

Master Thesis - “Development of Concepts for Automated and Optimized Cutting Tool Management”

(30 credits/20 weeks – 2 students)

Project Background

The manufacturing of jet engine components include metal cutting as one of the most common and time consuming operations. As the materials are very tough, and quality demands are extremely high, the amount of different cutting tools are very high and the tool wear is extremely high which require frequent tool changes (tool inserts as well as solid tools). This is both time consuming and costly, and the availability of tools in the machines are critical to the availability of the machines. Thus, the overall logistics of tool changes are important for high productivity and cost. There have been some different studies and proof of concepts for automated tool handling, using industrial robots and automated transport solutions. This looks promising, but the solutions need to be further studied from a more holistic perspective, to see the full impact on the production performance and business case.

The task for the thesis work is to make such a study, to identify the opportunities and gaps that need to be addressed in further technical development work for a future automated tool handling system. This system should be integrated with the production planning to optimize production performance.

Further, the assignment offers a unique opportunity to work in a creative environment, supervised by the Global Technology Centre at GKN Aerospace in Trollhättan. The work will need a cross functional approach together with different departments in manufacturing operations.

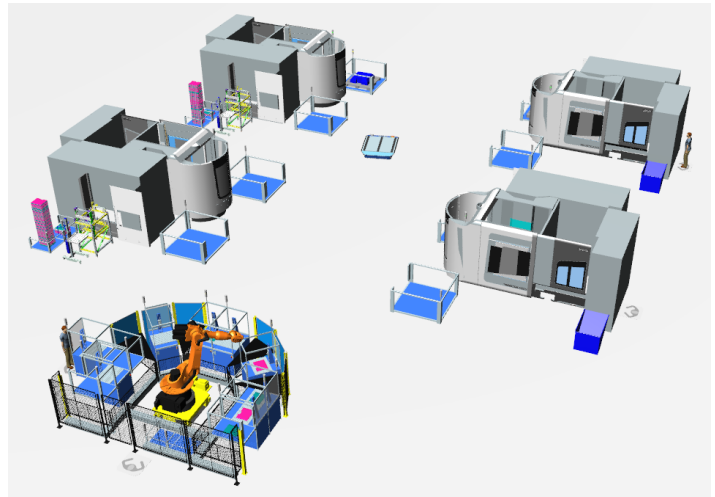


Figure: Concept of automated tool handling system.

Assignment Description

- Familiarize with the topic
- Current state mapping of tool management and production planning
- Define relevant KPIs
- Develop new concepts for automated tool handling
- Develop a realistic scope and model(s) for simulations of the concepts
- Test and analyze different scenarios
- Identify gaps and opportunities for future implementation and technical development of the concepts
- KPI and business case calculations and analysis
- Document and present results

Qualifications

Student in the final year of their M.Sc. studies in the field of Production Systems, Logistics, Industrial Engineering and Management or similar with a strong interest in simulation and other data analytical tools.

Contact

GKN Aerospace: Johan Vallhagen, Johan.vallhagen@gknaerospace.com; Ana Bonilla, ana.bonilla@gknaerospace.com

Last date for application: 2022-12-20. Interviews will be held continuously and the position could be filled prior to the last application date.