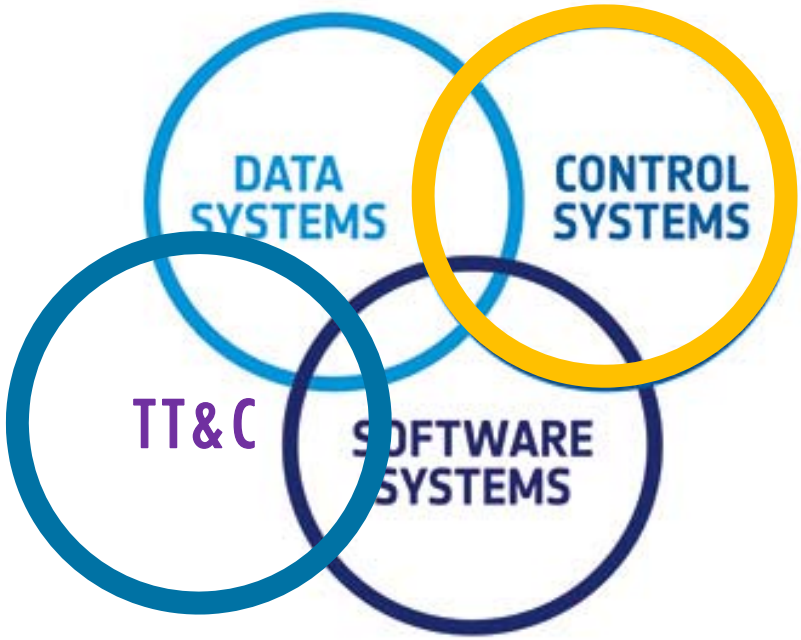
(CD#3) TEC-ED & TEC-SW Final Presentation Days
May/Fall 2017,
ESA-ESTEC

CAN in Space2017 Workshop
14-16 June 2017,
70042 Mola di Bari (BA), Italy
https://indico.esa.int/indico/event/162/

ADCSS2017
Workshop on Avionics, Data, Control and Software Systems
17-19 October 2017
ESA-ESTEC
http://adcss.esa.int

CFPDs 2017
Coordinated Final Presentation Days
Fall 2017,
ESA-ESTEC

Subscription to avionics events:
https://lists.estec.esa.int/lists/



Let’s start !