Process Improvements for Caterpillar’s Medium Wheel Loader Line

Project Objectives:
- Reduce cycle time of zone 9 by 11% by decreasing walking distance and workload leveling
- Evaluate current line balance efficiency and propose solutions to improve the balance efficiency
- Collect cycle time data to improve simulation accuracy
- Assess ergonomic issues in high-risk zones and propose appropriate solutions

Design Tasks:
- Develop new layout for zone 9
- Implement 5S improvements for zone 10
- Develop Spaghetti maps and propose changes to the layout to reduce unnecessary travel
- Identify work that can be moved between zones on the assembly line
- Obtain and verify process times for simulation data
- Calculate balance efficiency for the assembly line using the process times
- Measure stress on the operator using 3DSSPP from climbing
- Assess operator motion in zone 12 using RULA

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Final Design:
- Designed zone 9 layout to reduce travel time
- Relocated suggested processes to balance workload in zone 9 and improve balance efficiency
- Safety improvements for zone 10 to reduce risk of injury by the application of lubricant and stretching techniques
- 5S for improved lean layout in zone 10
- Proposed an optical device to decrease non-value added time and increase safety in zone 16