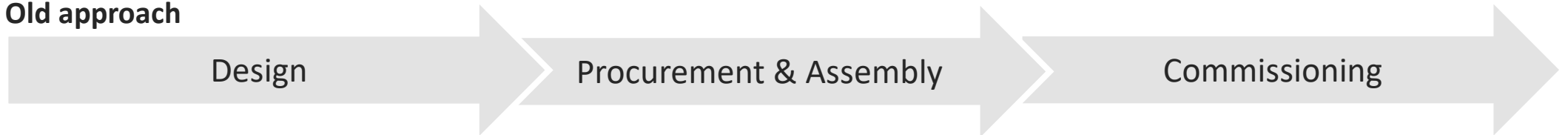




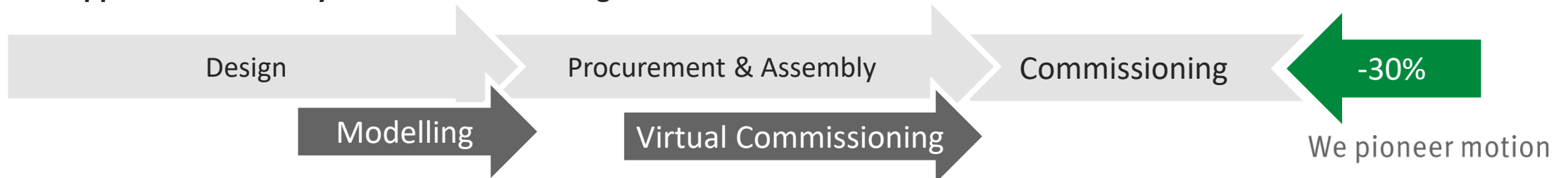
Virtual Commissioning

... is the validation of PLC, HMI and Robotics in an earlier and less critical stage of the project by using a simulation model.

Old approach



New approach enabled by virtual commissioning



Virtual Commissioning

Customer benefit

- » Reduce investment costs
- » Higher software quality in an earlier stage of the project
→ **Achieve target OEE faster**
- » Reduce production downtimes for changes

Competitive Advantages

- » Reduced lead time for production equipment
- » Digital pre-acceptance
- » Virtual training for production

Software Stack

SCHAEFFLER



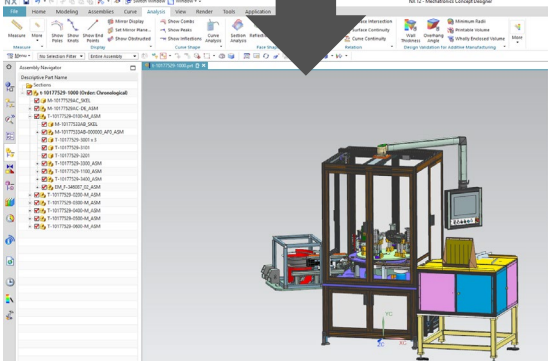
Robotic Controller

HIL

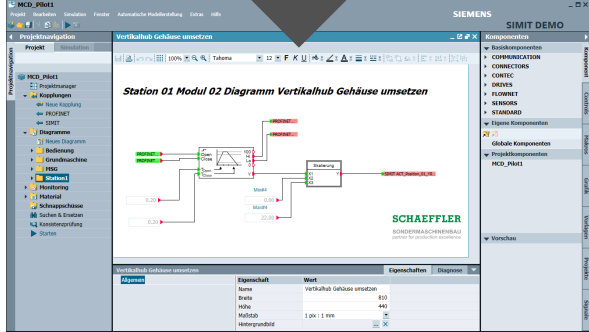
SIL



PLC



Visualization

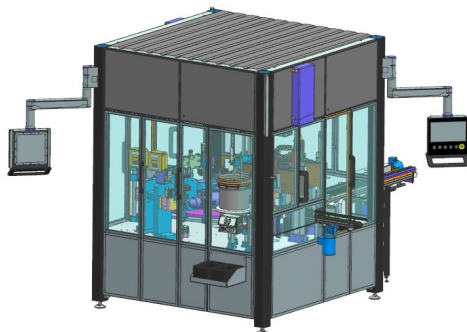


Behavioral Models



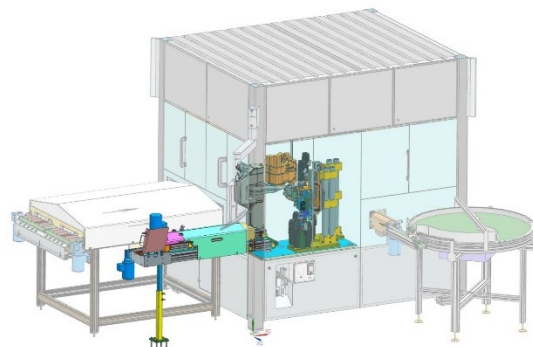
Project Portfolio

RSTM Assembly Line



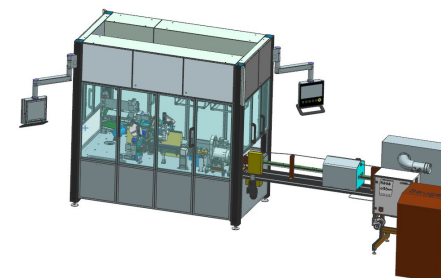
- » Re-build with new features
- » Complete test of PLC and HMI
- » Additional station with unknown drive system

EVCT



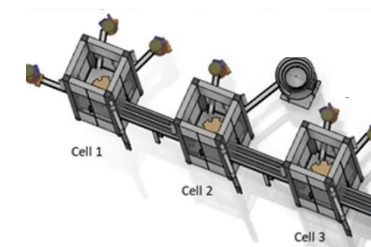
- » Existing machine in production with a new robot
- » Partly test of PLC, HMI and robotic
- » Positioning of robot due to a reachability analysis

Eddy Current Test Cell



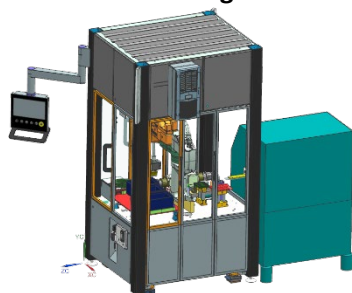
- » New machine with new type of measurement equipment
- » Complete test of PLC, HMI and cam drive
- » Challenge: extremely low cycle time (240 parts per minute)

Assembly line



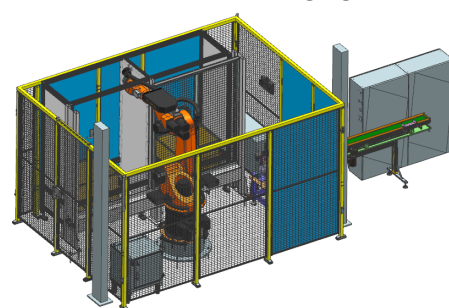
- » First assembly line with the virtual commissioning
- » Many different cells (each cells needs its own virtual commissioning)
- » Challenge: bring all virtual cells together

Planet Sorting Machine



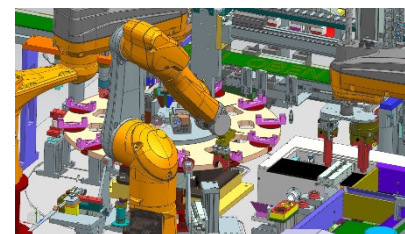
- » New machine with robot application
- » Complete test of PLC, HMI and robotic
- » Benchmark project for virtual commissioning

Nedschroef Press Packaging



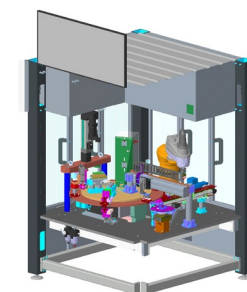
- » New machine with robot application
- » Complete test of PLC, HMI and robotic
- » Narrow robot with change gripper

Ausgleichswelle Assembly Cell



- » Existing machine in production with new robot application
- » Partly test of PLC, HMI and Robotic
- » First time connecting the virtual commissioning with process control system MaQS

Messezelle



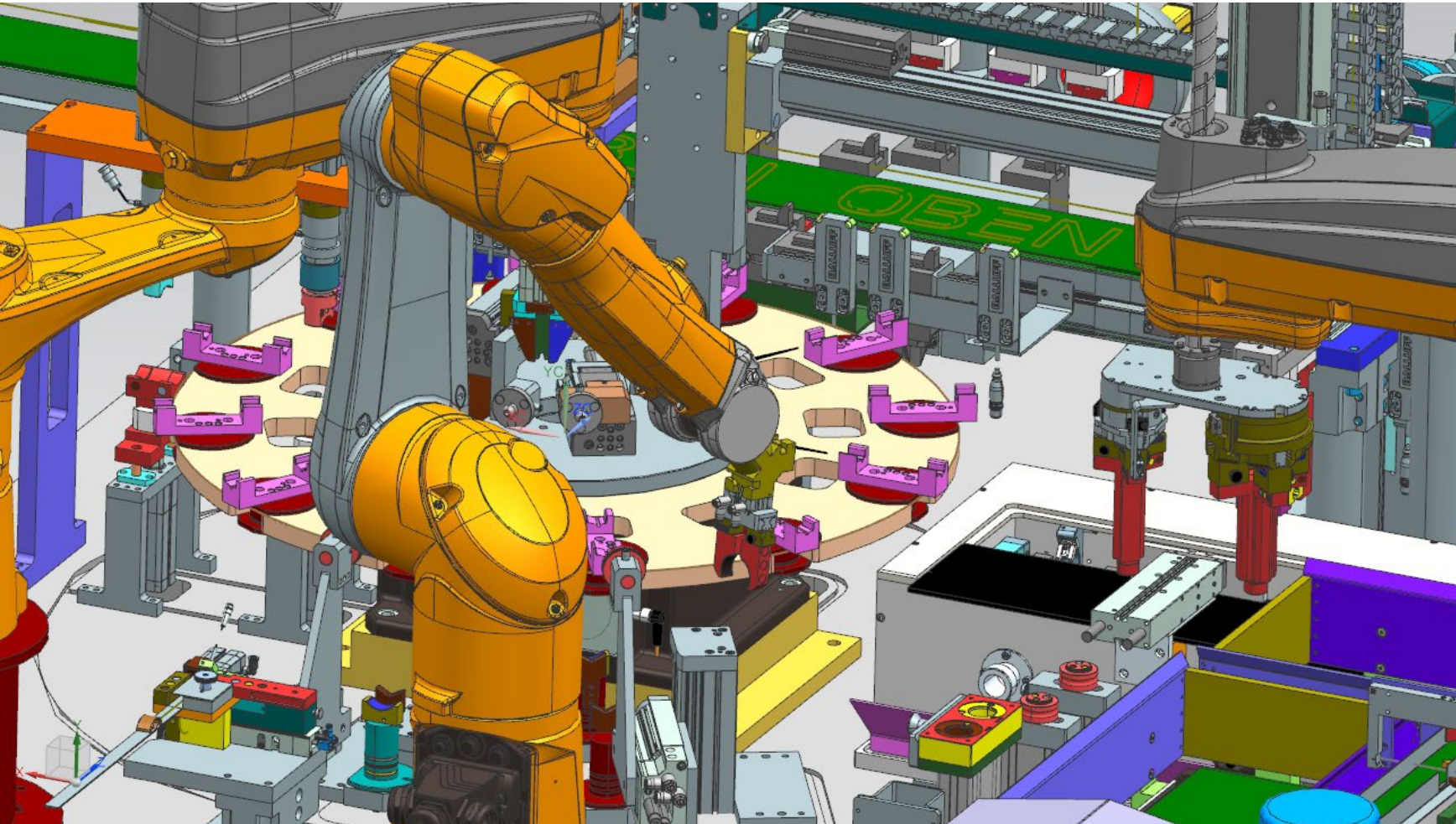
- » Demonstrator for skills of the SMB
- » Due to Covid-19: full virtual commissioning via HomeOffice
- » Virtual Twin will be also presented at fairs

Project „Messezelle“

The virtual commissioning enables:

- SPS-Entwicklung, Inbetriebnahme und Tests wurden durch die virtuelle Inbetriebnahme effizient im Home-Office durchgeführt
- Gesamtautomatik, sowie Sonderrouinen, wie das Kalibrieren sind bereits abgeschlossen
- Zwischenzeitlich ist auch die Montage der Zelle beendet und in Kürze beginnt die reale Inbetriebnahme der Anlage

Project „Ausgleichswelle“



The virtual commissioning enables:

- Fast commissioning of basic cell
- Faster tests of robotic and automatic motion sequence
- No time loss trough late delivered parts and work trays
- Potential defects/faults can be resolved in advance
→ Minimizing risks
- High software quality in an earlier phase of the project
→ Ensuring quality

Project „Ausgleichswelle“

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