

## EPISODE 3

- **What type of expertise is required to solve the hot topics**
  - The hot topics are identified mainly in the expert groups and within the team detailing the concept. The expertise required to solve the hot topics, is essentially the same, but a decision mechanism must exist to close the issue. This decision mechanism should rely on a stakeholders group that has the power to decide when several solutions to detail the concept exist. Such a group could not be created in Episode 3, as it was being set up in SESAR and duplication of such groups was not wanted.
- **Why changing from OSED to DOD?**
  - Initially Episode 3 intended to produce OSED's. However, when we started looking at the concept, we realised that it was not mature enough to provide the information required in the OSED template we had developed. Therefore we chose to create a new document type called DOD, inspired from OSED, but tuned to collect the kind of details we were able to provide at this stage of maturity.
- **EP3 used a lot of techniques and combined them. Are there any experience / considerations about cost efficiencies?**
  - Not yet, but we intend to provide this information in the final report, i.e. costs of deploying the techniques used.
- **There is experience with gaming now. The objective of gaming was, as I understand, that it should lead to decision making in controversial processes. Is there any view that gaming may lead for example to acceptance of a controversial difference of interests between some airlines in the fair negotiation on conflicts of interest?**
  - First of all, just for clarification, the gaming scope is focused on assessment of processes feasibility where the showstoppers and bottlenecks are detected. One of them is the conflict of interests between airlines. For that, using gaming techniques, the need of predefined indicators to solve these situations has been identified. Equity indicators (such as degree of SBTs affection, historical SBTs distortions,...) are key indicators to support the decision making in an equitable way. Furthermore, a new role/function was identified (the Airline Coordinator) as a mediator of users' interests. All these solutions to solve the decision making in controversial processes have been already detected through this gaming technique, and therefore its proven usability.
- **There is a trade-off between capacity and efficiency. Increase of demand may require maximising deployment of available capacity (e.g. Heathrow), but climate crisis and scarcity of resources may require a shift towards efficiency/environment, deploying preferably less than the maximum capacity. What is SESAR doing to position adequately to a moving world scenario?**
  - This should be handled through revision of the ATM master plans, where ultimately the high term goals may be re-evaluated.
- **How do we validate behaviour/processes in an asynchronous environment?**
  - Episode 3 used a tool called PROMAS which is able to model processes involving multiple actors, and obtain measurements. Asynchronous processes can also be modelled in PROMAS by creating processes cycling and waiting for

a particular condition to occur. However, we have only used PROMAS inside Episode 3 on synchronous series of processes.

## CAATS II

- **Is the Business Case the one coordinating all cases or a case like the others? If the latter, who supervises, coordinates, handles differences and ensures coherency and consistency between the cases?**
  - The Business Case is a structured way to prepare the required evidence for decision-makers (stakeholders) on the advantages and disadvantages of the different concepts under consideration. It represents an overarching position relative to the other cases: it brings them together, balancing the positive and negative aspects of each, and presents the underlying economic assessment to enable decision makers to make informed trade-offs. A Business Case is therefore a collaborative process involving a multi-disciplinary team aiming to ensure the ownership and buy-in of all stakeholders.
- **How and when do you involve the regulator in the E-OCVM?**
  - The stakeholders identification and the way you address them are some of the first validation steps to be taken. The regulator, being an important stakeholder, should be involved during the very first phases on the lifecycle model. As current safety regulations may stand in the way of healthy, safe operational improvements, safety regulations need to be addressed in an early stage of safety case development. It is noted that version 3 of the E-OCVM will also introduce a dedicated Standardisation & Regulation case.
- **Case based presentations are repetitive. Could we get a clarification on specificity (i.e. more concrete description of indicators, criteria) of each case (if any)?**
  - Please refer to the CAATS II Deliverables for detailed information. (<http://www.caats2.isdefe.es/> - Documentation)
- **Is it the objective to create a case per KPA?**
  - The 11 KPAs represent those key aspects of concept performance in which stakeholders are generally interested. Even in a project that aims to improve just one KPA (e.g., capacity), each of the other KPAs will be usually of interest to one or more stakeholders. It should then for example be validated that performance on those other KPAs is not negatively affected. The cases should thus provide coherent evidence across all KPAs, with the balance of emphasis between different KPAs reflecting their importance to the stakeholders. The division into separate cases is mainly driven by the need for different specialist disciplines, some of which relate strongly to a single KPA (like Safety) while others span many KPAs (like Human Factors).
  - CAATS II focussed on developing guidelines for four cases (Safety, Human Factors, Environment and Business) which will be, along with the separately developed Standardisation & Regulation case, included in version 3 of the E-OCVM. Although more case guidelines should be developed (e.g. security) CAATS II did identify that the concept performance with respect to all KPAs should at least be taken into account in the business case, irrespective of whether those other KPAs are addressed in a specific case.

- **The SESAR JU presentation emphasises system development. CAATS is about concept development. Why was the link between the two not properly addressed?**
  - System development requires the conjunctive execution of many activities such as requirements management, concept development, concept validation, verification, development of a performance framework, etc. The interplay of these activities needs to be established depending on the specific system development strategy (e.g. that of SESAR), and were outside the scope of CAATS II.
  
- **Who are the actors involved in each of the processes? Who is the customer, i.e. where do the requirements come from? Requirements in general, seem to not have been addressed well enough.**
  - The European ATM system is not owned by a single 'customer', so incremental changes to it (which is how ATM concepts are implemented) can not have a single 'customer' either. Customers funding specific developments that result from a concept will have 'Requirements' for what is to be implemented, and those requirements will take account of the needs, constraints and compromises emerging from the earlier phases of the concept validation process..
  
- **The life cycle can be used with different scopes depending on the research topic. Did you think about this when describing the cases? Or did you concentrate on SESAR as the scope (which could stretch the timeframe from V1 to V3 enormously)?**
  - As the E-OCVM, CAATS II focused on the phases V1 to V3. and the case guidance is intended to be scalable to support a wide range of validation activities from small-scale projects to large ATM system development programmes like SESAR. This implies that it should be interpreted to particular activities in their particular scopes.
  
- **Are guidelines available how to tailor (apply) the cases in SJU projects?**
  - There are no specific guidelines for SJU projects. Nevertheless, CAATS II guidance material was developed in close cooperation with the SESAR JU (as main customer), and with focus on application in SESAR-emerging projects.
  
- **Is there any indication of how much effort is needed to conduct a Human Factors case (on average)? Are there any experiences with this methodology in this area?**
  - There is no 'standard' cost of a Human Factors case – it all depends on the extent of people-related risk and opportunity associated with the concept. Early work to scope and understand the issues need not be expensive, and can be very effective, provided it is done by people with the right understanding, and is properly integrated with concept development. Once the issues are understood, the amount of work needed to address them can be assessed and prioritised along with other work needed to develop and reduce the risk of a concept..
  
- **Is it possible to link safety analysis to security analysis and meet the [emerging] guidance/standards? If not, we might be spending the same money twice!**
  - CAATS II focused on the development of guidelines for four cases, and "security" was not one of them. However, the guidelines on 'relations between cases', which was also defined during CAATS II, are generic and therefore also valid for links between the safety case and the security cases. It is indeed a good idea to

consider in further detail how the safety and security cases can optimally benefit from each other, but – again – that was outside the scope of CAATS II.

- **Can we show what happens to the behaviours of the system under failure conditions, especially multiple failures caused by e.g. terrorist attack?**
  - Validation is about demonstrating that a concept is fit for purpose. There will be a range of 'normal' and 'exceptional' situations that may need testing to establish this fitness for purpose and using a Safety (or Security) Case is a way of identifying such situations. This should be done as early as in V2 of the lifecycle model, where the feasibility of a valid concept depends on whether these issues can be properly mitigated. It is even recommended to start the safety analysis already in V1, in order to avoid spending time and money in V2 on concepts that will eventually not turn out to be valid.
  
- **Is it possible to scale analysis techniques to cover the whole of SESAR in order to feed evidence into the "planned macro safety case"? How would these techniques cope with change during the design/development phase, through roll-out [whilst interfacing with legacy ATM] through the next 50+ years?**
  - SESAR indeed identified this need for a 'macro safety case', next to several other emerging needs for safety case development for advanced concepts in R&D. We have identified existing and emerging approaches to satisfy these needs. Many analysis techniques may be suitable in multiple phases, but the integration of these techniques so far is limited.
  - For dealing with changes in concepts, it is of major interest to document exactly for which concept versions which evidence has been derived, and that these should be re-interpreted for different concept versions.
  
- **Who is the "Gate keeper" and how independent are they?**
  - The "Gate keeper" is the decision maker. They are those who are responsible to take decisions based on facts and evidence. They should be first sufficiently independent not to be biased, but on the other hand, they should have sufficient knowledge about the concept and the activities carried out to impartially decide about the go or no-go decision.

## **SESAR JU**

- Many of the concepts & techniques developed / used in CAATS II and Episode 3 will be useful for specific projects within SESAR. How is the SJU planning to support the projects in education and use of these techniques?
  - There will be some mechanisms and arrangement within the SESAR Work Programme that will be dedicated to training and education in the usage of such tools.