Workforce Training, International Competitiveness of Wisconsin High-Tech

Dr. Bandara Gamini, University of Wisconsin-Platteville

While trade wars and tariff are headlines, we should also feature that Wisconsin leads in high-tech manufacturing, including medical devices, and exports internationally, including to China. Workforce training at the University of Wisconsin-Platteville contributes significantly to the manufacturing of these instruments. This was highlighted during a recent visit to GE Healthcare in Madison, Wisconsin, by UW-Platteville Industrial Studies (controls and automation minor) faculty member Dr. Gamini.

Wisconsin, "America's Dairyland" exported about $3 billion in agricultural products in 2017. However during the same time period, Wisconsin exported over $4 billion in medical and electrical equipment. Department of Agricultural Trade states that manufactured goods account for 86% percent of all Wisconsin exports.

Internationally, including Chinese hospitals, consider U.S. medical instruments to be of superior quality and the most technologically advanced. UW-Platteville alumni Alan Luckow and Michael Ferris, Manufacturing Engineers at GE Healthcare in Madison, credit the industrial studies major and controls minor for their superior hands-on education, combined with a sought-after work ethic and depth of knowledge in the automation and controls subject area. They attribute their applied and real-world education as a key factor for their success at GE Healthcare in
Madison; manufacturer of the highest quality, dependable and technologically advanced medical equipment, sought world over.

The manufacturing efficiencies at GE Healthcare in Madison include collaborative robot loading, assembly, stress test and quality control inspection systems. Implementation and fixtures by alumni Luckow and Ferris, are contributors to these manufacturing efficiencies.

Internationally there are other companies manufacturing medical devices, (including the Chinese domestic medical device companies) that manufacture essentially the same equipment the GE Healthcare in Madison exports to China. Yet, hospitals prefer the American equipment due to the quality, physician friendly interfaces, technologically advanced features, durability, and robust dependability. For example, the individually tracked, laser engraved, inspiratory/expiratory flow sensors on the breathing machines are independently calibrated and are 100% stress tested to ensure their superior quality and dependability. In addition, the flow sensors have pathogen and functional preventative maintenance data for the hospital biomedical engineering department and have management information system interfaces. Michael Ferris regaled legends where Madison’s GE Healthcare manufactured ICU ventilation and assistive-breathing machines, airfreighted from Madison to India, transhipped strapped on a quarter-ton Tata pickup truck to boat dock, unloaded on to a canoe, then taken to a remote village hospital; now saving lives, day in and day out, 24/7/365 unwaveringly dependable.
GE Healthcare Madison also specializes in anesthetic agent Isoflurane, Sevoflurane and Halothane vaporizing delivery systems, which are used in the various premium anesthesia devices made there. These vaporizers combine clinical performance with ergonomic design to deliver individually calibrated, stress tested units providing an output consistent with the dial setting throughout the clinical flow range, from 200 mL/min to 15 L/min.\textsuperscript{[5]}

Equipped with easy turn, large diameter control dials, these vaporizers incorporate fine graduations of 0.2\% between 0 and 8\%, are critical in error free, reliable anesthetic agent delivery systems. In addition, they minimize filling frequency, the vaporizers accommodate 225 mL of anesthetic agent.\textsuperscript{[5]}

These detailed and critical parameters are decisive since anesthesia monitoring devices are used to measure the depth of anesthesia during surgery and to observe patients’ physiological state. GE Healthcare in Madison has progressed from stand-alone, non-networked systems to networked anesthesia workstations that comprise anesthesia monitors and anesthesia information management systems (AIMS). In addition, GE Healthcare has introduced anesthesia machines with extra features such as advanced ventilators, additional and new modes of ventilation, graphical screens and loops that offer a clearer picture of the patient, with a major proportion of the ventilators now electronic and driven by software.

Yes, while honoring our heritage "America's Dairyland" we also commend and accolade awarded to our high-tech manufacturing base, which earns billions more than our agricultural production. We excel in our world-class medical and electrical equipment, building the highest quality, dependable and technologically advanced equipment, sought world over. While trade
wars and tariff are headlines, we should also showcase that Wisconsin leads in high-tech manufacturing including medical devices which are exported internationally, including to China. Workforce training at UW-Platteville contributes significantly to the industries manufacturing of these most sought after products.