



EUR. 393-22 / WG72-165  
RTCA Paper No. 320-22/SC216-138

Saint Denis, 17-21 October 2022  
Washington, 17-21 October 2022

**EUROCAE WG-72 Plenary Meeting #68 / RTCA SC-216 Plenary Meeting #59  
“Aeronautical Systems Security”**

<b>Date</b>	<b>17 October 2022</b> <b>5:00am – 12:00pm Eastern</b> <b>1100-1800 Central Europe</b> <b>18-20 October 2022</b> <b>3:30am – 11:30am Eastern</b> <b>930-1730 Central Europe</b> <b>21 October 2022</b> <b>3:00am – 7:00am Eastern</b> <b>900-1300 Central Europe</b>
<b>Place</b>	<b>Virtual Meeting-Webex as well in-person at EUROCAE</b>
<b>Hosted by</b>	<b>EUROCAE</b>

**Attendance:**

	Contact	Organisation	17 <sup>th</sup>	18 <sup>th</sup>	19 <sup>th</sup>	20 <sup>th</sup>	21 <sup>st</sup>
AW	Adrian Waller	Thales	X		X	X	X
AC	Alain Combes	Airbus			X	X	X
	Alain Vallee	EUROCAE	X	X	X	X	X
	Alan Teyssier	FAA				X	
AD	Andrew Drake	NetJets	X	X	X	X	X
AB	Andy Boff	Egis Aviation	X	X	X		X
	Ana Pascua	IATA	X	X	X	X	X
	Angeliki Karakoliou	EASA	X	X	X	X	
AG	Anna Guegan	EUROCAE	X	X	X	X	X
	Anup Rajee	Honeywell	X	X	X	X	X
	Bill Trussell	IFR Development	X	X	X	X	
	Charles Sheehe	NASA	X	X	X	X	
	Claudio H Castro	Lilium	X				
	Christian Haury	SAFRAN					X
CR	Cyrille Rosay	EASA	X	X	X	X	X
	Dan Diessner	FAA				X	
	David Chen	FAA	X				
	David Harvie	ERAU	X	X	X	X	X
DP	David Pierce	GE Aerospace	X				X

	Davide Matini	EASA		X				
	Garv Stephenson	Wisk	X					
	Gilles Descargues	Thales Group	X	X				
	Gyory Blazsovsky	Hungry Control	X					
	Isidore Venetos	FAA	X	X	X	X		
	Hagop Kazarian	Bombardier					X	
	Hannes Alparslan	EDA	X	X	X	X	X	X
	Jakub Cunat	EGIS Group	X	X	X	X	X	X
JPM	Jean Paul Moreaux	EASA		X				
JH	Jerry Hancock	Inmarsat		X	X	X	X	X
	John Flores	FAA	X	X	X	X	X	X
	Jonathon Bailey	Thales Group						X
	Jose Romero-Mariona	RTX	X	X	X	X	X	X
	Kanwal Reen	Collins Aerospace	X	X	X	X	X	X
KH	Karan Hofmann	RTCA	X	X	X	X	X	X
	Klarisa Reyes	RTX						X
	Laurent Leonardon	Collins Aerospace	X	X	X	X	X	X
	M Waheed	Aviage Systems	X	X	X	X		
	Mark Humphreys	Menzies Aviation						X
	Mark Kelley	AVISTA	X	X	X	X	X	X
	Matthieu Willm	Dassault Aviation	X	X	X	X	X	X
	Michael Goodfellow	ICAO		X				
	Mitch Trope	Garmin	X	X	X	X	X	X
	Nicolas Durandean	EASA	X				X	X
	Olga De Frutos Martin	ICAO		X				
PM	Patrick Morrissey	Collins Aerospace	X	X	X	X	X	X
	Philippe Dejean	Safran	X					
	Phillip Watson	Panasonic Avionics	X	X	X	X	X	X
	Renuka Chitikesi	Honeywell	X					
	Rob Segers	FAA		X				
	Rob Stallard	CAA						X
	Rosemberg Silva	ANAC Brazil	X	X	X	X	X	X
SSB	Sarah Stern	Boeing					X	
SM	Sam Masri	Honeywell International	X	X	X	X	X	X
SN	Siobvan Nyikos	Boeing	X	X	X	X	X	X
SS	Stefan Schwindt	GE Aerospace	X	X	X	X	X	X
	Tara Shawde Brown	Southwest Airlines					X	
TK	Ted Kalthoff	NIAR	X	X	X	X	X	X
	Ted Patmore	Delta Airlines	X	X	X	X	X	X
	Thomas Parmer	FAA	X	X	X			
VK	Varun Khanna	FAA	X	X	X	X	X	X
	Will Gonzales	FAA	X	X				
	Xylene Gonzalez-Pelayo	ALPA	X	X				

## **Day 1 – 17 Oct 2022**

### **Introductions**

- PM started out introductions
- A roll call was then conducted of the meeting attendees
- CR presented the agenda and requested revisions or additions and introduced the WG-72 and SC-216 Structures
- PM walked through WG-72/SC-216 Leadership

### **EUROCAE / RTCA Meeting Guidelines and Comments – A. Guegan / K. Hofmann**

- KH went through policy comments
- AG went through EUROCAE IPR
- KH went through RTCA Membership Participation
- AG went through EUROCAE Membership Participation
- AG went through GDPR policy

### **Acceptance of Minutes of September Plenary**

- PM requested input for any objections to the minutes.
- SM said no issues were raised when minutes were sent out.
- None were raised in the meeting and the previous meeting minutes were accepted.

### **Leadership Changes**

- Angeliki Karakoliou is needing to step away temporarily from supporting SG-3
- Nicolas Durandeu will assist SG-3 // DO-ISEM team till AK can return
- Andy Boff needs to step down as secretary for SG-4
- Jakub Cumat was nominated and approved
- Stefan S (SS) will chair SG-4 for EUROCAE
- Siobvan N. (SN) will chair SG-4 for RTCA
- Mark Kelley will be tech editor

### **List of Work Items**

- CR introduced the list of work items to be covered
- PM asked for interest from those in attendance in which documents they would like to participate in
- Heavy interest in all documents, data security (DSEC going forward), ISMS and ISEM update
- Need to have an agenda item to ensure involvement from operators, airports, and ANS by SS
- AG and KH both stated they would reach out to these groups and get their involvement in future discussions
- PM brought up ICAO Working Group "I" that focuses on Data Security
- SS brought up that WG I is ICAO, ARINC, and EUROCAE, Trust Framework is not harmonized through
- CR showed work program schedule, updates should be reachable in 2 years, new documents may be hard to complete in 2 years
- CR showed Distribution of Interest, DSEC is the biggest taker, biggest challenge // Focus the document on certain aspects, not all data security aspects
- CR mentioned that the update for DO-392 for performance metrics, SS mentioned Embry Riddle has research related to this, Bill Trussell mentioned that some of his colleagues will present on Thursday
- CR showed the task sheet for ED/DO-XXX will be changed to ED/DO-ISMS
- CR, SN there will be a safety presentation on Tuesday related to this task
- SS there will also be some folks from ICAO talking about what is happening on the ICAO level and how this new document will fit in with their new work

- CR started presenting info related to new MOPS document
- KH and AG need to check on dates listed on the Data sheet
- TK had volunteered previously to be chair for SG5
- Hannes volunteered to be the WG-72 chair and TK will be the SC-216 Chair
- SS says EASA has a need to protect this data, need to look at air data controllers
- Hannes will reach out to get some representatives from ANS/ATM
- PM says we need to spend some time going through this, examples of data links and IPS need to reference other guidance
- SS said that in the ESEG there is a talk about what kind of security we need, not the actual tools, more procedures and processes instead of tools
- CR some standards evolve faster than others, RTCA/EUROCAE standards are not as fast as standards like ARINC
- Ted Patmore (TP) brought up info related to Operational Flight Programs, VK mentioned target software or LSAPS, or even configuration tables, SS and PM said to focus on all data to the aircraft
- VK would like to see this group focus on data loaders, FAA does not have oversight on this and our group does not focus on this
- TP mentioned ARINC standard that Delta used to check their data loaders
- CR showed the data sheet for DO-326B revision, mainly focusing on chapter 4 to help with Change Impact Analysis
- Sarah Stern - Boeing (SSB) is going to help from the RTCA side, Stefan will lead from EUROCAE if needed
- PM said no need for technical editor since it is a small change
- KH made sure to make sure that everyone understands that being chair and editor and secretary may be hard, SS concurs
- PM volunteered to be the Secretary for DO-326B revision
- KH asked for the date to be changed to reflect the appropriate date
- AG says she can't reopen SG 1 so a new SG, SG-6 had to be created for this revision
- CR began covering the task sheet for DO-392A revision
- Andrew Drake is available to support SG3, but his unsure of his ability to support and would like to get some help
- SS can help as needed
- SS asked that David Harvie be available Thursday to talk to the DO-392A revision
- CR making a timeline chart for the documents identified in the task sheets
- Matthieu Wilhelm mentioned that part of the idea about doing these updates was to get some field experience with these documents, and try to align with Part IS in Europe
- CR says this may take too much time to align with this document and its revision
- AG dates can be changes easy on the EUROCAE side but the PMC on the RTCA side has already agreed, but could be reviewed in the next year. Asked how long does it need to be extended to gather field experience
- MW says that extending it by 1 year will allow for Part IS experience to be integrated with this revision
- AG says that we can delay a document; it is very common to happen
- KH and AG both said, start the work and then go back to the PMC or TAC if we realize we cannot get done in time
- CR started talking to ED/DO-ISMS and the timeline for the document
- SN said that the timeline for the DO-ISMS is needed to be done sooner rather than later in order to support Part IS, SS said that asking for an extension is not recommended
- CR talking to DO-DSEC now, need to ask for a volunteer for the secretary position
- PM mentioned waiting on Technical editors until we understand the scope, Kanwal agreed
- TK asked for a secretary volunteer to help out, SS mentioned that keeping pacing for the group is helpful with this
- CR asked for an explanation of what is expected of the industry editor role
- DP provided a definition for the secretary role for the SG
- SS volunteered DP for Industry Editor for DO-326B revision, DP agreed
- SS broke down the work that DO-326B work that needed to be done

- CR asked for timing for submittals to TAC/PMC
- AG talked about the process for submittals for OC/FRAC
- DP mentioned that we do not want to descope too soon and deal with the most challenging areas first and realize that it will need to be updated again in the future. Look to current members to identify problem areas that need to be captured and addressed starting out.
- CR asked for who wanted to start conversation about the DO-DSEC document
- TK said that we need to talk to what kind of document to create
- VK and SS agreed, and said that we need to create something more of a spec
- Ted Patmore mentioned the ARINC document for security of data loaders
- VK wanted to clarify securing data loaders or “secure” data loaders
- SS says to look to ARINC 645
- VK wants to focus on data loaders
- SS also wants to make sure we focus on databases as well
- VK also wants to make sure that engine databases, terrain databases need to be addressed
- Ted Patmore also wants to make EFB’s are a focus
- Kanwal says that we need to look at what needs to be included in the term “data” secured
- PM says that most of the data we are talking about has a longer lifetime
- Andrew Drake mentioned that we need to still focus on Operations communications and data because it might have more importance
- SS says we need to map data and then map out what we want to talk to and what we want to avoid and why, also look to the data flows
- Kanwal says to talk about classifying data and then how the data is handled
- Anup says that we need to maintain the chain of trust, and also asked about the data taken from the aircraft, such as security logs
- VK says that data read from aircraft doesn’t have safety impact
- SS made notes of the fact that health management systems can’t delay flights
- TK said that DO-355A says to do this, but no guidance
- Andrew Drake says that Third Parties are becoming more of an issue
- VK says that most larger OEM’s seem to have this covered
- Ted Patmore says that we should review other standards that might help, ARINC is working one for receiving software, also software that is not just going to the aircraft, but also parts and tools, mentioned he could put together a view of what standards already exist and where the holes may be
- TK mentioned that we need to look to what levels exist for the data and the dataflows
- SS says don’t want to set too low of a level, and also wants to make sure that we know what we need in order to be certified, and also look to the ATA Spec as well
- Kanwal volunteered to be the technical editor for SG-5
- SS also wants to make sure that Hanes questions about ground data is protected
- VK wants to also talk about different classes of data and go from the aircraft and work backwards, but needs to ensure the certification aspect and continuity aspect
- TK asked Hanes for what his view outside of the aircraft was that he wanted to look at, and what VK talked to (GPS, ATM, ANS) is what he was looking for
- VK also cautioned that the solution aspect of these problems are outside the scope of our working group, and is dependent on the owners of the system to make their systems more robust
- PM likes this approach so that we do not leave gaps in our guidance, and will provide information to developers
- Ted Patmore mentioned that ADS-B is also in this category
- PM presented aircraft data slides
- Sam brought up the safety considerations related to the some of the aircraft data flows that PM was showing in his slides
- Mitch Trope says we need to make a bubble chart for how this new document and 326/356 go together
- Hanes is wanting to talk to ground systems and how they interact as well

- VK is asking if that is our domain or concern, and Hannes mentioned that this is part of the dataflow for the entire aircraft infrastructure
- CR closed topic related to DSEC to be reopened on Wednesday
- Conversations Closed for the Day

## **Day 2 – 18 Oct 2022**

### **DO/ED-ISMS**

- SS started by showing a presentation for the DO/ED-ISMS
- SS started by covering the purpose for this document
- SS made note that we want to create an ISMS but calibrated for aviation
- SN has a colleague that is going to talk about the ICAO standards that exist and that we should use going forward
- SS talked about the ISO standards – the question is “if you can live with it” then you should support consensus.
- Philip Watson how we identify what risk assessment approaches are acceptable
- SS said that each company has to assess their risk differently
- PW asked again if we are going to change the risk acceptance matrix
- SS and CR said that is not the intent, but there are several different ways to approve risks
- PM asked can we add a cyber-risk acceptance process?
- CR said the safety groups did not want this as part of the safety programs and wanted it to stand alone
- PM, CR and SS said we need to focus on all parts, configuration of software, tools, equipment
- SN said that we need to look back to DO-356A and its similarities just like we do for DO-178C and DO-254
- SS recommends that we utilize the ISO 27001 and 27002 standards. Asked for point of clarification related to how to reference ISO documents
- KH and AG said it is better to be able to point to the documents than to copy from the standard
- Mitch Trope is concerned about tying to ISO
- SS is concerned about stepping on toes trying to rewrite
- KH says ISO is not likely to license
- VK objects due to most US companies use NIST not ISO
- PM want to focus on an objective based approach not focusing on compliance
- SS agrees but we need to be technology agnostic because it is changing too quickly
- PM mentioned that NIST focuses on controls because you can scale them based on company size
- Began conversation about the ICAO Trust Framework, presented by Olga De Frutas Martin, Rob Segers (FAA), Michael Goodfellow (ICAO)
- Rob Segers presented presentation that was given to ICAO by the FAA
- PM asked about the relationship to Part IS
- Bob Segers says that this is more wide ranging and is based initially off of NIST and then considers ISO
- Rob Segers and Jean-Paul Moreaux say that the ICAO guidance goes a little further than NIST or ISO to align with common practice
- SS says that IATA is also working on a similar document, and wants to make sure that everyone is on board
- SS asked if the authorities want to cojoin these documents, CR is going to make a call and see if we can get more experience in the meetings
- Rob said that ICAO was inclusive of authorizes
- Rob said that we want to make sure that the guidance has sector specific information and that you have objectives for everyone
- SS mentioned that we need to be careful with suppliers, because some bigger suppliers

- will not necessarily comply with our guidance
- PM asked for next steps for ISMS group
- Kanwal said that the ISMS conversation is independent of the other 3 topics, and could run in parallel
- SS shared SM-001 from EASA
- Xidong Xu from Boeing is sharing Boeing's Safety Management System
- SN asked for Part IS focuses on, CR answered that Part IS focuses on safety and information security impacting safety
- SS asked how to merge SMS and ISMS
- Conversations Closed for the Day

### **Day 3 – 19 Oct 2022**

#### **DO/ED- DSEC**

- Ted K on data security
- Asked the question on what kind of document do we want? Leaning towards a guideline document vs MOPS
- What kind of data do we want to protect? Level of protection?
- How do we protect data?
- Should include data related to aviation safety. Aviation safety critical data.
- Ground protected data, Nav data
- Databases such as Nav databases
- CC1 and CC2 production data categories from DO-178
- Primary data items such as config tables
- Firmware
- Field loadable config items
- Should organize under on aircraft and ground related data, maybe add Aircraft operator data and air traffic control data
- We need to define ownership of that data
- Need to focus on aircraft safety critical data-Data that touches the aircraft
- The key is to secure data transmitted to the aircraft
- The process of storing data
- Types of SW and distribution should be addressed
- Avoid duplicating what other standards such as 835 and 827 already cover
- We need to set objectives rather than specific details
- Maintain segregation of category of data. Separate sections
- Focus on securing data storage and moving data securely to the aircraft regardless of network
- Network is less secure. We want to have belts and suspenders approach. It is better to include network protection.
- Ensure guidelines do not impose non safety related requirements (FAA and EASA)
- Karan H- MOPS is a very structured document. PMC questioned whether we are doing a MOPS document. Asked that we come back to PMC to get approval if we decided on a guideline document.
- EUROCAE has a placeholder for the document type.
- Change the title of the document to: "Aviation Data Info Security Process Standard"
- Title can be generic and can be explained in the intro and scope (Karan H)
- Change "Nav Databases" to "databases"

#### **Change Impact Analysis (CIA)**

- SS starting conversation related to CIA guidance update to DO-326
- Mitch Trope asked if the ASTM process has been looked at

- CR asked if this more in line with Part 21.101 or 91
- SS says that we need to align to both
- SS also says that the chart identified in the slides do not address the dataflow
- VK cautions re-assessing or doing full assessment of entire aircraft
- VK is also concerned about STC's
- SS is not as concerned about STC's as operators should only worry about their aircraft
- Mitch Trope re-worded VK's comments that they are more focused on third party STC houses
- PM says we want to make sure the applicant does an analysis of the potential impact to security
- SS says ASTM's simple questions work fine for their situation, we need to be more descriptive in our documents
- PM asked why SS discredits the ASTM perspective, SS says the questions that ask are a great start, but is not expanded enough to fit the requirements of Part 25
- Mitch Trope says that ASTM says there are several threshold questions
- SS is concerned about doing the whole process all over again
- CR says Part 21.91 and 101 already help to cover most of these decisions
- CR wants to also review chapter 4 and see what should be there
- SS says to look to Table 4-1 in ED-202, this does not cover verification activities and is a concern
- SS started showing Boeing Position paper related to STC Network Security
- PM has volunteered to make the small changes in chapter 4OC in June, but there is a risk.
- Conversations Closed for the Day

#### **Day 4 – 20 Oct 2022**

##### **DO-392A/ED-206A (ISEM)**

- Alain, Andrew
- Alain presentation
- Includes guidance on vulnerability scoring
- Address performance requirements for event reporting
- Can we manage them in parallel?
- What data should we be collecting?
- Need to be selective on what we collect
- Huge difference with Info Tech IT and Op Tech OT systems
- ERCS has a scheme for calculating risk in cyber
- Numerical equivalent score table was presented by Cyrille-ERCS Score system
- Cyrille to provide link
- Produce guidance on risk assessment
- Start by things that are touched by the aircraft
- Trace out the lifecycle for that information-Whatever forms the entire configuration lifecycle
- Trace to the supply chain
- We can start covering area we are familiar with and invite other industry orgs to ensure others are involved
- Reach out to aviation ISAC, airport side, MRO interest
- Using aviation CVSS, provide a guide on how to interpret the score
- Patching on aircraft is not allowed (Varun)
- It is going to be different for other cases like ground systems
- Ted P - Aircraft will always be different from ground systems
- A good approach is to have the aircraft SW vulnerability management follow the safety process
- Cyrille showed the new ERCS scoring mechanism that can be used to make decisions
- Bill Trussell - Graduated reporting is already done in aviation in that we have suppliers



(material and services) report through service bulletins, which can be elevated to airworthiness directives or emergency ADs depending on severity of impact

- Bill Trussell - Cyber or potential cyber issues can follow a similar path with vulnerability reporting without known exploit, those with a known exploit, those with known exploit and impact data. Sharing of this information among stakeholders is another question.
- Bill Trussell - First responsibility for reporting is to vendor customers. Customers then report to their customers and or regulators as dictated by certificate type and conditions. Loss of trust from the flying public is the ultimate price for non-reporting and inaction.
- David Harvie on CSDS
- Cyber data science within an aviation architectural framework
- A lot of data generation-How do we use the data?
- Has to use existing technology across the aviation echo system
- IT and OT
- Harness data, filter data, tag data
- Collect data, store data, curate data, analyze data
- Leverage AI and machine learning
- How do we use this to support development of guidance?
- How do we know when it is cyber activity?
- Ensure data collected is useful and correct
- Conversations Closed for the Day

## **Day 5 – 21 Oct 2022**

### **DO-392A/ED-206A (ISEM)**

- CR showed agenda for the day
- Alain showed the conclusion for the day of work done on Day 1
- Several Actions to share by Alain
- Several actions from Cyrille to clean up actions
- Dave volunteered to be secretary
- SG-4 SS started talking about how to proceed
- SS said there are several SMS standards to review and utilize for the ISMS standard
- SS says to also look to Part-IS
- SS wanted to utilize ISO 27000, but has deviated from that and we will utilize similar frameworks between NIST and ISO 27000 to help everyone
- SS there are some theory workshops coming along as well to get help from other companies that have done some of these items
- SS is going to do a call out to see if anyone can share SMS lessons
- SS also wants info from other organizations related to SMS from airports, operators and ATM/ANS
- SN brought up that they are only allowing one month to gather material to share
- SS in one month's time, want to get together and determine how to structure the document
- SS says we are missing resources from Airports, ATM, IT/OT experience
- SS says there is also a need for coordination; this document will need to have touchpoints with all other documents
- ISEM is definitely going to need to line up with ISMS
- DSEC will need to be coordinated to fill in some areas of ISMS
- SS says plenary's need to be used to coordinate documents
- SS says that planning for intermediate targets won't be reached before December Plenary, but hopefully after December and before the next plenary
- SS is hoping before December to have everyone get together and meet and read through background documentation, and identify targets to capture in this document
- SS wants to build an on-boarding package of slides to give to people so they know what

documents to have as a background to assist

- PM would it be useful to present a working SMS // ISMS in the next working session
- SS would like to record data sharing sessions in case everyone cannot attend
- PM asked Anna and Karan if they can record presentations and then host and share
- KH, they do not normally record sessions, especially SC meetings, but maybe share presentations from presenters
- PM is wanting to record the presentation and then collect question through email
- PM wants to know if we can record through Webex and can workspace or Aeropus can handle the presentation
- KH wants a list of how many recordings and how long
- SS says should only be three or 4, PM says less than 10
- TK and HA presented SG5 talking points and actions
- Kanwal also provided feedback related to the data mapping
- Jose Romero-Mariona volunteered to be the Secretary
- SG-6 items presented by SS
- AIA items are already being created which will be included going forward
- Mitch Trope has items that need to be looked at
- Sarah Stern will continue to lead
- Call for volunteers from authorities, ANAC, EASA, and FAA already accounted for
- SS says there are also needed changes to align DO326 and DO356
- SN presented information related to WAIC
- Nicolas Durandeu presented a slide deck related to EASA's position on ED-305
- ND AMC 20-42 was not developed for VTOL ground equipment
- Rob Stallard presented slide deck related to Aviation Cyber Security and AAM
- Group was asked how to solve for long development times with new cyber threats daily?  
VK said that aircraft are closed loop, so why does the university group think this is a problem?
- VK Provided FAA update, rule is still progressing//similar working and numbering to EASA//part of omnibus of 12 other rules, AC is done//ready for public review, rules will go out mid-2024, out for comment mid-2023
- CR showed next plenary, Dec 5-9 2022, RTCA, in DC
- KH said we need to get agenda out soon, 30 days before
- CR planning March Plenary, EASA would be planning for Cologne, Brussels if Cologne doesn't work. April 3-7 2023. June 12-16 2023 is in DC, RTCA. Sept 2023 will be in EU – EUROCAE. Sam Masri is going to look to hosting at Honeywell in Phoenix for Dec 2023
- Conversations Closed for the Plenary