



UMaine engineering students Scott Guertin (left) and Dennis Poole watch Wednesday as their team's machine plucks racks of steering stabilizer bars off a conveyor at the Lemforder Corp. in Brewer. (AP Photo)

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Team solves conveyor problem at Lemforder plant in Brewer

By Andrew Kekacs
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BREWER — Humanity's age-old endeavor to build a better mousetrap found a modern parallel Wednesday at Lemforder Corp.

Since last fall, three teams of engineering students from the University of Maine have been struggling to solve a deceptively difficult problem: how to deliver automobile parts from an overhead conveyor line to machine operators on a plant floor.

When the six-month competition reached its climax Wednesday, a classic engineering adage was proved once again: Keep it simple, stupid. The winning design was the smallest and least complicated of three prototypes judged by Lemforder employees.

"It's nearly a perfect machine," said Greg Damboise, a Lemforder engineer and one of five judges. "It has very good potential" to be used on the plant's production line, he said.

At present, Lemforder employees are forced to leave the assembly area and walk up a short flight of stairs to a catwalk. They remove parts by hand from a slowly moving conveyor, then carry them downstairs to the production area.

Lemforder managers knew there had to be a better way, and they asked students in the university's mechanical engineering tech-

nology program to find it. Twenty students took up the challenge to build a robotic unloading device for their senior project.

"Lemforder had already spent time working on this problem," said Dennis Poole of Orono, one of the students and a part-time Lemforder employee. "They were unsuccessful. We threw out concepts and started over."

Poole said the biggest hurdle was convincing the company to devote several months to the project. Normally, Lemforder engineers would be given two weeks.

Each student team was given \$500 for new supplies and free access to Lemforder's spare parts room. They spent months refining the designs in laboratories at UM, before bringing their robots to Lemforder for final testing.

"This has been a wonderful company to work with, from the workers to the president," said Herbert Crosby, professor of mechanical engineering technology. "They've turned the plant upside down for us. ... I'm willing to bet there are very few plants in the country that would allow it."

Although the designs were developed in secret, two of the three teams decided to use air-powered devices to knock parts from the conveyor.

"Pneumatics is the way to go," said Luke Dorr of Appleton, who was on the second-place team.

"It's more efficient than using electric motors, and most plants already have large compressors."

The six seniors on the winning team were John Belding, Larry Doucette, Steve Moulton, Lawrence Paul, Michael Townsend and Sean Watson. They designed a machine that uses one light-operated sensor, two pneumatic push bars and a nonmotorized delivery chute to transfer steering parts to production workers from the moving conveyor line.

The winning machine "had a high level of craftsmanship," said Damboise. "It was robust and rugged. It did minimum damage to the surface of the part. The delivery system was the best. It was well-guarded and well-covered, and there was no way for a part to fall out and hurt an operator."

During the test, the machine failed to remove three of 96 parts from the conveyor. That was a minor flaw, according to Damboise.

"It just needs a little debugging," he said. "The only thing I didn't like was the limited adjustability" if sizes or shapes of parts changed.

The six members of the winning team will split a \$500 prize offered by Lemforder, and the multi-billion-dollar German automobile parts company owns all rights to the new robot.