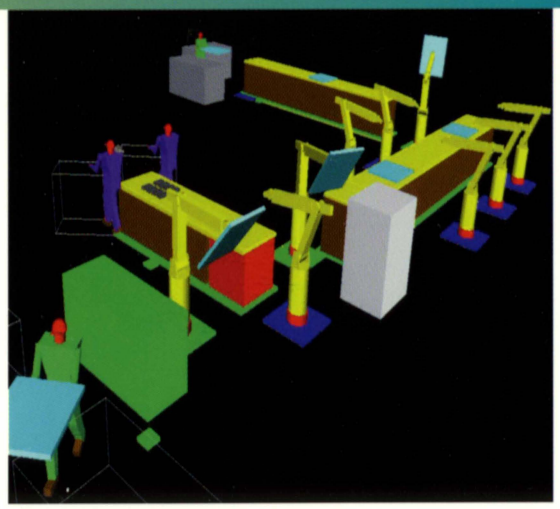
VEHICLE ASSEMBLY

PROJECT

Underbody Robotic Sub-assembly

CUSTOMER

General Motors Corporation



Objectives

1. Evaluate and prove the systems' ability to meet throughput objectives of 90 JPH "gross" and 77 JPH "average yield."
2. Identify any deficiencies (bottlenecks) in cell flow as well as potential improvements to the cell design.
3. Define the effects of downtime, part shortages and operator efficiency.

Description

A base model was developed for each of the sub-assembly cells under study. The base model simulation was run without the effects of downtime to verify that objective #1 was achieved and that input parameters were correct. Based on a random approach, downtime effects were applied to the model, and changes in the system behavior were recorded. This allowed the identification of system bottlenecks from statistical data. "What-if" scenarios were then performed on the simulation model to determine how the effects of downtime, material shortages and operator overcycles can be offset, thereby improving throughput.

"Bottom Line" Results

System Throughput:	78.5 JPH	*Base model*
Downtime Applied:	73.9 JPH	
Early and Late Breaks:	64.9 JPH	
Part Shortages On:	59.3 JPH	
Quality Issues On:	47.4 JPH	

Station #3 identified as the system bottleneck. Part #4957 shortage significantly affected throughput.

Eliminating material shortages associated with part #4957 ····· *resulted in 52.1 JPH*

Replacing Station #3 fixed conveyor with an accumulating conveyor ····· *resulted in 52.8 JPH*

Improving Station #3 and Robot #1 cycle time to 40 sec ····· *resulted in 59.5 JPH*

Eliminating early and late breaks ····· *resulted in 67.4 JPH*

Eliminating quality issue problems and resulting delays ····· *resulted in 84.2 JPH*

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