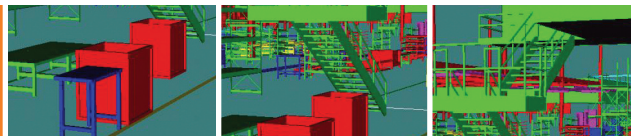


Factory layout and planning boosts Mack Trucks, Inc.'s bottom line

Tecnomatix solutions help truck manufacturer shrink production costs and avoid unnecessary capital expenditures

Siemens PLM Software

www.siemens.com/plm



► Issues:

Move and consolidate factories
 Capitalize on reorganization to boost plant efficiency

► Approach:

Design and analyze factory operations in software
 Evaluate alternate layouts and material handling scenarios virtually
 Predict outcome of plant changes before making them

► Results:

Dual-plant consolidation completed on time, in only 14 months
 Ineffective factory rearrangement avoided, saving millions of dollars
 Cost of factory layout and planning software paid off in less than one year

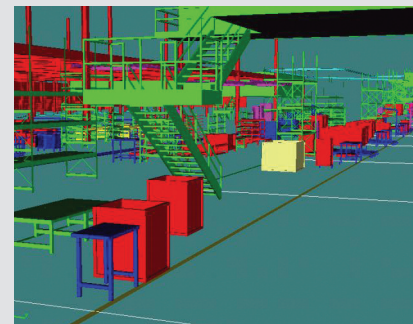
MACK TRUCKS, INC.

- After being acquired by Volvo, Mack wanted to take advantage of the ensuing reorganization to enhance production efficiency.

Optimizing production during reorganization

Mack Trucks, Inc. is one of North America's largest producers of heavy-duty trucks. The company's bulldog mascot, which adorns the hood of all Mack trucks, symbolizes the legendary strength and durability of these vehicles.

Mack was recently acquired by Volvo of Sweden. In the Americas, the manufacturing operations for both Mack and Volvo Trucks are referred to as North American Manufacturing (NAM). After the acquisition, NAM went through a period of reorganization in which some of its assets were consolidated, with the goal of eliminating redundancies and enhancing efficiency. Because the reorganization involved moving and closing some facilities and altering the floor plans of others, NAM relied on product lifecycle management (PLM) technology from Siemens to make sure the reorganization was as beneficial to the bottom line as possible. The company used Tecnomatix® solutions to evaluate alternate assembly and material handling scenarios and to predict the outcome of proposed changes before they were adopted.



Working virtually first

One of the biggest changes driven by the acquisition was the closing of a large Mack assembly plant in South Carolina. Operations performed there were moved to the 1.6 million-square-foot New River Truck Plant in Dublin, Virginia. The scope of the project was enormous and the company was given only 14 months to complete the transition. "We had to take about 700,000 square feet of operations and recreate them within another, existing facility," explains Duane Pape, manager of Manufacturing Support Systems for Mack Trucks, Inc. "We didn't want to just move everything as it was. Even though the clock was running, we wanted to take advantage of the move to get rid of the usual inefficiencies that build up over time with industrial evolution. We wanted to go into the new space with the best layout possible."

Rather than relying on assumptions about issues such as material flow and labor utilization, as was done in the past, Mack's South Carolina Manufacturing Engineering Team decided to work virtually first. Siemens' 3D plant modeling solution, FactoryCAD, was used to quickly create

Solutions/Services

Tecnomatix FactoryCAD
and FactoryFlow

Client's primary business

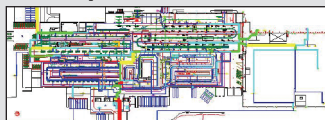
Mack Trucks, Inc. is one of North America's largest producers of heavy-duty trucks.
www.macktrucks.com

Client location

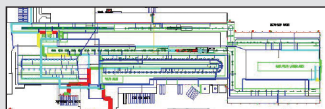
Allentown, Pennsylvania
United States

"Using Tecnomatix solutions, Mack has optimized plant layouts and saved millions of dollars in unnecessary capital costs."

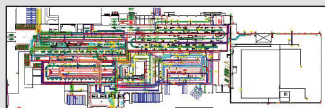
*Duane Pape
Manager
Manufacturing Support Systems
Mack Trucks, Inc.*

Plant optimization

Baseline



Alternative



Optimized

digital models of both the South Carolina and the Virginia facilities. Then they fine-tuned the South Carolina facility's layout to optimize production efficiency within its new Virginia location. The use of FactoryCAD allowed Mack to create 3D plant models much faster than creating traditional 2D layouts, which facilitated meeting the 14-month deadline while also making improvements to operating efficiency. "With FactoryCAD, communication was improved, the layout was created in 3D significantly faster than traditional 2D methods and layout issues were discovered virtually versus during plant startup. We were able to close the old plant on time, which resulted in a significant reduction in fixed costs," says Pape. "But we also were able to make changes to those operations in the new Virginia location that decreased the number of labor hours per product in the new facility."

Benefits to the bottom line

Another significant cost savings resulted from the ability to simulate and compare different material handling scenarios in FactoryFlow material handling optimization software. There are different philosophies of material handling, and after the acquisition it was proposed that a Mack plant adopt a different philosophy for one of its plants. This would have entailed a very large, multi-million dollar rearrangement and addition at that facility. The goal was that by making certain changes, both direct and indirect labor costs should be reduced by 30 percent.

After modeling the current and proposed material handling scenarios in FactoryFlow, the analysis team determined that the proposed change would not reduce labor costs by the predicted amount. In fact, it might have actually incurred higher costs. "These results not only made it possible to avoid spending millions of dollars, but we used the software to tweak the existing material flow to make significant improvements," Pape says.

Future benefits for free

Tecnomatix software plays an ongoing role at Volvo's NAM. "Having tools such as these, which let you plan and evaluate different factory scenarios, is much more effective than the old methods that involved lots of assumptions and relied on the experience of the engineer," Pape can point to a number of Tecnomatix projects in which efficiency gains were made: a rearrangement of a workstation that saved operators 107 miles in walking distance a year; elimination of one position; a warehouse reorganization that allowed more work to be done without hiring more fork lift operators. In addition to strategic cost avoidance, Pape's goal was to have the Tecnomatix software pay for itself in its first year through savings such as these. "That's what happened," Pape adds.

Future plans for Tecnomatix at Mack and Volvo Trucks North America call for even greater use of PLM tools, in more of a predictive and monitoring role. What has hindered this in the past has been the difficulty of getting the necessary data to perform the analyses. With software from Siemens, such data is immediately available for productive application. "Product data is readily available to the Tecnomatix solutions, and product information management solutions, such as Siemens' Teamcenter® software, makes the information readily accessible to manufacturing support engineering," says Pape. "We will eventually get to the point where we can perform instantaneous analyses on demand."

Other considerations include using a Teamcenter data repository to include process, resource (machines and tooling) and plant information. This will make the information available to a broader segment of the company, such as manufacturing engineering management. Thanks to the significant measurable business value already gained through PLM solutions, and that expected to come, Mack and Volvo Trucks are actively evaluating extending the partnership with Siemens to expand the use of the Siemens solution suite.

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