

SUMMARY

The scope of the thesis was to map necessary prerequisites, stakeholders' requirements, environmental and weather variables to create validation plan for waypoint navigation subsystem of unmanned ground system dedicated for forestry operations – cleaning and regeneration.

To create validation plan for subsystem, it is necessary to familiarise oneself with desired complete system. In this thesis the focus was on autonomy package, but complete system of systems sets certain requirements that cannot be understood with bare analysis of the subsystem. Analysing the UGS consisting of mobility platform, autonomy package, forestry specific operational payloads and proposed service phases architecture gave the full spectrum of requirements and constraints to forming the validation plan.

The basis for creating the validation actions, procedures, strategy and plan was taken from the Vee Model sequential life cycle process. The continuous in-process validation forces developer to consider connections between different subsystems forming a complete system throughout the whole life cycle of developed product. Analysing the stakeholders' necessities to the product it was crucial to map and define environmental and weather variables of the operational usage scenarios with industry representatives and experts.

In close cooperation with multiple end users and industry experts the high-level operational requirements were mapped and defined. The key element in developing useful and efficient system is two-way communication between development team and stakeholders throughout the lifecycle of the product. Defined functional and performance requirements must be understood identically among all parties involved in process. Otherwise the outcome of the development is not usable in industry specific operations and areas.

The validation plan was created under supervision of UGS development team from Milrem AS to assure usability and correctness of the validation procedures. All requirements stated in this thesis were turned into executable validation actions and acceptance criteria was confirmed with stakeholders. Created example of validation traceability matrix can be used in real life validation process.