SEVENTH FRAMEWORK PROGRAMME

A2COS
safety certification

MINUTES OF MEETING

SECOND USER GROUP MEETING

19-20 SEPTEMBER 2013, ARONA, ITALY

Meeting Title: ASCOS EASA Workshop			
Date 1920/09/2013	Meeting Time 9.00 – 17.00	Meeting Location Hotel Atlantic, Arona, Italy	
Meeting called by	Gerard Temme, Monique Heiligers, CFLY		
Work Package	WP 6.3		
Type of meeting	User Group meeting		
Facilitator	JRC		
Prepared by	Monique Heiligers		
Attendees	Name	Organisation	Remark
	Nuno Aghdassi	AVANSSA	ASCOS
	Lennaert Speijker	NLR	ASCOS
	Jean-Pierre Heckmann	APSYS	ASCOS
	Monique Heiligers	CertiFlyer	ASCOS
	Alan Simpson	Ebeni	ASCOS
	Andrzej Iwaniuk	Institute of Aviation	ASCOS
	Wietse Post	EC-JRC	ASCOS
	Keith Conradi	ESASI	User Group
	Abdoulaye n'Diaye	EUROCAE	User Group
	Rudi den Hertog	FAST	User Group
	Dieter Reisinger	IATA	User Group
	Patrick Mana	SESAR	User Group
	Reinhard Menzel	EC-JRC	ASCOS
	Alfred Roelen	NLR	ASCOS
	Jos Wilbrink	SRC, CAA NL	User Group
	Marielle Roux	Rockwell Collins	User Group
	Robert Zielinski	Polish CAA	User Group
	Susana Bravo Muñoz	APSYS	ASCOS
	Heiko Udluft	Delft University	ASCOS
Additional distribution	Matthieu Feuvrier	APSYS	ASCOS
	Thierry Morteveille	APSYS	ASCOS
	Andrew Eaton	CAAi	ASCOS
	Stephen Long	CAAi	ASCOS
	Ian MacLaren	CAAi	ASCOS
	Terry Longhurst	CAAi	ASCOS
	Gerard Temme	CertiFlyer	ASCOS
	Francesca Margiotta	Deep Blue	ASCOS
	Luca Save	Deep Blue	ASCOS

Stpehen Bull	Ebeni	ASCOS
Jason Denness	Ebeni	ASCOS
Piotr Michalak	Institute of Aviation	ASCOS
Krzystof Piwek	Institute of Aviation	ASCOS
Izaro Etxebarria	Isdefe	ASCOS
Marta Sanchez Cidoncha	Isdefe	ASCOS
Marga Martin Sanchez	Isdefe	ASCOS
Jean-Pierre Magny	JPM	ASCOS
Arjen Balk	NLR	ASCOS
Udo Dees	NLR	ASCOS
Gerard van Es	NLR	ASCOS
Peter van der Geest	NLR	ASCOS
Alfred Roelen	NLR	ASCOS
Jelmer Scholte	NLR	ASCOS
Edwin van de Sluis	NLR	ASCOS
Joram Verstraeten	NLR	ASCOS
Jean-Marc Kraus	Thales Air Systems GmBH	ASCOS
Gabriele Schichtel	Thales Air Systems GmBH	ASCOS
Odile Adrian	Thales Air Systems S.A.	ASCOS
Florence Dietzi-Neyme	Thales Air Systems S.A.	ASCOS
Bernard Pauly	Thales Air Systems S.A.	ASCOS
Richard Curran	TU Delft	ASCOS
Paul Roling	TU Delft	ASCOS
John Stoop	TU Delft	ASCOS
Ron van de Leijgraaf	CAA NL	User Group
Rob van der Boom	CAA NL	User Group
Piotr Michalak	CAO	User Group
Catherine Champagne	Dassault	User Group
Bruno Stoufflet	Dassault	User Group
Ken Engelstad	EASA	User Group
Tomasso Sgobba	ESA	User Group
Maite Truijillo	ESA	User Group
Michel Piers	ESSI	User Group
Eric Peerin	Eurocontrol	User Group
John Lapointe	FAA	User Group
Tom Tessitore	FAA	User Group
Bruno Bidenne	Rockwell Collins	User Group

Okko Bleeker	Rockwell Collins	User Group
John Dalton	SAE	User Group
Jos Nollet	SRC	User Group
Hendrik Schorcht	TUV Nord	User Group

Agenda

Thursday 19 September 2013

9.00 – 9.30	Registration
9.30 – 9.45	**1. Welcome - Wietse Post and Nuno Aghdassi**
9.45 – 10.15	**2. General overview status ASCOS project – Lennaert Speijker** *Form: presentation* *Goal: To inform the user group members about the overall status of the ASCOS project.*
10.15 – 11.15	**3. Results Work Package 1 – Alan Simpson** *Form: presentation by WP1 leader followed by questions* *Goal: To present the results obtained to date in WP1 with a focus on the following submitted deliverables* • *D1.1 Analysis of existing regulations and certification processes* • *D1.2 Definition and Evaluation of innovative approaches to certification*
11.15-11.30	**Coffee break**
11.30– 12.30	**4. Results Work Package 2 – Nuno Aghdassi** *Form: presentation by WP2 leader followed by questions* *Goal: To present the results obtained to date in WP2 with a focus on the following submitted deliverables* • *D2.1 Framework Safety Performance Indicators* • *D2.2 Baseline Risk Picture Total Aviation System*
12.30 -13.30	**Lunch**
13.30-14.30	**5. Results Work Package 3 – Jean-Pierre Heckmann** *Form: presentation by WP3.5 leader followed by questions* *Goal: To present the results obtained to date in WP3 with a focus on the following submitted deliverables* • *D3.1 Total Aviation Safety Assessment Methodology* • *D3.2 Risk models and accident scenarios*

14.30– 15.15	**6. CATS – Jos Wilbrink** *Form: presentation followed by questions* *Goal: To inform the ASCOS team about (items related to) CATS relevant for the ASCOS project*
15.15 – 15.45	**Coffee break**
15.45 – 16.30	**7. ECCAIRS – Reinhard Menzel and Wietse Post** *Form: presentation followed by questions* *Goal: To inform the ASCOS team about (items related to) ECCAIRS relevant for the ASCOS project*
16.30 – 17.00	**8. Evaluation – Nuno Aghdassi** *Form: plenary discussion* *Goal: to evaluate whether the goals of the first day of UG meeting have been achieved*
17.00	**Closure**

Friday 20 September 2013

9.00-9.15	Walk-in
9.15– 10.00	**1. Future Work in Work Package 1 – Alan Simpson** *Form: short presentation by WP1 leader (15 min) followed by discussion and feedback* *Goal: To present very briefly the scope of the future work in WP1 with a focus on the following on-going deliverables:* • *D1.3 Development of new certification approach* • *D1.4 Certification E-learning Environment* *To obtain input from the User Group relevant for the future work.*
10.00-10.45	**2. FAST – Rudi den Hertog** *Form: presentation followed by questions* *Goal: To inform the ASCOS team about (items related to) FAST relevant for the ASCOS project*
10.45-11.15	**Coffee break**

11.15 – 12.00	**3. Future Work in Work Package 2 – Nuno Aghdassi** *Form: short presentation by WP2 leader (15 min) followed by discussion and feedback* *Goal: To present very briefly the scope of the future work in WP2 with a focus on the following on-going deliverables:* • *D2.3 Process Safety Performance Monitoring* *To obtain input from the User Group relevant for the future work.*
12.00 -13.15	**Lunch**
13.15 – 14.00	**4. Future Work in Work Package 3 – Jean-Pierre Heckmann** *Form: short presentation by WP3.5 leader (15 min) followed by discussion and feedback* *Goal: To present very briefly the scope of the future work in WP3 with a focus on the following on-going deliverables:* • *D3.3 Tools for risk assessment and user manual* • *D3.4 Overall safety impact results and user manual* • *D3.5 Aviation safety standards recommendations* *To obtain input from the User Group relevant for the future work.*
14.00 – 14.30	**5. Planned Work for Work Package 4 – Alfred Roelen** *Form: short presentation by WP4 leader (15 min) followed by discussion and feedback* *Goal: To present very briefly the scope of the planned work in WP4. To obtain input form the User Group relevant for the Work Package.*
14.30 – 14.45	**6. Input for Work Package 5 – Monique Heiligers** *Form: Distribution of questionnaire for completion by User Group members* *Goal: To obtain input form the User Group relevant for the Work Package.*
14.45 – 15.00	**7. Evaluation – Nuno Aghdassi** *Form: plenary discussion* *Goal: to evaluate whether the goals of the second day of UG meeting have been achieved. To summarize the topics for further cooperation in the coming period*
15.00	**Closure**

Document Change Log

Version	Author(s)	Date	Affected Sections	Description of Change
1.0	Monique Heiligers	29/10/2013		First approved version.

1 Meeting background

A User Group that includes regulatory bodies, aeronautical product manufacturers, specific safety, certification related advisory bodies and other relevant parties has been established for the ASCOS project. This User Group will provide an independent view of the work on the progress of the project. In the development phase, it will interact with the team and provide comments from a regulatory, safety, and certification perspective on the project plans. In the final stage, in view of draft project results, the User Group will comment on the best way to complete the work and will advise on how to move towards implementation of a new certification process.

The User Group will be kept informed about the project and will be able to provide input and feedback on results by different means. One of these means is the organisation of a yearly workshop: the user group meeting.

This document relates to minutes of the second user group meeting for the ASCOS project. During this meeting the proposed certification process adaptations, and safety methods and tools under development are discussed with user group members, questions are answered. User group members are also able to provide feedback on the certification process, safety work and case studies.

2 Meeting objectives

As stated above, the overall goal of the user group meeting is to keep the user group members informed about the project, to obtain input from the user group members, and to receive feedback from the user group members. In more detail, the meeting objectives for the second user group meeting were:

- To inform the user group members about the overall status of the ASCOS project
- To present the results obtained to date in WP1, WP2 and WP3 with a focus on the submitted deliverables for these work packages
- To obtain feedback from the User Group members on the results obtained so far in WP1, WP2 and WP3
- To inform the ASCOS team about (items related to) development particularly relevant for ASCOS:
    - Causal model for Air Transport Safety (CATS),
    - European Coordination Centre for Accident Incident Reporting Systems (ECCAIRS), and
    - Future Aviation Safety Team (FAST)
- To present very briefly the scope of the future work in WP1, WP2, WP3 and WP4
- To obtain input form the User Group for the future work in WP1, WP2, WP3, WP4 and WP5.

3 Minutes of Meeting

3.1 Welcome – Wietse Post and Nuno Aghdassi

Wietse Post welcomes all participants in Arona, Italy on behalf of the Joint Research Council (JRC). Nuno Aghdassi thanks the JRC for hosting the meeting, and expresses thanks to all user group members for

attending the meeting. Nuno Aghdassi emphasises that one of the main purposes of the user group meeting is for the ASCOS team to listen to the user group members, in order to find out how to make the project of use for them. The User Group members are encouraged to provide feedback, to interact and to raise questions. All attendees shortly introduce themselves.

3.2 General overview status ASCOS project – Lennaert Speijker

Lennaert Speijker explains that the intention of this presentation is to give an overview of the background and scope of the ASCOS project. The different project phases will be presented, what we have achieved so far, where we are now, and what is still planned for the next two years.

The goal of the ASCOS project is to come up with a proposed certification approach that is more time efficient and will lead to an improvement of safety. ASCOS considers the total aviation system as a whole and aims to integrate domains.

Lennaert Speijker explains that the ASCOS Description of Work (DoW) already provides a (predefined) scope for the case studies in WP4. According to the DoW, what is considered in the case studies should lead to safety enhancements on a relatively short term: 2020. This implies that actual introduction of the safety enhancements by 2020 will only be possible if the authorities take up the ASCOS results, and time after ASCOS (from 2015 – 2020) is used to complete the certification processes..

Within the ASVOS DoW, runway excursions are not covered,, despite their relatively high frequency as derived within ASCOS WP2 during the analysis of incident/accident data (see slide 6). During the proposal phase this high frequency was not anticipated, and therefore runway excursions are not in the DoW.

Nevertheless, Lennaert Speijker mentioned that there is some flexibility in the DoW. If there is a good reason for changes in the DoW, this may be proposed to the EC. Therefore, he emphasizes that the User Group members are invited to provide their ideas on most beneficial case studies, encouraged to provide input to the ASCOS project, and states that their involvement in the validation of the results will also be highly appreciated.

Based on slides 9-13, Lennaert Speijker gives an update of the status of the different ASCOS project phases:

- Within Phase 1, the identification of shortcomings and bottlenecks in the existing regulations and certification processes and the definition and evaluation of potential certification process adaptations are finished. The development of the proposed certification process is still ongoing and delayed until the 1st of December 2013. The proposed certification approach will be tested in WP4, which will take into account the user group comments and feedback. At the end of the project the ASCOS team will update the certification approach with lessons learned and will present the final proposed certification approach.
- Phase 2 has established a framework of Safety Performance Indicators for the operational issues in the EASp and a baseline risk picture for the total aviation system. This phase is nicely on track.
- Phase 3 looks at safety methods and tools to deal with future and emerging risks, and is currently halfway.

- Phase 4 applies the proposed certification process within four case studies, and will start in January 2014. WP4 also intends to quantify the safety impacts of the changes proposed in the case studies, assuming that these changes will be introduced within the timeframe up to 2020
- Phase 5 will start in January 2014, and will validate the products of the ASCOS project.

For each phase a separate presentation will be given, both about results and about future work.

To conclude the presentation Lennaert Speijker explains that interaction between the ASCOS team and the User Group members can be accommodated in different ways: by attending our workshops such as this user group meeting, but the ASCOS team can also visit User Group members separately. This can be at a small scale, one-on-one meetings discussing technical matters, but can also be at a larger scale, giving workshops to employees. A large technical meeting with 20 EASA staff has already taken place in April 2013, and in July 2013 there was a small technical meeting with SESAR members. Patrick Mana confirms that the SESAR meeting was very effective.

Keith Conradi asks whether this ASCOS project is an initiative from the European Commission (EC). Lennaert Speijker answers that the EC initiates these projects with a call for tender, which asks for projects contributing to reaching the goals as set out in the ACARE Vision 2020 report. The ASCOS project proposal was submitted and accepted by the EC. The EC funds a large percentage of the ASCOS project.

Marielle Roux inquires about the link with SAE S18 and EUROCAE WG63. Lennaert Speijker explains that he presented the ASCOS objectives to both entities. Marielle Roux asks whether an agreement was reached on how to continue the exchange of information with these two groups. Lennaert Speijker answers that Jean-Pierre Heckmann of the ASCOS team is involved in these groups. Within ASCOS WP3.5 Jean-Pierre Heckmann plans to specifically address this link, In October 2013 he will also present the ASCOS project to the SAE S18 and EUROCAE WG63 in Sevilla, Spain. Jean-Pierre Heckmann adds that in order for the ASCOS products to be applied, they need to be recommended for implementation by these working groups. Abdoulaye n'Diaye (the EUROCAE Secretary General, member of the User Group) adds that within EUROCAE, WG63 seems the best way to connect to ASCOS. EUROCAE is starting to have a stronger role in the standardization of civil aviation equipment, and EUROCAE may benefit from the activities and output of the ASCOS initiative.

3.3 Results Work Package 1 – Alan Simpson

Alan Simpson explains that he is covering for the WP1 leader Bernard Pauly. Unfortunately Bernard Pauly could not attend this meeting.

Alan Simpson briefly recalls some important issues relating to the work in WP1:

The FAA expressed concerns in their report on aircraft certification (Commercial Airplane Certification Process Study, March 2002), particularly in relation to areas where assumptions were being made by one stakeholder, that were not taken up by other stakeholders. For example: assumptions by manufacturers of aircraft were not taken up by operators or maintenance companies. There were also concerns about the implementation of regulations across the entire domain, for example: in some parts of Europe the implementation is ok, in other

parts it is not. The issue was also raised whether today's system will be adequate for the upcoming changes, emerging risks, etc. An example is the Electronic Flight Bag, this introduced a whole new series of concerns for regulators that weren't there when paper was used.

Alan Simpson emphasizes that WP1.1 provides a snapshot of the current regulatory framework, it does not intend to perform a total analysis. Instead, WP1.1 defined a process or a framework that the rest of WP1 can use. WP1.1 addresses the gaps in the regulations, and the bottlenecks (where regulation is taking too long). WP1.2 took more of a 'blue sky' approach, thinking of what could be done to improve the current certification processes.

WP1.1 aims to allocate priorities to the key shortcomings and bottlenecks. This is done by looking at accident statistics and accident trends in the European domain. Within WP1.1, the following three items were subsequently identified: 1. The key risks, 2. what parts of the regulations cover these Risks, and 3. To what extend these regulations were implemented. Prioritisation is then based on the hazard classification of the accident and the degree to which the regulations were implemented. This framework for prioritisation gives the ASCOS team a good process that can be used, and gives insight into the most important issues to focus on.

Within WP1.2 the ASCOS team identified eight options to adapt the regulatory/certification process. Alan Simpson explains that the eight options were analysed , but that this was a 'quick and dirty' analysis of the different options. The end product of WP1.2 appeared to be more complicated than expected. The outcome was not one single new certification approach, but a series of recommendations in what way WP1.3 should progress .

Patrick Mana says that it is important for the ASCOS team to fully comprehend the scope and timeframe of the project. From a regulatory point of view, 2020 can be considered 'tomorrow', because big changes in the regulatory framework may take several years to implement. Finally, should be aware of the fact that the expectation is that ASCOS products will be applicable to/usable for a very wide range of changes.

Abdoulaye n'Diaye points out that we are in a time of change. The air-ground integration within SESAR and NextGen creates a new aviation context. 2020 is very close, and EASA is also already on its way to change how they work, and are very much accelerating. In other words: the world around ASCOS is changing at a rapid pace. Abdoulaye n'Diaye points out that there should be much interaction between ASCOS and these 'changing' bodies in the ASCOS environment. How can ASCOS provide the 'extra' within this time of change? Alan Simpson responds that in April 2013 there was an ASCOS-EASA meeting to –amongst other issues - identify how ASCOS can be of value for EASA. It was concluded that one of the areas where ASCOS can provide the 'extra' is by finding a way to manage the interfaces between the different certification domains.

Abdoulaye n'Diaye adds that the introduction of Remotely Piloted Aircraft Systems (RPAS) is an important issue. If ASCOS could cover this issue, how to certify RPAS, that would be a tremendous added value. Lennaert Speijker responds that WP4 deals with case studies. In principle, it could be possible to take RPAS as an example in one of the case studies. However, in the research proposal to the EC, we have stated that ASCOS will result in safety enhancements. This should also be apparent from the case studies. If we take RPAS as the

subject of one of the case studies, it cannot be assured that there will indeed be a safety enhancement, since there is no baseline available for RPAS. This would change the output of the project slightly. On the other hand, it is obvious that we have to cope with new technologies such as RPAS, and apply the proposed certification approach in order to see how well these new technologies are covered. Jos Wilbrink and Patrick Mana support Abdoulaye with respect to the benefits of looking at RPAS in ASCOS. We should discuss the possibility to study RPAS in a case study further. ACTION 1

Jos Wilbrink adds that with new systems like RPAS, one has to act right now to be ahead of any problems. If we wait for the new system to be introduced, then establish a baseline for safety, and then start to improve, we might be too late. It is better to anticipate now.

Lennaert Speijker concludes that there are good arguments to raise this subject to the EC. We will come back to this tomorrow in the WP4 future work presentation. If there is a strong wish from the User Group to include RPAS, we will discuss this with the EC.

Jos Wilbrink points out that in the ATM domain the number of severity classifications is decreasing (possibly due to a lack of time). Since the severity classification A is used to determine the focus of the ASCOS project, this might have an effect. ACTION 2

Patrick Mana warns that cost and time issues should be carefully considered when deciding for an 'evolutionary change of regulations'. If this approach is chosen, one should really end up with substantial changes. Avoid spending a lot of time and money and not changing anything.

3.4 Results Work Package 2 – Nuno Aghdassi

Nuno Aghdassi explains that the goal of WP2 is to create tools for Continuous Safety Monitoring, using a baseline risk picture for the safety performance of the total aviation system. Within this presentation two sub work packages are covered: WP2.1 and WP2.2.

Work Package 2.1 defines a framework of Safety Performance Indicators for the total aviation system, examples of SPIs are given in slides 10-14. Work Package 2.2 creates a baseline risk picture for the Total Aviation System. This baseline risk picture was created by

- Carrying out a comprehensive review and highlighting relevant statistical snapshots from annual safety reports produced by EASA, Eurocontrol, etc.
- Quantification of key operational issues identified in the EASp using the NLR Air Safety Database (which uses ECCAIRS to manage safety data) and an improved Causal model for Air Transport Safety (CATS).

Jos Wilbrink asks whether the list with SPIs was checked against the list with EC regulations for incident/accident reporting? Be aware of the fact that there is discussion whether this list is too long. Make sure that the data you need are already on this list, be careful not to ask for an extension of this list. Nuno

Aghdassi replies that the ASCOS team did not go as far as comparing with the EC list, this is a good suggestion. ACTION 3

Nuno Aghdassi presents the main objective of WP2: to create a baseline risk picture for the Total Aviation System.

Patrick Mana mentions the fact that the Eurocontrol Integrated Risk Picture (IRP) is a risk model somewhat similar to the Causal Model for Air Transport Safety (CATS) focusing on Air Traffic Management (ATM) occurrences between 1999-2007: on fatal accidents and accidents that had a direct ATM influence. It provides frequencies per flight for the ATM contribution to accident risk in 2007. The IRP also predicts the influence on the frequencies by improvements that would come into force in the ATM domain by 2012.

Jos Wilbrink remarks that in the report on WP2.2 the focus seemed to be on 2005-2006, is there a possibility that due to this limited timeframe the ASCOS team has missed trends? Nuno Aghdassi answers that the ASCOS team did not miss data, because these recent reports cover larger periods of time. Also, the ASCOS team linked data between specific accidents to the data.

Patrick Mana mentions that SESAR is progressing on an update of IRP, called Accident Incident Model (AIM), which will incorporate the possibility to include future events. The big question is how to capture the emerging events, that one does not yet have data for. Patrick Mana warns the ASCOS team to not only learn from the past, but to explicitly look at the future, that is were the added value really lies. Nuno Aghdassi clarifies that WP2.2 does look at the past, which is exactly its purpose. WP2.2 will serve as input for WP3.1 and WP3.2 which will look at the future. Lennaert Speijker adds that the presentations so far have focussed on the current situation and historic data. Future events and how these will be handled will be covered in other WPs (and in particular the WP3), and will be part of tomorrow's presentations.

Keith Conradi asks whether the ASCOS project also incorporates serious incidents? This could be beneficial since accident data are few. Nuno Aghdassi explains that this was not in the scope of WP2, but that in future ASCOS work serious incidents will be taken into account. Alfred Roelen adds that this is exactly the reason why ASCOS uses a model based approach for baseline risk picture, this will provide the link between lower types of occurrences and accident risks.

3.5 Results Work Package 3 – Jean-Pierre Heckmann

Jean-Pierre Heckmann explains that the objective of WP3 is to develop a total aviation system safety assessment methodology, with supporting safety based design systems and tools, for handling of current, emerging and future risks. This is to be achieved by representing current and future risks in accident and accident avoidance scenarios in such a way that it can be used in the certification process.

WP 3.1 aims to develop an aviation safety assessment methodology. Jean Pierre Heckmann explains that the Future Aviation Safety Team (FAST) approach and CATS were selected as basis for the methodology, in order to be able to capture the future risks . FAST has made recommendations which were not implemented, ASCOS wants to take these recommendations and implement them. The aim is to have an impact not on the

Certification Specifications, but on a lower level, e.g. the recommended practices, lessons learned should be introduced at this level. Jean-Pierre Heckmann also points out, that in the development process we should not ask for documents that are only useful for certification, the documents we ask for should be an integral part of the documents needed for the development of the product itself (e.g. EUROCAE, RTCA, and/or SAE standards).

Marielle Roux asks whether FAST includes ground accidents. Alfred Roelen replies that its focus is the total aviation system, this includes ground accidents. Marielle Roux notes that it was mentioned that a technology change can be part of this process. Does this mean that we can alleviate the certification process for new technologies? Jean-Pierre Heckmann responds that this is indeed the case.

Patrick Mana is interested in EASA's support for FAST.. Lennaert Speijker explains that EASA has developed a follow up of the FAST approach called EME1.1. Through developing EME1.1 they recognize FAST as a good basis, that is what this statement means. The FAA was involved in the FAST initiative, and also recognizes FAST. Additionally, EASA has asked ASCOS to apply the EME1.1 in the case studies in WP4 and at the ASCOS - EASA workshop on 19 April 2013 it was agreed to proceed accordingly.

Patrick Mana mentions that it is not entirely clear what the novel part is of the work in WP3.1, since both FAST and CATS have been around for a long time. Jean-Pierre Heckmann explains that FAST and CATS in itself are not new, the combination, however, is new. The novelty lies in the fact that FAST and CATS are put together in one consistent method. Lennaert Speijker adds that this question was also raised during the SESAR ASCOS meeting in July 2013 and the review of D3.1. This point was well taken and the updated version of D3.1 will contain a thorough explanation of what is new within WP3.1. Actually, this is the reason why D3.1 is delayed.

Abdoulaye n'Diaye requests the ASCOS team to refer to EUROCAE documents correctly. For example: ARP4754A was developed together with EUROCAE. Please mention this correctly in all ASCOS presentations and documents: ED79A/ARP4754A. ACTION 4

Jean-Pierre Heckmann explains that WP 3.2 focuses on risk models and accident scenarios. The aim is to provide an integrated approach to risk modelling in which human factors and cultural aspects are considered in connection with technical and procedural aspects. Note that it was concluded that human factors and cultural aspects cannot be adequately represented in a risk model like CATS. Jean-Pierre Heckmann explains the concepts of precursors, fault trees, pivotal events, initiating events and end states. The red components in slide 14 are the components that were missing and needed to be added. If the precursors are known during the design phase, one can anticipate these precursors. One can accommodate the database such that it is easy to get the relevant data out of the database. E,g, 'brakes too hot' should be included in the database, and easily accessible, record temperature during take-off.

Jean-Pierre Heckmann poses questions and provides the following answers:

The question "Is the level of detail of the risk model appropriate for application of the model in the context of certification?" can be answered with 'yes'. If all failure modes, precursors, etc. are identified at the start of the project, and applied from the start of the project, the model can be appropriate in the context of certification.

For the question “Do we need to develop this part of the model for each new certification question, or is there need for a ‘universally applicable’ list of precursors and links with the model?”, the answer is that 90% of failure conditions are the same across the board, only 10% will change with a new project (new system, procedure, etc.). So the list is not fixed, not universal, but it can be reused every time and amended.

The question “Is the proposed “modification factor” for representation of safety culture and safety management sufficient and acceptable?”. Answer: it was already mentioned that ASCOS does not incorporate this in the CATS diagrams.

The question “How do we determine that the quantification is correct?“ At the moment there is no answer to this question. The quantification is based on theory, on paper, reality will show whether we are right. *Post-meeting note: the WP5 “Validation” should address this issue and come up with a reasonable conclusion.*

The question “How can a risk model be applied in certification?”. The answer is that this is part of the ongoing work of ASCOS, and is being addressed in W1.3 and WP3.5. *Post-meeting note: deliverable D3.2 motivates the various potential usages in safety management, including the management of changes in the aviation system.*

Abdoulaye n’Diaye mentions that the added value of looking at system level is apparent (brakes are a good example). It could create some new findings, which might require additional design, this might be negative for the Original Equipment Manufacturer (OEM) because it might cause more work. But on the other hand, we also look at event trees, where we might find mitigation factors, this could be positive for OEMs. We have overloaded the design phase with requirements, but from this analysis it might become clear that requirements should be made in another domain such as e.g. ATM or ground. This is beneficial for OEM. Highlight both sides of this story.

Keith Conradi asks whether the AAIB can put anything in the accident reports that can help ASCOS in their further analysis? Jean Pierre Heckmann replies that for accidents there are official reports. Most of the lessons learned however are from in service events, they are reported, but do not end up in official reports. These are exactly the data ASCOS needs in detail to fill the fault trees: what has happened exactly? In the reports, it would help us if AAIB could word exactly what the recommendation is, and pinpoint the real cause or problem. Keith Conradi explains that the AAIB is very keen on the wording of the recommendations, but there are some constraints: with safety recommendations AAIB does not come up with solutions, and AAIB always carefully considers where to direct the recommendation (to the regulator or to the manufacturer).

Jos Wilbrink adds that there is a similar problem in The Netherlands, and the following solution is now in place: if the safety board directs a recommendation to, e.g., the Air Navigation Service Provider (ANSP), the government checks whether the ANSP complies. Also, the accident investigation board sometimes forces different parties to sit together. This results in the government having a good idea of what happened with the recommendations. This system, however, has only been implemented recently.

Patrick Mana says that he likes the proposed model and that it will help to have a common shared understanding of what is happening. But how do you prevent to become overconfident with the model

(people getting 'lazy'), and forget what it was actually about, with all limitations etc. Jean-Pierre Heckmann points out that this is a problem with any system or model. Within this specific model we use two different approaches: quantitative filling of the fault trees, and on the other side common mode analysis approach (not based on the fault trees, but on the checklists). If things have been forgotten in the fault trees, it should come up during this analysis. Then the decision is made whether it is acceptable or not. Patrick Mana replies that this will work for aircraft, but how about ATM for example, where there is a large involvement of the human operator? Jean Pierre: the process will be the same, but the weight can be on other factors.

Patrick Mana points out that the focus in the fault trees is very much on the aircraft side. Will the same level of detail be achieved on the ground part, or the ATM part? How deep do the fault trees need to be developed for each area? It is proposed by Nuno Aghdassi and accepted by the participants to continue this discussion during the break.

3.6 CATS – Jos Wilbrink

Jos Wilbrink explains the objective of CATS: The prevention of aircraft accident through better understanding of aviation risks in terms of causes and magnitudes. CATS uses a total systems approach. CATS provides the government insight into the areas that need attention, thereby providing guidance as to where to allocate the limited resources. A sensitivity analysis shows how much influence certain policy or measures might have, and what the end result will be.

Keith Conradi asks whether any Dutch operators show interest in CATS to use it in their SMS? Alfred Roelen replies that KLM was involved in the expert group during the development. The CATS team have asked KLM if they would be interested in a CATS model specific for KLM, but at that time they did not feel comfortable with a model based approach. But now they are developing something similar in-house, which is good, because in house development is more trusted by people who need to use it. So, the answer is that they use CATS to develop their own model.

Patrick Mana remarks that it is good to see that the human is part of the model. It shows how difficult it is to capture the human, and that not everything can be attributed to training.

Abdoulaye n'Diaye points out that it is important to understand that the industry is not yet comfortable with putting a number on the human. Abdoulaye n'Diaye is interested to follow this in more detail. But keep in mind that we need to go through this change with the whole community, and they are not yet ready for this. A model like this can help, but we should not go too quickly. Jos Wilbrink adds that his experience is that one needs to go through a lot of discussion before people start to trust the numbers. Patrick Mana further clarifies that for aircraft it is accepted to use numbers. But within SESAR they are now trying to apply this on the ground, and it becomes apparent that people are not ready to put numbers on humans. Especially because it can be misused, e.g., as an argument to tell people that they are not performing according to 10^{-8}.

3.7 ECCAIRS – Wietse Post, Reinhard Menzel

Wietse Post explains that ECCAIRS is more than a database, it comprises three activities: network, services and tools. In relation to ASCOS it can be stated from ECCAIRS experience that it is important to maintain the taxonomy. This is crucial for success in the long term, the taxonomy should evolve with changes in the industry.

A word of warning is given by Reinhard Menzel in relation to slide 13: access to the databases needs to be established, this is a legal/administrative issue ACTION 5. There are, however, also issues related to the quality of the data. Also, the JRC does not have, or pretend to have, any specialist knowledge on the transport domain.

Heiko Udluft asks whether there is uncertainty in the data due to bad data? Reinhard Menzel replies that he has no idea. A bias could occur due to the fact that one operator might be a better reporter than another. If this operator happens to operate a specific fleet, a fleet bias might result. It is impossible to correct for this, since the operator name is not known in the database, so you cannot ask the operators to change.

Patrick Mana asks whether the data only relate to aircraft based in Europe and only flying in Europe? Reinhard Menzel explains that the data also include occurrences that happened outside Europe but by a European operator. But this can be filtered out if required.

Alfred Roelen explains that the CATS model will provide the relation between the safety performance indicators and the overall picture. Reinhard Menzel subsequently asks whether these are combined in the fault trees, and then changed monthly? Alfred Roelen replies that this is indeed the case, and that this will result in the continuous safety-monitoring tool. Reinhard Menzel further asks whether incidents will be incorporated in the model. Alfred Roelen explains that incidents are an integral part of the CATS model, some of the end states are incidents, some are accidents.

Keith Conradi mentions that he is glad that the problem of quality of data was highlighted. The advice is to keep the forms etc. easy and simple, not accompanied by an elaborate manual. Reinhard Menzel answers that the JRC is currently working on this, and this issue has their attention.

3.8 Evaluation – Nuno Aghdassi

Nuno Aghdassi thanks the user group members for their questions and valuable contributions, and thanks the ASCOS presenters.

Nuno Aghdassi briefly recalls the main points of discussion of today:

- The ASCOS interest and desire to have more interaction with the user group members. One on one sessions between the ASCOS team and any User Group member are very much appreciated
- Point of attention is to keep ASCOS relevant in an ever-changing environment, ASCOS should continuously engage with other agencies or partners in this changing environment.

- The proposal to include RPAS in the case studies, which will be further discussed on Friday 20 September
- The comparison of the SPIs with the list from the EC for accident reporting
- The industries' lack of preparedness to accept the fact that numbers (frequencies) are allocated to human operators, and as a result: the fact that ASCOS needs to carefully consider how analysis of human operator failures is presented to the outside world.

3.9 Future Work WP1 – Alan Simpson, Heiko Udluft

Alan Simpson presents the WP1.3 objective: to develop an outline certification approach that could be used to cover the certification changes in the Total Aviation System. WP1 proposes to use modular safety arguments. The overall safety argument can be broken down into different domains, whilst keeping the overview of inter-domain relations. In the end, the arguments will be re-integrated.

Keith Conradi asks how many WP1 questionnaires were returned? Alan Simpson answers that none were received from the User Group members, and some were received from the ASCOS partners. There has, however, been some discussion with CAAi through an interview. Keith Conradi mentions that the questionnaire was difficult to get into. This statement is supported by Rudi den Hertog. Alan Simpson indicates that it was not intended for each User Group member to fill in the entire questionnaire. Please fill in what you can. Also it is possible (within limits) to have an interview with user group members if this is appreciated. *Post-meeting note: The WP1 follows a stepped approach, in which a first proposal for certification process adaptations is established this year. Based on the experience and results gained within the case studies and the validation activities, it is foreseen to update the proposed certification approach towards the end of the project. Therefore, it remains possible to provide feedback and inputs towards the end of the project* ACTION 6 & 7

Marielle Roux mentions that the objective of ASCOS is to make the certification process more efficient and flexible. It is not clear yet how ASCOS will exactly do this. Marielle Roux was expecting to see more or less flexibility depending on the new technology. Alan Simpson explains that when the ASCOS team looked at new technologies, it was found that there is not a certification approach off the shelf that can be used. The conclusion so far, is that a quite successful approach is to use safety arguments. But it turns out to be quite difficult to provide a solution for all different innovations. WP1 will focus on a method how to write safety arguments, which everyone can then apply to their particular innovation.

The following subject was raised: the FAA started to think about new organizations, supported by type certificate holders, and asking them to help build the new regulations. Does ASCOS work with certification authorities to see how they are progressing? Alan Simpson answers: allowing more flexibility forces people to think more with a degree of competence. Therefore an increased demand on the competence within the certification authorities (EASA) will have to be addressed by EASA. For safety arguments there is not a definitive guide, which is strange since it is used a lot. ASCOS hopes to provide some guidance on this, and also hopes to create example arguments for the different certification approaches, which can be used. ACTION 8

Alan Simpson concludes that all User Group members that are present are comfortable with the safety argument approach.

Keith Conradi mentions that the AAIB is currently looking at good practices, recommended practices and is trying to share these good practices, and additionally, to agree among states on good practices. For this process, the AAIB also used questionnaires and interviews. Eventually, the results of this study will be published.

Heiko Udluft presents the plans for the e-learning environment. A knowledge tree, indicating which knowledge is needed for each module, is presented. Behind each module there is a course with course material and examination (if applicable).

Alfred Roelen asks whether there is any guidance about the best way to present the material, because just uploading papers or deliverables is not going to get us there? Heiko Udluft responds that TU Delft is developing content guidelines ACTION 9

Jos Wilbrink asks whether there is an update foreseen of the modules on a regular basis? Lennaert Speijker explains that the initial information in the e-learning environment needs to be ready before the start of the case studies on 1 January 2014 ACTION 10. This is also a good moment in time to evaluate the material with interested user group members ACTION 11. From 1 January 2014 onwards, an update mechanism should be in place, led by WP6 until the end of the project ACTION 12. Jos Wilbrink confirms that it is good to have an update loop within project.

Abdoulaye n'Diaye proposes to dedicate a separate module (at the top of the knowledge tree) to explain the total, global, changing framework in which ASCOS is set. For example: how will ICAO play a role? Start from the top and work your way down to your (ASCOS) very special tool. ACTION 13

3.10 FAST – Rudi den Hertog

Rudi den Hertog gives a presentation on FAST from a chief engineer's point of view. Topics that are covered are the cosmic cycles of accidents, first occurrences, pre-cursors, areas of change and human habituated response.

Dieter Reisinger mentions that he supports every word of the presentation. In particular the (bad) practice of patenting good ideas, this results in the fact that, e.g., flight mode annunciations are not standardized, this might lead to confusion for pilots.

Jean-Pierre Heckmann mentions that, unfortunately, organisations have no memory. It is very important to accommodate the transfer of knowledge when people leave the organisation. Rudi den Hertog suggests that the best way to handle this is to set up a local intranet with Wiki's to transfer knowledge; this could be part of an SMS. Abdoulaye n'Diaye adds that the memory should not be in the organisation, but in the good practice of the community: capitalise what we learn in the practices we use in the Aviation community.

3.11 Future work WP 2 – Nuno Aghdassi

Nuno Aghdassi presents the future work in WP2, the objective of WP 2.3 being the development of an improved process for safety performance monitoring. The following three questions are stated:

- What is understood as “an improved process for safety performance monitoring”?
- Should FDM be used as a means to enhance CMA in a multi-stakeholder model?
- What tools can be developed to support continuous safety monitoring?

Dieter Reisinger, referring to the second question, states that the answer Is ‘yes’ when the focus is on the total aviation system. The Latin American region can be considered state of the art where it concerns cooperation between industry, airlines and IATA. Ninety percent of all Latin American airlines are sharing flight information. They often find that problems are not specific for an airline, but specific to a region, or an airport, or a runway. In order to be able to reach such conclusions one needs to share data. In Europe data are not shared in this way, e.g. due to union constraints. So, the answer is ‘yes’, but we need a legal framework under which these data can be shared. Nuno Aghdassi adds that there needs to be a balance between which data can be available and which cannot be available, and to whom data can be available. Keith Conradi further explains that this challenge should not be underestimated within Europe. It is hard to get data for accident investigation. The AAIB had problems with proprietary data and confidential information, and had to use stand-alone computers, that nobody else could access. This would never work for a continuous monitoring system. Also do not forget the Freedom of Information Act (FOIA), one need to be careful where to put the information.

Dieter Reisinger mentions that it would be nice to have a system in place with which the cockpit crew could take snapshots of flight situations, when they think this is necessary.

Andrzej Iwaniuk explains that the new item in this deliverable is the link between SPIs en precursors for all the main operational issues for Commercial transport. Analysis of precursors is not simple. Second new item is flight data monitoring, and how this can be used in the continuous monitoring approach.

Wietse Post states that the ASCOS team should not expect the integration of flight data within WP2.4. Lennaert Speijker clarifies that a high level view of which Flight Data Monitoring (FDM) inputs are necessary for a proper method of Continuous Safety Monitoring should be described in the WP2.3 document. It should also describe what the output should preferably be, and whether it is possible to produce this output within ASCOS. ACTION 14 And if we find problems with respect to, for example, FDM, and conclude that it cannot be taken into account within ASCOS, we should describe what the benefit would be if it could be integrated, and the steps forward. If – and in what way – 2.4 can accommodate these requests within ECCAIRS, is up to WP2.4.

Dieter Reisinger comments on the third question posed in the presentation. In the past, the focus has been on reporting systems and FDM. What is not used are flight simulator data, although there is a lot of information that can be collected from flight simulator sessions (for example: engine failure after take of is trained every 6 months). Nuno Aghdassi replies that some of the training companies (e.g., CAE) offer simulator operation quality assurance: data, which can be used to assess training standards. But this is a good point.

Jos Wilbrink refers to question 2: a colleague attended two workshops on this, and the conclusion was: the amount of data is so large that it can only be handled by super computers. Which would mean that the focus shifts from an aeronautical perspective to a mathematical perspective. From the viewpoint of CAA NL this might not be the best way forward, we have some hesitations and reservations with respect to this. Nuno Aghdassi adds that the EASA FDM forum have identified large amounts of data and confidentiality as issues. They are now considering whether it is possible to have operators using FDM to measure similar events and then share data on request instead of central storage with confidentiality issues and large data storage problems.

Abdoulaye n'Diaye notes that monitoring what is going on in the plane is one thing, but there will also be a lot of change from many stakeholders (e.g. SESAR). How do we monitor the total system? The problem might not be in the plane, but somewhere else e.g. at ATC. And the situation can even occur that both the data in the plane and the data at ATC indicate that both separately are correct, whereas they might not be correct when combined.

Jos Wilbrink notes (related to question 3) that ANSPs have some years of experience with SMSs, and they are cooperating.

3.12 Future work WP3

Heiko Udluft explains that WP3.3 will see the development of a software tool that embodies the risk models and representations of the accident scenarios as developed in WP3.2.

Rudi den Hertog asks whether the ASCOS team is going to run test trials for this tool, that is the only way to get good feedback on the questions posed in slides 32-34. Heiko Udluft responds that there will be test trials. ACTION 15

Keith Conradi states that having a wizard is a good idea. ACTION 16

Dieter Reisinger asks for an explanation how ASCOS is linked to CATS? Alfred Roelen explains that what is new in ASCOS w.r.t. CATS is the ability to incorporate future risks, and the ability to make the link with precursors. Dieter Reisinger mentions that in other groups there is a lot of discussion about the usage of bow tie models. Within CATS, Bayesian models seem to be used. Alfred Roelen answers that Bayesian networks were incorporated in the original version of CATS, however, within ASCOS Bayesian networks are avoided. The reason is that Bayesian networks are very complex and are regarded as a 'black box' by most people. One cannot use a black box in a certification process. But fault trees and event trees, which can be regarded as a bow tie, can obtain the same advantage. With a traditional bow tie there is only one event in the middle, within CATS and ASCOS there are multiple events in the middle, one can think of it as a multidimensional bow tie.

Lennaert Speijker recalls that EASA has an important user expectation regarding the tool as well. In a technical meeting between Lennaert Speijker and Rodrigo Priego (EASA) on 4 September 2013, EASA indicated that the tool should address future risks, should have a relation with the Areas of Change in FAST, and how this can

relate to the modelling of future risks in the extended version of CATS. During this meeting, an initial method to cope with this was established. Lennaert mentions that it was agreed with EASA that ASCOS will try to further develop this method within WP3.3 of the ASCOS project. Test cases could be part of WP4. ACTION 17

For timing reasons WP3.4 is skipped and not presented to the User Group Members.

Jean Pierre continues the presentation of future work in WP3, and explains that the main objective of WP3.5 is to develop a process to improve the total aviation system safety standards using lessons learned from experience.

Rudi den Hertog offers to send the extended reports on event finding and first occurrences to Monique Heiligers ACTION 18. Monique Heiligers will distribute these amongst the ASCOS partners and User Group members. ACTION 19

Abdoulaye n'Diaye points out that it is good to have a complete overview of all elements that do exist and do not exist (e.g. for ARP50 there is no ED, EUROCAE have developed guidelines for ground and ATM, these do not exist at ARP level). If ASCOS mentions all that exists, then it becomes clear where ASCOS can add value. Jean Pierre Heckmann agrees, but adds that it is necessary to know where ASCOS wants to go. Abdoulaye n'Diaye agrees, and states that this is the added value of ASCOS, the vision where to go. Lennaert Speijker responds that this will need follow up action in WP3. ACTION 20. Also Abdoulaye states that ASCOS WP3.5 should not only deal with the standards in the aircraft domain, but with standards in the other domains as well. ACTION 33. *Post meeting note: ASCOS WP3.5 deals with total aviation system safety standards. It is now planned to ask the involved partners in this task (APSYS, TR6, IoA/CAO) do deal with the different domains.*

3.13 Future Work WP4 – Alfred Roelen

Alfred Roelen explains the objectives of WP4: To apply the new certification approach in example case studies, to evaluate the practical application and to assess the overall safety impact of proposed safety enhancements. Within the case studies the focus needs to be on an improvement of safety, this is because of the goals set out in Vision2020 and the related funding of the ASCOS project. The topics of the case studies were already described in the ASCOS Description of Work, but these are not set in stone.

Dieter Reisinger asks why the ASCOS team is constructing case studies, trying to test the future system, rather than using a case study from the past and checking whether the new system would have come up with a different answer. Alfred Roelen acknowledges that this is a relevant question: the approach within ASCOS has to do with how the ASCOS proposal was written and accepted by the European Commission. Lennaert Speijker adds that ASCOS is a *research* project; one of the drivers is that there is a need to bring new systems or products, quicker through the certification process. The idea is to start some of these new developments already within the ASCOS project, as a start up of new technologies.

Dieter Reisinger responds that in his opinion the ASCOS team should look at case studies where data are already available, and the baseline situation is known and well understood. The case study can then demonstrate how much improvement can be achieved. When incorporating new technologies in the case

studies, data are not available, and the only way to really know whether it works is to wait for 30 years, and see what happens in reality. *Post meeting note: ASCOS will try to set up case studies where data is already available within the WP5 Validation. This will provide an independent means of validating ASCOS products.*

Abdoulaye n'Diaye adds that if there is a requirement regarding the ASCOS task, the ASCOS team needs to follow that. But Aboulaye n'Diaye agrees that somehow the method should be tested on a known case, for a baseline, to register the improvement. Take this approach for at least one case study.

Lennaert Speijker responds that - from a contract point of view - there is room for some flexibility, for example in case study 4.1, but for case study 4.4 there is less room for flexibility.

Keith Conradi mentions, from a practical point of view, that the case study should not focus on CFIT. This is because CFITs are virtually eliminated. Instead, focus on loss of control, which is very much related to the information presented to the pilot; this might be a useful case study.

Abdoulaye n'Diaye points out that it is good to perform the case studies within the context of the total Aviation framework, at a global level, encompassing SESAR, NextGen, etc.

Alfred Roelen mentions that he – and the WP4 partners – are looking forward to extending this discussion during the next three months, until the final selection of the case studies content by 1 January 2014. ACTION 21

3.14 Future Work WP5 – Monique Heiligers

Monique Heiligers gives the WP5 presentation on behalf of the WP5 leader Izaro Etxebarria. The difference between the verification, validation and certification process is explained. The focus of WP5 is on validation. To perform a good validation of the ASCOS products, the input from the User Group members is required. For this purpose a WP5 questionnaire is handed out to the User Group members, and will also be sent by email. ACTION 22. User Group members are kindly requested to fill in the questionnaire. ACTION 23

Jean-Pierre Heckmann comments that the definition used for validation on slide 3 is not the definition that is commonly used in relation to certification. Monique Heiligers proposes that Jean-Pierre Heckmann discusses this with Izaro Etxebarria. ACTION 24

3.15 Evaluation – Nuno Aghdassi

Nuno Aghdassi thanks all attendees for their contribution. The main points of discussion of this day are briefly summarised:

- The User Group members are asked to fill in the WP1 questionnaire to the best of their knowledge. There is a limited possibility to perform interviews instead of filling in the questionnaire.
- There is a consensus that the safety argument approach is a good way forward for WP1
- It is important to fully understand the framework in which ASCOS is set: a global total aviation system that is continuously changing.

- Issues were discussed related to data gathering/input: the use of simulator data, problems with proprietary data, unions, FOIA, and pro's and con's of FDM
- User expectations of the extended CATS model were discussed.
- The importance to have a good overview of what is already available and what not, in order to be able to pinpoint where ASCOS can add value.

The meeting is closed at 15.00hrs.

4 List of Actions

List of Actions			
#	Action Items	Responsible	Target date
1	Explore whether RPAS can be accommodated within one of the case studies. In case RPAS is included in the case studies, discuss the proposed change of the DoW with the EC	WP4, WP0	
2	Check whether the fact that the severity classifications within the ATM domain are changing has an effect on the analysis within WP1	WP1	
3	Compare the list of SPIs to the list with EC regulations for incident/accident reporting, and make sure that the SPIs do not result in an extension of this EC list.	WP2.3	
4	Refer correctly to all EUROCAE documents in ASCOS deliverables	All ASCOS members	
5	Obtain sample accident/incident data to test the continuous safety monitoring tools.	WP2.4	
6	Fill in WP1 questionnaire	All User Group members	
7	Have interview with (limited number) of user group members, as an alternative to filling in the WP1 questionnaire	WP1.3	
8	Provide guidance on writing safety arguments, including creating example arguments	WP1.3	
9	Develop content guidelines for the modules in the e-learning environment	WP1.4	
10	Information in e-learning environment must be ready before the start of the case studies	WP1.4	1 January 2014
11	Evaluate the material in the e-learning environment with the User Group members after 1 jan 2014	WP6	
12	From 1 jan 2014 until the end of the project an update mechanism needs to be in place for the contents of the e-learning environment,	WP6	
13	Dedicate a separate module in the e-learning environment to explain the total, global, changing framework in which ASCOS is set	WP1.4	
14	a high level view of which Flight Data Monitoring (FDM) inputs are necessary for a proper method of Continuous Safety Monitoring should be described in the WP2.3 document. It	WP2.3	

	should also describe what the output should preferably be, and whether it is possible to produce this output within ASCOS.		
15	Run test trials for the software tool developed in WP3.3.	WP3.3	
16	Use a wizard in the software tool developed in WP3.3	WP3.3	
17	The software tool developed in WP3.3 should address future risks, should have a relation with the Areas of Change in FAST, and how this can relate to the modelling of future risks in the extended version of CATS	WP3.3	
18	Send the extended reports on event finding and first occurrences to Monique Heiligers	Rudi den Hertog	
19	Distribute the extended reports on event finding and first occurrences amongst the ASCOS partners and User Group members	Monique Heiligers	
20	Construct a complete overview of all elements that do exist and do not exist (e.g. for ARP50 there is no ED, EUROCAE have developed guidelines for ground and ATM, these do not exist at ARP level).	WP3.5	
21	Extend the discussion with the user group members about the contents of the case study during the next three months, until the final selection of the case studies content	WP4	1 January 2014
22	Send WP5 questionnaire to User Group members by email	Monique Heiligers	
23	Fill in WP5 questionnaire	All User Group members	
24	Contact Izaro Etxebarria about the definition of ‘validation’ in relation to certification	Jean-Pierre Heckmann	