WHIRLPOOL CORPORATION

SCREWS INSTALLATION WITH COLLABORATIVE ROBOTS AND GLOBAL STRATEGY

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Over the years, Whirlpool has established itself as a leading global manufacturer of home appliances. In 2015, the company sold nearly $21 billion worth of product across 170 countries. The company's most prominent brands include Whirlpool, KitchenAid, Maytag, Consul, Brastemp, Amana, Bauknecht, Jenn-Air, and Indesit. As a leader in this industry, the organization is continuously implementing innovative technologies to enhance its manufacturing capabilities and maintain its competitive advantage. In particular, the Global Advanced Manufacturing (AM) group is responsible for identifying opportunities for emerging technologies in Whirlpool operations and providing standardized workflows for streamlined implementation. Recently, the AM group has developed a focus on collaborative automation in order to improve working conditions for operators, increase productivity, and stay ahead of emerging labor issues. As a result, they challenged the Tauber team to identify and develop a collaborative robot application which can be implemented on a global scale.

After visiting several Whirlpool operations, the Tauber team identified screwdriving as one of the organization's most common assembly processes which expose operators to ergonomic risks. Today, Whirlpool operators are collectively driving more than 1 billion screws onto panels over the course of a single year. Not only is this task an ergonomic problem but it is also a task which does not require the cognitive skills of Whirlpool's talent. Thus, the Tauber team has developed a screwdriving collaborative robotic solution to offload this repetitive task to a robot. Specifically, the team has designed a system for Whirlpool's operation in Marion, Ohio which can shoot three screws in 10 seconds onto a dryer back panel which is assembled on a moving conveyor. If this application is implemented at all assembly lines in the Marion operation, 11 total installations will be required, and it will result in an adjusted net present value of $2.53 million by 2021.

The Tauber team also assessed the global opportunity for this screwdriving application and determined that there are opportunities to install 62 robots at 15 operations worldwide, specifically in North America and Europe. If these robots are installed over the course of the next three years, the net present value will be $12.1 million by 2021. Based on the financial analysis, available resources, and time required for each install, the team developed a global implementation roadmap. This recommended timeline prioritizes the order and locations for the next three years (2017–2019) and the team believes that following this roadmap will maximize the impact of this application for Whirlpool.