Snapshot Report

AUSTRALIAN MEAT PROCESSOR CORPORATION

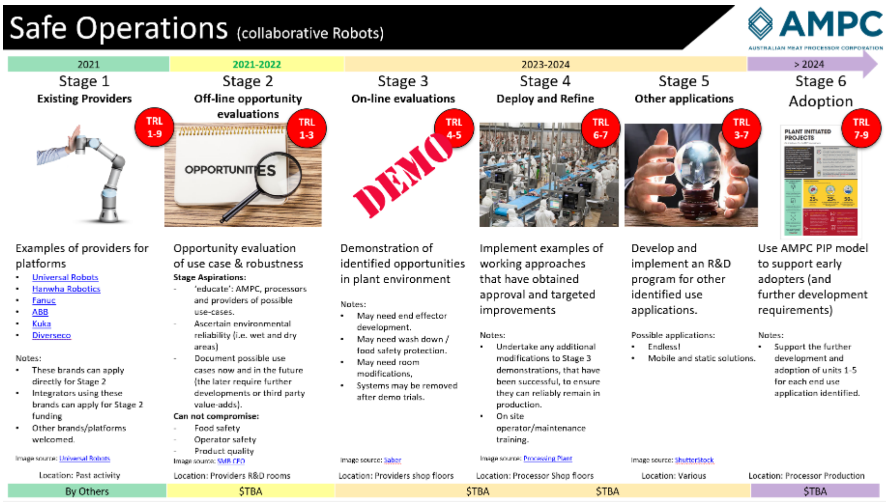
Collaborative Robots Evaluation – Stage 2

Project Code	Prepared by	Date Submitted
2021-1218	Jonathan Cook	28/09/2022

Project Description

AMPC (and the industry) have an innovation vision, and support R&D program, to eliminate all WHS incidents from processing operations. Where possible dangerous tasks will be fully automated. Where automation is not currently viable (either due to technology limitations or ROI), semi-automated/remote solutions will be developed that will remove the operator from dangerous tools and implements. Where semi-automated solutions are not viable then the remaining hands-on tools will be made as safe as possible (i.e. BladeStop and Guardian).

This project focuses on commencing the understanding of how current, and pending, collaborative robots may be deployed within the Australian red meat processing sector. Initially AMPC would like to understand where they can be deployed today. AMPC will also like to understand where they might also be deployed in the future and what additional developments are required of either the collaborative robot platform, end effectors, sensing/visioning, guarding and or changes to current meat processing practices are required to realise future opportunities identified.



Project Content

The methodology for conducting the project was as follows:

- Purchase a collaborative robot for the purposes of demonstration
- Undertake opportunity analysis with AMPC on a number of potential red meat use-cases for collaborative robots and select 1-2 for demonstration
- Perform a demonstration of the use-case(s) to AMPC
- Present development pathway to AMPC for next steps

Project Outcome

Initially the use-case of Whole of Pallet barcode scanning was selected for demonstration due to its ideal nature for a collaborative robot task. The application itself was also thought to possess several significant future value-add opportunities for future development. The initial trials performed demonstrated that a collaborative robot could feasibly be used in a system to scan the barcodes on a pallet. The next steps for such a system would be to develop a prototype which is tested on-site. Unfortunately, there was not significant market interest in this system at the time of performing this project. If this situation changes in the future and the business case for such a solution evolves, then it would be technically feasible and suited to a collaborative robot.

Following this industry feedback, the project was pivoted to investigate alternative applications: the marking of rib scribe lines on a carcase, the painting of rib scribe lines on carcase, and vacuum-packed primal pick and pack. Initial trials were performed at Intelligent Robotics's facility for each of these applications to demonstrate their feasibility and confirm the collaborative robot was able to perform all of these tasks without presenting any issues (e.g. tripping). The results of these initial trials were presented to AMPC and a processor, and a site visit was organised.

For scribe line marking site trials, the collaborative robot was able to successfully score markings on the carcase without any issues. There were however concerns around the safety of the marking operation, and whether it would still require guarding. Painting of the scribe lines would address this to some extent, but the ideal technology would be to utilise a printhead. A development roadmap was presented on the next steps for collaborative scribe line marking.

For vacuum-packed primal pick and pack, the collaborative robot was able to successfully pick and pack a carton of beef eye round primals. There were a number of other primals and packing patterns which were able to be successfully trialled and demonstrated. Collision tests with the robot were also performed successfully to confirm the safety of the collaborative robot performing this task without needing guarding. The collaborative robot appears to be a good enabler for automation of this task in the red meat industry. A development roadmap, including proposed minimum viable product specification, was presented to outline next steps for the technology in this area.

Benefit for Industry

The Australian Meat Processor Corporation (AMPCs) current Strategic Plan 2020-2025 has the following seven sub-strategic components which we believe Collaborative Robots / Cobots should be able to make an impact on now:

Advanced Manufacturing sub-strategy

- Removing staff from dangerous operations, via Hands-Off processing (not this does not necessarily mean full automation, and why collaborative robots is an interesting proposition platform for the industry to consider).
- Carcase Primal Profitability Optimisation, via increased accurate processing.
- Digitisation, via acquiring product information and leveraging data insights.

People and Culture sub-strategy

- Safety and Wellbeing, via reducing the high-risk nature of some processing operations.
- Attraction, via demonstration and developing a wide range of operations.
- Retention, via improving working conditions and making tasks exciting.
- Development, via developing tasks that require higher skills and intellect – operational & technical.

The objectives of this project are to ascertain:

(1) An understanding of where collaborative robots could be deployed today within a meat processing business.

(2) An understanding of where collaborative robots may be utilised in the future in the industry, and what is preventing this from occurring today.

To engage with possible meat processing customers who, by seeing the potential of the deployment of collaborative robots, engage with AMPC and providers/integrators to then deploy demonstration solutions at a range of Australian red meat processing facilities against the range of identified 'today' opportunities.