Systems Engineering individual questionnaire

Explain the significance of the 6 stages of the INCOSE process from Concept to Retirement. (800 characters)

6 Stages of INCOSE process contains technical and management activities. Those stages describe generic life cycle model of a project. Everything starts in concept definition stage where are mostly management tasks. Stakeholders needs to agree on need of change. Next one is System definition stage where all stakeholders' requirements and business needs are well defined and technical plan and architecture can be done. System realization begins when architecture and feasibility evidence are low risk to committing resources. Production, support and utilization stages starts when stakeholders put resources to produce and support the system for its expected lifetime. When system become obsolete or not economically supportive, it moves to retirement stage.

How does MBSE support carrying out trade studies? (400 characters)

Model based system Engineering contains model like Analytical, which uses mathematical relationships such as equation to support analysis about the system. Those equations can be used, also in trade studies where we can write definition of trade study problem from those equations. In definition we are looking for set of variables that best satisfy measurements.

Why is it important to ensure traceability from needs down to the features of the solution? (400 characters)

It saves time, money a and effort. If tracing is done properly, we can easily track solutions back to business needs so we know why we are doing it to get better background of the problem. And reversed for example on change requests in needs or requirements we can easily determine what everything will be affected. Companies can waste a lot of money on repeated research or tracing affected parts of solution for changes.

Discuss the different model abstraction techniques and their benefit and drawbacks? (400 characters)

Interval abstraction is simple to use, its proven in many practical applications but is coarse. This means its not specified how signal values may evolve over time.
Gradient-based interval – Similar to interval but signal value can "evolve" over a time.
Those interval-based models can be too static or too coarse. In this case we can apply adaptive interval abstraction with specific properties.

Describe the process we followed in class that uses Overture to generate an FMU. Mention the import and the export phases. (400 characters)

Overture IDE does not come with build in FMU-export plugin this, it had to be added manually. In new project we import all our Model description xml files. Then we need to add controller class and make it as object in World class which works as a main. Executing co-simulation and

complete model. Now using overture FMU we can export FMU. This will create generated folder which will contain our FMU file.