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Penn-Air & Hydraulics embraces robotics as a complement to humans

By **Roger DuPuis**, April 14, 2017 at 3:00 AM



Zach Hoerr, a mechanical engineer with Penn-Air & Hydraulics' automation team, demonstrates how the ABB YuMi dual-arm robot can work with humans on precision manufacturing tasks involving small objects. Hoerr, the company's YuMi specialist, programmed the device to put together a puzzle made up of acrylic pieces as part of a demonstration at Penn-Air's Springettsbury Township headquarters in York County. - (Photo / Roger DuPuis)

Zach Hoerr carefully wheeled a waist-high cart across the lab room floor, spooling out a length of orange extension cord.

Atop the cart, two mechanical arms bent downward from a white plastic tower, poised almost as if to catch a baseball or cradle a child between them.

In place of fingers, however, small pincer-like grips extended from each hand, awaiting their next assignment. Hoerr slid a pronged plug into a wall socket, tapped some information onto a hand-held screen and the limbs smoothly came to life, gesticulating like a sleeper stretching after a restful nap.

Those awakening arms represent one of the most profoundly disruptive **innovations** in the history of manufacturing, robotic automation.

At a time when concerns about robots and automation replacing American workers run deep, Hoerr and his colleagues at Penn-Air & Hydraulics in Springettsbury Township, York County, see a different potential in such technological advances.

For them, automation is a tool that can help their customers in **the manufacturing industry** reduce the physical risks to workers, while the newly arrived line of robots Hoerr demonstrated are designed to work with employees on tasks, not in their place.

“YuMi is the first truly collaborative dual-arm robot,” Hoerr said of the device. Designed and marketed by Swedish-Swiss engineering group ABB Robotics, YuMi is now available through Penn-Air.

Its name, a portmanteau of “you” and “me,” is intended to emphasize how the robot was created to work with humans on tasks such as small parts assembly — and to do so safely without the need for protective cages, Hoerr explained.

The robot’s arrival at Penn-Air marks a new era for the company as much as for manufacturing.

Late last year, the 48-year-old hydraulics and pneumatics supplier moved from a 24,000-square-foot building at 1750 Industrial Highway in Springettsbury Township, to an 116,000-square-foot building at 580 Davies Drive.

And in November, the company launched its robotics and automation team, COO Seth Bray said.

The robot effect?

Penn-Air’s leaders aren’t the only people thinking about how robots and automation affect manufacturing.

As the 2016 election and **President Donald Trump’s trade policies** have focused on the loss of American factory jobs to off-shoring and overseas competition, a parallel, dissenting narrative has arisen among economists, academics and journalists: robots, not foreign workers, continue to pose the biggest threat to U.S. industrial jobs.

That has been the subject of recent reporting in the New York Times and Wall Street Journal and the Associated Press, among other outlets.

Meanwhile, a March Washington Post story highlighted a study by the National Bureau of Economic Research that found that as many as 670,000 American jobs have been lost since 1993 through automation in manufacturing, and analyzed the data to find that places most affected by the trend were most likely to vote against presidential contender Hillary Clinton — either in favor of Trump or Vermont Sen. Bernie Sanders — last November.

Nationwide, Michigan figured most prominently in that category, thanks to large-scale automation of the automotive industry there, the story reported.

Figures for individual counties were not disclosed, so numbers for Central Pennsylvania were not immediately available, though color-coded maps with the story showed that the pace of automation here was less intense than in Michigan and heavy industrial areas in Indiana and Ohio, for example.

Still, not everyone is sold on the notion that more robots automatically leads to fewer jobs.

A 2015 Brookings Institution report noted that while U.S. manufacturing jobs fell as automation increased, making a direct correlation between robots and job losses likely glosses over other factors. Germany, for example, installed far more robots, yet lost only 19 percent of its manufacturing jobs between 1996 and 2012, compared to a 33 percent drop in the United States, Brookings noted. Such trends existed in other countries as well, the report added, while the United Kingdom and Australia saw faster manufacturing job declines despite less investment in robots.

Rather than being a hindrance in Germany and Sweden, robots actually helped those nations increase productivity, Brookings suggested.

Safety, productivity

While journalists and academics research and debate, Penn-Air is finding that its customers have a wide range of uses for automation in conjunction with human labor, and such automation isn't limited to robots like YuMi.

A tour of the Davies Drive facility underscored the point. On the factory floor, staff showed off new devices they engineered to help one local manufacturing client — whom they declined to name for proprietary reasons — reduce the risk of limb injury to workers feeding parts along an assembly line. The plastic and metal cages help shield employees from burns and moving parts by blocking access to components until it is safe to touch or retrieve them.

And that, Bray said is the point: Automation can be used to reduce the risk of repetitive stress injuries and other dangers to workers, allowing them to do existing tasks more safely or being more productively deployed to other areas of the process.

Some automation does eliminate jobs, Bray acknowledged, as it's up to employers to decide how they will use technology. Penn-Air's goal is to provide its customers with the solutions that best fit their needs.

The company's vision remains one in which humans and automation increasingly work hand-in-hand.

Penn-Air CEO Cheryl Rhein reiterated that the company isn't promoting YuMi and robotics as a replacement for people, but as a tool to work alongside people as customers innovate their production processes.

Back in the lab, Hoerr showed how YuMi is designed to meet that objective.

He set before the robot a half-dozen or so odd-shaped pieces of acrylic, each an inch or two wide. YuMi grabbed and moved each one, which together formed a puzzle spelling out the company's name.

Hoerr, a mechanical engineer whose title at Penn-Air is YuMi specialist, explained that it was fairly easy to program the robot to undertake the task — even for someone like him who is not a computer programmer. In fact, Hoerr said, he recently showed a group of Boy Scouts how to do the same thing.

"I loathe programming," Hoerr said. "But I think this is fun."

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