> Remark: our Stakeholders may not be ready to move away from textual requirements to model-based; it will take time to convince our customers once our engineering processes are stabilised and proven to be efficient.

Agree, that is why we will need both for now. There are some studies that try to generate textual requirements automatically from diagrams/models but the result tends to be hardly human-understandable. I think a good first step would be to synchronise requirements and the rest of the model. For example, if a requirement mentions a function, the requirement text should be automatically updated when the function name is modified.

> Have you defined the complexity of the diagrams in the MBSE Fw, rather than textual requirements have to be specific and broad. How can this be performed in diagrams?

As mentioned in the previous question, we have some constraints that will make us stick with textual requirements for some time (lack of MBSE culture, legal aspects…). The advantage of diagrams is that they can replace several requirements at once and, if the diagram becomes too complex it can be separated in two or more diagrams while maintaining the coherency among them.

>In the abstract it is mention the concern about consistency and correctness of the models. How do you plan to ensure both within the solution presented? Thanks!

The MBSE tool guarantees a certain level of correctness by proposing a limited set of systems engineering concepts that can be used (functions, components, scenarios…) as well as the traceability between them. A second level of validation can be done by using checks on the model (sometimes called validation rules). An ITT will be launched shortly for developing an AI-powered digital assistant that will be able to check system models based on previous designs.

> If you use a profile it is not standard any more. Are you planning to standardize it? Do you have a commitment from your suppliers to use it? Who is going to pay to maintain the profile in the tools?

Today there is no standard profile for space systems engineering. The goal of this activity is to create one for ESA projects (modelling done by ESA team). The suppliers will continue to use they own MBSE approaches and the interoperability will be provided by the Space System Ontology and the MBE Hub. The cost is divided between R&D activities budget and the projects that use the approach.

>Is there no simplification possible in ECSS when moving to MBSE instead of just mapping one to the other ?

Good question. Some aspects of ECSS could probably be changed since they were developed with a document-based approach in mind. Other than that, ECSS (E-ST-10 branch) describes a systems engineering process to which today everyone has to be compliant with, so that is why we took these documents as inputs. The analysis of these documents has allowed us to identify inconsistencies and other issues on the documents that have already been reported to ECSS.

>What about using part of the models as requirements ?

In the framework, you can see that we call them ‘textual requirements’. This is because every diagram or model elements may be considered as a requirement/specification, being textual requirements just a particular case of requirement.

>It would be possible to access to the ESA SysML profile? It would be possible to use it?

Yes, please send me an email to alberto.gonzalez.fernandez@esa.int. For people outside of ESA, this should be possible once we select the appropriate distribution license.