

SC186 WG-4
Minutes of Joint Meetings with WG-1 / EUROCAE WG51 SG-3 / ICAO SCRSP
October 2 – 4, 2001

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Papers

The documents referenced below are attached. Each document file name has a reference number and a preceding letter. The letters are E for EUROCAE, R for RTCA, and S for SCRSP.

Joint Meeting With SC186-WG1, EUROCAE WG51-SG3 October, 2, 3, 4 2001

1. Introduction

Paul Fontaine related the state of affairs in FAA. In the aftermath of September 11, there are critics popping up against ADS-B, and there is some concern that although the budget is stable for now, that ADS-B and other avionics related budget items may be cut and therefore projects delayed. There is also, however, a realization that system capacity issues will reappear after traffic normalizes, and there is a camp still supporting ADS-B and associated applications.

2. High level overview –

SC186 WG1 reviewed, at a high level, the applications that are being planned for inclusion in the ASA MASPS. These are enhanced visual approaches, enhanced visual acquisition, airport surface situational awareness, final approach and runway occupancy awareness, and conflict detection. Additionally “probe” applications, for which

requirements will be initially examined, include approach spacing, closely spaced parallel approaches, and conflict detection and resolution.

WG51 briefly reviewed 6 planned European applications (see document E04, slide 1).

3. PO –ASAS

See document E02 – PO-ASAS. PO-ASAS was jointly developed by FAA and Eurocontrol, and is a statement of principles of ASAS operation. The main thesis of the document is that air traffic services can be improved through more involvement of the flight crews in cooperation with controllers.

Rip Torn – on target level of safety – how are we defining what that is. Andy – we are trying to work with existing targets – when we go through the safety methodology there is a standard classification of hazards. In developing and allocating requirements to the equipment and procedures we are using the standard definition that the international aviation authorities are using. DO-264/ED78A is the framework that is in place for developing and implementing new systems.

Steve Koczko – PO-ASAS provides a good framework and definitions. Helps to define a common language. Perhaps the four application categories can help to point to required surveillance performance, or might help us form a basis to group applications for our “service levels

4. Terminology

We agreed to talk about terminology related to PO-ASAS, and agreed to cover other terminology issues after discussion of DO-264/ED78.

Assurance or assistance: These two terms were discussed in the context of “Airborne Separation Assurance” or “Airborne Separation Assistance.” Ken Carpenter noted that early in the development of ASAS the “A” referred to “assistance.” There is a significant difference in connotation – in one instance the system is just for help, and in the other it is implied that the pilot will take on significant additional responsibility. There are some camps that feel that “assurance” is a paper chase, that it doesn’t have any weight, and that it will move too slowly. There are others that feel that we are moving too fast. To try to make it clearer that ASAS encompasses a wide range of ideas, Ken feels that we need to retreat from a word that some people find objectionable because either it is too strong or too weak.

These points raised by Ken opened up an issue that WG4 had dealt with previously regarding changing the name of ASA. It was agreed later in the meeting that this would not be desirable.

ASAS application categories: There was a consensus in the group to adopt the four application categories described in the PO-ASAS document and to incorporate these four

categories in the ASA MASPS and our future work. These categories are: Situational awareness, spacing guidance, self-separation.

Glossary, definition of terms – We agreed that we need to list terms that need formal definition. Terms are to be identified through the course of the remainder of the meeting. It was also agreed later in the meeting that a subgroup will be formed to work on terminology and a glossary.

5. Work Matrices

Jonathan Hammer reviewed the WG4 task matrix. There was confusion resulting from the labeling of some applications with “probe.” It was agreed to add a column in the table to indicate analysis plans that would be headed “probe” or “full.” Jonathan took an *action* update the RTCA table with this column and to also update the dates in the table.

An *action* was taken to add a glossary term for “probe.”

Bob Darby asked whether the tables should also have a column or columns describing the level of validation and maturity of the application. It was pointed out that this is covered in the application descriptions. After further discussion it was agreed to address this issue at a later time if desired.

It was agreed to add the appropriate PO-ASAS category to the work matrix, i.e., situational awareness, spacing, self separation, etc.. Jonathan will take *action* to add columns to table – and send out for review.

We then went over EUROCAE paper E04 slide 2 containing the EUROCAE work matrix.

It was recognized that the EUROCAE schedule is longer term than the RTCA schedule and so the schedules will have to be further coordinated.

6. ED-78/DO-264

Philippe Caisso presented a briefing on ED-78 (briefing paper E12).

Application phases: Andy Zeitlin reassurance that through the methodology described, each hazard will be captured in an orderly manner. Andy was concerned, however, that some applications are not as structured and orderly as is shown in the briefing, e.g., visual acquisition. Specifically the phases may not necessarily be in strict sequence and there may be looping back though various phases.

Philippe agreed that it is quite difficult to agree on phasing, but Philippe believes that it is the best way to capture all the failure modes.

Terminology: After further discussion of additional terminology, Johnny Nilsson agreed to provide list of terms related to ADS-B (8 pages). Note: this information was provided prior to the close of the meeting, see paper E14.

Subgroup for Terminology: David Spencer, Andy Zeitlin, Eric Hoffman, and Bob Darby agreed to work as a subgroup to work on glossary definitions. The following terms were agreed to need definition by this group:

- operational hazard
- operational consequence
- Mitigation
- Avoidance
- Environmental factor
- Application phases.

Adoption of DO-264 for Separation Assurance: Dave Spencer raised a question regarding adopting do-264, the purpose of which was originally communications applications. Is there tailoring required for separation assurance applications? Philippe felt that the basic process is generally the same, although the group agreed that additional work is required.

7. Meeting and Conference Schedule

We agreed to hold joint meetings once every four months, or three times a year. Our next joint meeting will be during the first or second week of February in Europe. Bob Darby took an *action* to look for a meeting location, and also to see if there's a room available for the week prior for the ACM group to meet, and also for IOTA/NLR group to meet as well.

We agree to hold joint monthly teleconferences. WG4 will continue to hold bi-monthly teleconferences and semi-monthly meetings, to which all are invited. We agreed that we will attempt to hold a VTC during the semi-monthly meetings, depending on the availability of a VTC hookup at the meeting location.

The next joint teleconference will be held October 30. There will possibly be a joint VTC on November 14, during the next WG51 meeting.

8. Application descriptions presented by RTCA

We next began a detailed review of the applications that are being worked for ASA within RTCA and EUROCAE. The purpose of this discussion was to identify those applications that are similar enough to be possibly worked on jointly.

Randy Bone briefed the group on four major applications being worked on by RTCA.

Enhanced visual acquisition

Randy briefed the application from RTCA DO-259 .

OSD/ Application description format: During Randy's briefing, it was agreed that we need to agree on a common format for the OSD/ application description.

Call sign: Eric Hoffman commented that in Europe they do not want to use call sign. Johnny Nilsson commented that the call sign must be an absolutely unambiguous communication. Randy pointed out that the use of call sign is controversial in the US as well.

Non-CDTI based Operations: Dave Spencer asked if for analysis purposes we should analyze a non-CDTI based EVA? Randy said that the description includes only a CDTI. Jonathan pointed out that we should not be analyzing things that are not described in the WG1 documents. Eric H. was not aware of any work without a CDTI in Europe. The group's consensus was to proceed with CDTI based systems analysis.

Overall Objectives of the System: Johnny Nilsson commented that a mapping of overall system objectives needs to be articulated somewhere. The visual applications are only a means to an end. Bob Hilb: PO ASAS document does a good job of an initial mapping. Steve Koczko: perhaps the ASA MASPS could allude to overall goals (e.g., gate-to-gate). ASA could have a section that puts this all in perspective. This suggestion was accepted. (*Action* item for Steve and Jonathan, Nilsson to review the MASPS draft).

Anonymous ID: Johnny – is there still a need for anonymous id after 9/11. Bob Hilb felt that this desire still exists in the US.

Bob Darby – do we see any significant differences between what has been described and what we envisage in Europe? Eric H. – this is being considered but there is not a big push. Convincing airlines to equip for this is not likely. Bob Hilb – from US perspective enhanced visual acquisition will not get people to equip, but a combination of applications will entice the community to equip.

Bob D.: is the description really the same as what we are talking about. Eric H. – yes. Johnny – we call it ATSA – airborne traffic situational awareness.

Consensus was that the ATSA application is the same as enhanced visual acquisition conceptually but there is room for harmonization of terminology.

Enhanced approaches

Randy B. then went on to describe the RTCA application that is called “enhanced visual approaches.”

Documentation issues: Concern was expressed by Bob D. on being sure, given that DO-259 exists, that all the documentation of each application be able to be found in one place. How do we deal with changes? Jonathan suggested that we describe each

application in full in the ASA MASPS appendices, rather than reference changes to DO-259. Johnny N. pointed out that we need to make sure that:

- it is clear that the document supersedes the previous documents, and
- that our analysis is based on these and descriptions not others.

Flight Crew use of speed information: Questions were raised about the induced effects the approach flow of having speed information available to the flight crews. Randy – our expectation is that the additional information will help them make better judgements.

Bob D – is this a common application? The heart of the description is similar, but there are some differences such as phraseology, call sign. Eric H. – we need to agree on a common description. In general there was agreement that the application is very similar to applications being developed by EUROCAE.

ASSA & FAROA

Randy Bone briefed the surface applications from briefing paper R9. These applications are described in further detail in the appendices of paper R5.

Action item for glossary group: define “runway incursion.”

Potential Overlap with other committees: Daniel Ferro expressed concern regarding committee responsibilities and potential overlap with navigation maps, e.g., SC193, working on aerodrome mapping. Bob Hilb – we need to take responsibility for this until someone else does. Randy – looked at 193 document but there wasn’t enough there for our purposes and we had to move it along.

Steve Koczko – this points to the fact that ASA MASPS deals with a lot of system issues – need to pull in work done by other standards organizations, but we are winding up having to address a lot of things for the first time.

It was agreed that the surface applications are of common interest for EUROCAE and RTCA.

Approach Spacing

This application was agreed that it is of common interest. We will include this in our joint work.

9. Coordination

It was agreed that the RTCA applications subgroup, co-chaired by Randy Bone, would co-ordinate work on the application descriptions and OSEDs that are of common interest with EUROCAE. The following people from EUROCAE were identified to either represent or find a representative to support the application listed:

application	EUROCAE program	EUROCAE representative
EV acquisition	NUP phase II	Eric Vallauri
EV approach	NUP phase II	Daniel Ferro will take action to find a name
FAROA	NUP – surface extended visual acquisition	Johnny Nilsson will take action to find a NUP contact.
ASSA		Daniel Ferro to take action to find a contact
Approach spacing	Several European projects	Eric Hoffman will take action to find contacts

10. OSEDs presented by EUROCAE

EUROCAE representatives presented further details included in paper E4.

Airborne Spacing: Airborne spacing is similar but has some substantive differences as compared to RTCA’s approach spacing application. The motivation is different – airborne spacing is geared toward en route vs. approach, although it may be applied to both. Also RTCA’s approach spacing is geared specifically toward improving throughput at the runway threshold. The objective function of the control laws in RTCA are set up to achieve a specific predicted spacing at the runway threshold, whereas the EUROCAE objective appears to be to achieve a current spacing. We agreed that it is imperative to coordinate these applications and ultimately to merge them.

SEVA (Surface Enhanced Visual Acquisition): This application was determined to be largely equivalent to RTCA’s ASSA (Airborne Surface Situational Awareness). A NUP document has the detailed description – Bob D. took *action* to check on NUP SEVA document and forward to RTCA if available.

Airborne separation: We were a little confused between this application and the spacing application. The main difference appears to be between following a published trajectory (separation) and any trajectory (spacing) by the lead aircraft. We agreed that there are similarities with our approach spacing but we need to work through differences regarding time separation at the FAF vs. at the threshold.

In trail climb: (See also document E09). In EUROCAE’s version of this application there is a responsibility to maintain separation with both the lead and trail aircraft. In RTCA’s version in-trail climb is a pair-wise operation rather than the aircraft being responsible for separation in front and behind. Other than this the applications appear to be the same.

Application documentation: An action is noted for EUROCAE and RTCA to update their work matrices with specific document references.

Mediterranean free flight (MFF) – see paper E13: Johnny Nilsson presented paper E13 on the applications being worked for the MFF program. The most relevant application to possibly coordinate with RTCA is called ATSAW. We agreed that ATSAW was equivalent to Enhanced Visual Acquisition.

Most of the other applications were the same as presented earlier except for self-separation. MFF is working on this but there is no documentation as of yet – the first release of documentation is scheduled for early December.

11. Detailed Analysis Presentation of Approach Spacing Application

(Note that this agenda item was actually addressed after the joint meeting with SCRSP-ASAS).

Jonathan presented an analysis of the approach spacing application, see papers R06 and R07.

Comments:

- ACAS should be assumed to be not there when we discuss avoidance in ASAP.
- Avoidance and mitigation should be revisited in the table shown in slide.
- Questions were raised on whether separation violation should be at the top of the fault tree that was presented in paper R06.

Time ran out on the meeting after this presentation. EUROCAE agreed to provide a detailed briefing covering their analysis at our next joint teleconference.

This concludes the minutes for the Joint RTCA SC186 WG4/WG1 and EUROCAE WG51 SG3 meeting.

Joint meeting with EUROCAE WG51 AND ICAO SCRSP ASAS SG October 4, 2001

1. RSP

The discussions began with RSP. Jonathan Hammer reviewed work from WG4 on the ASSAP MOPS, which included preliminary definitions for RSP. Then Jonathan and Steve Koczko described the service level concept that is being developed by RTCA.

Steve guided the group through the key figures in the draft ASA MASPS. Ken Carpenter objects to the role of TCAS in the figures. Andy Z. described the need for merging data

on displays as well as coordination for applications that might need to inhibit some TCAS resolution advisories. We agreed to have a “row” about this later.

Bob Darby commented that EUROCAE sees a need for a capability to fuse ads-b and ground radar data. This might be related to TIS-B, and Andy Z. agreed.

Use of language – it was noted that the ICAO OPLINK panel uses the same “service level” language. Service level should also be added to the glossary (action for glossary group). Andy Zeitlin took action to coordinate with op-link FAA panel member.

2. ASAS SG and SCRSP rôle

Ken Carpenter explained the roles of various ICAO panels. The surveillance and conflict resolution panel’s (SCRSP) purview is all matters surveillance. Conflict resolution is intended to encompass ACAS and ASAS. SCRSP is to review and develop technical and operational procedures for ASAS. SCRSP’s terms of reference give them formal permission to do anything, in practice the real world isn’t that easy.

SCRSP has two working groups – surveillance, and WGA. WGA now does ACAS and ASAS, Ken is representing the ASAS subgroup. The ASAS subgroup’s interest is in all matters relating to ASAS. The group needs to bring forward appropriate material to ICAO and to be aware of and promulgate appropriate standards. This, however, won’t be the panel that promulgates changes in phraseology. The group will be concentrating on procedures and technical requirements.

The question was raised as to whether WGB will concentrate on ground requirements? Ken said that it may work out that way but not necessarily.

Andy Z. commented that it is appropriate for the ASAS SG to decide and determine what sorts of documents it expects to produce next.

3. ASAS SG Activities.

Next week the ASAS subgroup’s proposed program goes to SCRSP WGA. The proposed program addresses their plans before the first panel meeting in 2003. The plan includes four deliverables:

1. Complete ASAS circular.
2. Complete a statement of concept of RSP for ASAS. Formulate text that might appear in an ASAS manual and further downstream in an ASAS SARPS.
3. Report to ICAO and ANC on ASAS developments and ASAS applications. Will write a paper describing the applications. Andy Z.– might expand this paper to include paper describing the maturity of the applications, including operational evaluations, safety studies, simulation studies.
4. Write a paper that advises ICAO of what papers they might have to produce to support ASAS, e.g., technical SARPS for ASAS systems.

Bob Darby – we should consider the working methods to assure that there is common understanding of material etc. This could be as simple as a list of common members of both groups. Ken – we should not forget the role of the other panels that have a clear and obvious role to play. ATCMP, SAS, OPLINK. Need to have WG1/WG4 feed through these panels.

Ken's question – who in ICAO provides the rubber stamp that our methods of analysis are o.k.? The answer is "no one." Seeking to get approval for the methods in advance, would be a waste of time. Anything bearing on the safety questions should go to the SAS panel and SCRSP.

Jonathan H. & Steve K. asked for help in getting the right contacts from the ICAO panels and establishing that coordination. Andy suggested getting a list of FAA panel members. Ken C. – need to coordinate at the working group level and the working groups follow an informal process. Need to know who are the active panel members. The route to those is most often through their advisories. Andy Z. – we can begin to pursue this through Gene Wong.

Ken offered to coordinate the introduction of material to the appropriate ICAO panels. There is no barrier for RTCA and EUROCAE to feed any information to the ASAS subgroup. ASAS can forward stuff to the other appropriate panels.

4. ASAS circular

Comments from other panels: Ken went through comments from other panels on the ASAS circular. The main concerns from the other panels are that ASAS is going too fast.

ASAS circular and PO-ASAS coordination: The ASAS SG will review PO-ASAS and incorporate the ideas and terminology as they see fit. The PO-ASAS is a more mature document and the ASAS SG is likely to give ground.

5. ASA name

The subject of changing the ASA name was discussed.

Ken C. -- ASAS was coined as a word by SICASP – there is no chance of changing this in ICAO. Steve K. – in light of Ken's comments we really shouldn't change the name.

Hilb – from WG1 perspective we just need to work on good explanations in our documents and make sure that people have a good understanding of what it is we're talking about.

The consensus of the four groups was to keep the ASA name.

5. Further Business -- Comments from ASAS SG on WG4 meeting minutes and documentation

Comment 1: Ken C. told us that there is inconsistent use of the term application in our documents and notes. ACM and CD are not applications. The ASAS SG refers to an application as an operational procedure. The ASAS SG, would prefer to say that ACM is a tool used to support a number of applications.

Andy Z. – an application may encompass more than procedures, and could encompass equipment and technical features. Some applications may have a defined beginning and end, and some applications are ongoing.

Ken would be happy with a statement that ACM is an application of ADS-B. Besides the question of language / semantics, there's a risk that a distinction is not being made between the tool itself and the application.

Andy Z. – a new set of names may be needed to put the ACM applications in the same form as other applications.

Steve Koczo – applications are the end-user processing that makes use of ADS-B data. ASAS is the all encompassing term. PO-ASAS offers four well delineated categories.

Another concern – ACM and CD are only tools. A satisfactory tool would not by itself make for an acceptable operation or procedure.

Jonathan H. -- we need to associate the specific procedures that we are trying to investigate in association with the ACM and CD tools. Steve K. – need to have a term that reflects the computer processing in conjunction with procedures. Bob Darby – need to describe what the system is being used for and why it is being used.

Action – application needs to be clearly defined by the glossary subgroup.

Steve – we're in full agreement with what Ken has said, wg4 views our applications in the larger context of the procedures & tools.

Comment 2 – Ken Carpenter: Concern expressed by the ASAS SG that the proposed RTCA / EUROCAE safety work might not be sufficient. A simple fault tree analysis is probably not sufficient. The expectation is that the conflict avoidance will probably be more complex than TCAS, for which a detailed Monte-Carlo analysis was performed.

Jonathan – the fault trees are the start of the analysis, many of the leaves will require more complex work. From one point of view, this is the same approach as was taken for TCAS. We do expect that the level of effort involved will be substantial for each application, and that more than just a fault-tree analysis is required.

Comment 3 – on Tony Warren’s tubes in space. Believe this is probably unworkable based on prior experience. Jonathan took *action* to forward this comment to Tony.

Andy Z. forwarded comments from ASAS SG to WG4 for further consideration.

This concludes the minutes for the joint meeting between SCRSP-ASAS, SC186-WG4/WG1, and EUROCAE WG51.

**Minutes of the WG4 Teleconference
October 3, 2001**

The subject teleconference was convened during a two hour break in the VTC on October 3.

The agenda was to review the WG1 application description for Conflict Detection (paper R10).

The document was reviewed by Martin Eby. The primary focus of the discussion centered on the focus of our two contracts for the CD&R probe analysis, under contract to Rockwell Collins, and the CD analysis that will most likely be undertaken by UPSAT.

The conclusion of the discussion was that a teleconference between the contractors and the safe-flight 21 office should be arranged during the next week to try to coordinate these contracts and make sure that they are complimentary and do not overlap.