

# Safe at work

**Leveraging technology to  
improve workplace safety**

BY TENLEY TORRE, BOEING WRITER

For over a century, Boeing has empowered employees to incorporate the latest technology into production processes to increase safety, efficiency and quality simultaneously.

“Human beings have certain limitations that can cause risks to their safety,” said Carla Davis-Madgett, vice president of Boeing’s Environment, Health & Safety organization. “We don’t always have the wherewithal to know the risks that exist all around us. Technology can help bridge that gap and keep us safe in the workplace.”

#### SAFETY TOUR

Carla Davis-Madgett, Boeing’s Environment, Health & Safety vice president, recently walked through Boeing South Carolina with Paul Rollerson, a fabrication specialist.

PHOTO: JOSHUA DRAKE/BOEING



**FABRICATION CONVERSATION**

Paul Rollerson guides Carla Davis-Madgett through the 787 manufacturing process.

PHOTOS: JOSHUA DRAKE/BOEING



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**HE KNOWS THE DRILL**

Erik Pham, Environment, Health & Safety senior director, says this drilling machine helps mechanics perform high-volume and ergonomically challenging drilling and countersinking tasks.

PHOTO: CODY JEWETT/BOEING

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**Out of Harm’s Way: Embracing Automation and Robotics**

Boeing also takes employees out of harm’s way using automation and robotics during the production process.

“Incorporating automation and robotics into our production process has been extremely beneficial. It allows us to reduce the number of hazardous tasks our employees are exposed to and reduces those tasks that are ergonomically strenuous on the body,” Pham explained.

“For example, there are millions and millions of holes drilled at Boeing. In the past, this was done by hand. By incorporating automation, we have machines and automated tools doing the repetitive hard drilling. This reduces the physical stress a person would endure and eliminates the risk of injuries, allowing them to perform other work that is less physically stressful. We no longer have to put that strain on our teammates.”



**BETWEEN THE LINES**

Autonomous ground vehicles, or AGVs, follow a safe path along the factory floor, performing duties such as transporting products or materials within a manufacturing facility or warehouse.

PHOTO: AL SALOUR/BOEING



**VESTED INTEREST**

Working on a 767 in Everett, Washington, mechanic Jason Turner is much more comfortable thanks to a shoulder-support exoskeleton vest.

PHOTO: PAUL CHRISTIAN GORDON/D.J. & COMPANY

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**Worth the Wear: Exoskeleton Tech Eases Ergonomic Stress**

Currently, the majority of workplace injuries are ergonomic. This is another key area Boeing is focusing on and using technology to improve.

“We’ve worked to make advancements to the tools and equipment our employees use daily by developing ergonomically designed tools and other personal protective equipment,” said Pham. “But we also take advantage of our exoskeleton technology. This wearable technology, like an external body suit or vest, assists employees with strenuous work.

“Exoskeleton technology helps protect our employees by relieving pressure, improving posture, and providing more comfort and support. It targets repetitive motion that could cause ergonomic issues, and by alleviating some of that burden off the user, we minimize some risks and injuries.”

**A Safe Future: Tech on the Horizon**

According to Davis-Madgett, the company has made great strides to use tech to improve workplace safety, but there is more to come.

“We are excited about the future of incorporating technology and how we can bridge the gap between what people can see versus what they can’t,” Davis-Madgett said. “Augmented reality (AR) is a tech we are moving toward. This would allow us to approach scenarios in a safe and virtual space.

“This would allow us to identify risks without exposing employees to those risks. Additionally, I see this as a way to train employees. AR gives us the ability to test different scenarios in an augmented space and build the muscle memory to create an emotional response or reaction. That way, in the real world, employees are aware of the risks before they happen.”

The company is also considering sensor tech for hazardous chemical detection in the environment, real-time presence detection, hazard proximity for employees, and other occupational and environmental uses.

“The value of sensors is incredible,” Davis-Madgett said. “Human beings have limitations, and we can’t see everything. Sensor tech allows us to see a lot more and helps our team members focus on the work while protecting their body.”

“Sensor technology monitors and provides real-time communication,” Pham said. “For example, it can provide a notification when someone is too close to an edge or safeguards like shutting down a machine if someone enters an unsafe area.”

Pham said reducing employee exposure to some high-hazard risks resulted in a significant decrease in recordable injuries.

**Move to Digitalization: No More Piles of Paper**

“When I first started here, I remember there being a lot of paper,” recalled Pham. “All the instructions for building our products were printed on reams and reams of paper. There was so much paper that employees had to use carts to haul these instructions to and from their work areas, creating a safety hazard in the process.

“Now, due to the advancement of technology, all of that paper has been digitized and moved to portable devices. This alone is an amazing transformation of technology advancement in the workplace.

“As a result, we are able to provide more accurate, detailed and efficient information and data that is timely and easily accessible. This enables employees to make better decisions by being more aware of their environment, equipment, processes and potential dangers.”

**Strength in Numbers: Injuries Are Down, Safety Is Up**

Pham said the company strives to go beyond regulatory compliance to mitigate or eliminate workplace safety risks and injuries. Technology is instrumental in preventing fatalities and reducing serious and acute injuries.

“Technology has changed the way we keep our employees safe in the workplace, from physical application to process efficiencies,” Davis-Madgett added. “But no amount of tech can replace human performance. Our goal is to create a workplace where employees can come to work, make the products that makes Boeing successful, and go home at the end of their day as safe and healthy as when they arrived. We’ve made significant progress, but we’re always looking for new and emerging ways to keep our teams safe.” **IQ**