

PASS Principle of Active System Safety

Airbus Headquarter, Toulouse, 29 March 2006 8.30 - 13.55

Structure of the meeting. Form - intensive discussion with debates about almost every sentence and every slide. Every slide was challenged and meaning was chased. The idea, I believe, was to show that Airbus safety specialists understand the subject and probably because bigger Airbus bosses advised safety experts to pay attention - some kind of competition and therefore inside experts might be damaged in terms of reputation and safety concepts Airbus perceives...



It took 1.50 hours (the period of the meeting see above) to explain that PASS is not about to replace existing safety schemes (actually it is) but to adjust with existing Airbus system...

Airbus HQ



Well, NIH (non-invented here) syndrome is well known not only in England...

Activeness of safety in Airbus is provided by ... human, after flight... They investigate every accident /incident every week and try to analyze the reasons to make decisions about reasons of incidents if possible. Naturally accidents they investigate much more intensive but again using human expertise instead of tools and software...

Some general notes:

- Active Safety... At first they DO NOT HAVE IT and NEVER HEARD. Airbus safety approach is about "killing probabilities" - i.e. when there is spotted (again spotted, too late) chance to cause the safety threshold violation they try to make decision to stop absolutely the reason of the case, by triplication of doubled pairs of the systems, if it is about hardware; In this case it is active safety approach, but well after flight and without any actions during the flight.

- Airbus noted that they are aware that NASA and Boeing are doing mechanistic safety improvement, by updating regulations and investigating the reasons and if possible introduction of special hardware to address the reasons. They have an extremely conservative approach to aviation safety. It was some kind of testimony to Airbus's resistance to change... Looks familiar.

- Active System Safety is absolutely new for Airbus and they want to know more. It was agreed that D1.1. And D1.2 will be delivered to them after signing Non-Disclosure Agreement. In turn I was shown their confidential reports about safety approach in Airbus. I am not impressed. We are better as rigorous approach is giving us transparent scheme what can influence on what and thus investigate possible problems and solutions AT THE SAME TIME and in REAL TIME OF FLIGHT.

Anyway when level of trust was finally achieved (after 2hr debates...) and Airbus specialists were interested to start intensive information exchange and express an interest to participate ONBASS!!! meetings.

- Fault Tolerance. Surprisingly Airbus is well aware about Fault Tolerance and not impressed with Thompson, Thalys, SGT and TIMA solutions (bigger brother of IROC) solutions - they asked about something new and systematic. Briefly - only for JP Daniel it was mentioned D1.3 and interest to have a look was immediate.

Confidentiality. JPD did show me his commercially secret presentation on behalf and for Airbus about system safety and it was agreed that we send each other presentations with NDA. Copy of my presentation WAS NOT GIVEN.

- Organizational Aspect. It was pointed out that Airbus is interested in collaboration. They tried to set network of excellence with York and Cranfield Universities. Based on my knowledge this proposal failed. Some other companies such as DLR and NLR were also mentioned. After open exchange of opinions let say SWOT analysis JPD expressed a desire to start proper network of excellence with us.

My idea to start a serious safety project with leading role of Airbus as a partner was rejected as it was noted that risk for Airbus to step in full is high, besides accordingly EU regulations Airbus could not be leader of the project as it will be violation of FP principles - one company especially big should not be direct beneficiary from the project funded by EU.. I have heard about this before. We can do new network of excellence I prefer to call it American way Think Tank of Aviation Active System Safety (TTAASS, or T₂A₂S₂).

Future steps immediately to prepare and send a copy of D1.1, D1.2, D1.3 to Airbus probably with comments of strategic economic analysis. After NDA is signed.

ONBASS. Leaflets were distributed (20+) and comments on every partner were given, ETG GA avionic devices, ETH, that we are using Oberon and nee OS believe it is good option; RA as industrial partner with expertise in risk, safety critical aspects, Oration as aviation maintenance expertise and publicity. Comments on IROC were not needed (see above) Airbus opinion on “Grenoble Silicon Walley” is known and also I am not promoting research of 2nd year student coursework level within ONBASS. General aviation is booming in US and expected to be blown in size in Europe – see Wall Street column straight below:



EU role and people I did mentioned JLM several times and his advise in Grenoble to contact Eurocontrol, European Aviation Safety Agency and warning about Finmeccanica.attempt to start similar project.



Finmeccanica activeness is explained, I believe by recent publication in Wall Street Journal (again, see below). JLM told me that Airbus engineering is outstanding but we should use *small step* approach to promote Active Safety there. He was right. Airbus JPD noted my high evaluation of JLM expertise and his USP as Eurocontrol and DG Research wise and promised to communicate with him to discuss possible collaboration in the aviation safety area. Also Airbus specialists have similar opinion with JLM about Finmeccanica.

Reaction on PASS from Airbus is: it is knowledge based system safety with elements of artificial intelligence. It is actually not. It is application of computer science and principles of information processing with extension of theory of fault tolerance to safety to achieve rigorously required safety level actively, especially

using RT features. But I am afraid it was too much for one presentation... And I prefer to use our natural intelligence...

Reaction on Conditional Maintenance was ... panic. They actually use conditional maintenance for their analysis of safety (availability) level as it is described on our one of the first figure in Chapter 6, Deliverable 1.2. But we have the whole chapter to prove that it is actually not good enough and development mentioned is required. Airbus *wanna* know more here.

Reaction on Life Cycle aspect: Airbus delegates the role of safety management to avia companies (not like Boeing when they try to do Boeing inspections of safety management in avia companies). Pointed out though that maintenance of aircraft in terms of PASS might be reduced at least one third - my estimation was based on ¼. (using simulation in D1.2), so we are even better.

Meeting in general. The end of meeting was quite friendly especially when all colleagues left and we talk to JPD nose to nose. It was found that we have common colleagues in USA (Boeing Head of Safety John Dalton) and Tom O'Kane from British Airways (ONBASS independent expert!). Meeting was interrupted by security as JPD told that we better complete everything possible before 1pm as Huan Carlos, King of Spain visit is expected to be there at 2pm.

Strategic comment. To succeed in the strategic projects It should be made legally binding commitment to active system safety approach and devices if and when ones are invented, with advanced purchasing commitment - (similar to futures) but without too much commercialization, as SAFETY IS A PRIMARY DUTY AND OBLIGATION. Obligations from society should be made long before invention will be feasible. This might cause paradigm shift in the minds of top European politicians and European and National Funding institutions and thus harmonize development of strategic programs, such as Active System Safety seems to become...

Personal opinion. I did not loose in Toulouse. It is always nice to be proved right, but NIH is quite strong and personal ambitions can ruin everything... we are so good in using of objective reasons to perceive subjective goals... And it is true not only for Airbus...

Fig 3. Easiest part of the trip - don't be surprised with the size of the meal - Londonmet travel regulations and senior lecturer salary combined keep me fit!



Igor