SCOTT TECHNOLOGY LIMITED

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# final report

Project code: P.PSHP.0527 Sean

Prepared by: Starling Scott Technology

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# Manual Assist (Hook Assist) Commercialisation

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# Abstract

The HookAssist system platform(based on Cobotics™), has been developed to a prototype stage by KineaDesign, via a fully funded program from the Australian Red Meat Industry through Meat and Livestock Australia(MLA) and Australian Meat Processing Corporation(AMPC). Scott Technology was awarded the commercialisation process, including demonstration to the industry of the benefit of such a system. After limited trialling, Scott (and the industry) has still not been able to ascertain the true benefit and best application of such a technology. For this to occur the current platform requires KineaDesign to undertake a final design iteration of the gimbal electronics to ensure that the electronics are more robust and boning room field changeable/repairable.

# Executive summary

The HookAssist system platform(based on Cobotics™), has been developed to a prototype system by KineaDesign in Chicago, via a fully funded program from the Australian Red Meat Industry through Meat and Livestock Australia(MLA) and Australian Meat Processing Corporation(AMPC).

Scott Technology Australia Pty. Ltd was awarded the global commercialisation (and further development) rights. The first stage of the commercialisation process was to undertake a technology transfer process with KineaDesign and secure an Australian processing company to host the first prototype. Both of these requirements were successfully completed, with JBS Brooklyn agreeing to be the host site and Sean Starling and Nick Stanford from Scott Tech and Steve Paloyanidis from JBS undertaking the first stage of the Tech. Transfer process in April 2012 at KineaDesign's office in Chicago.

Having been installed in two processing facilities, online and offline in two different beef boning rooms. These evaluations, although limited in duration have demonstrated two things:

1. The system is simple to use by operators and appears on the surface to provide benefits via the manual assist enabler.
2. The system is far from being a commercially robust system in a boning room environment.

As a result of limited trialling, Scott (and the industry) has still not been able to ascertain the true benefit and best application of such a technology. For this to occur the current platform requires KineaDesign (now HDT Robotics) to undertake a final design iteration of the gimbal electronics to ensure that the electronics are more robust and boning room field changeable/repairable.

# Contents

# 1 Background

In 2005 MLA commissioned a study to identify who were the best providers of solutions for operator/manual assist technology as it was seen as part of the strategy for addressing a number of threatening issues in the meat processing industry including high injury and turnover rates.

From this project MLA and the Australian meat processing industry agreed that NorthWestern University (NWU) in Chicago, IL, was the research organisation of choice to best develop a system based on an 'intelligent assisted' philosophy for the Australian red meat processing sector.

MLA, with AMPC support, first commissioned NWU in 2006, and later on KineaDesign, one of NWU's spin-off companies, to develop several prototypes for the Australian industry to address very demanding nature of some boning jobs, in particular beef boning activities.

In August 2008, a demonstration of the HookAssist (preliminary name given to the Intelligent Assisted Device for beef boning) was carried out at the Northern Melbourne Institute of TAFE, (Epping campus) to Australian beef and sheep processors and producers. During this week at NMIT the device was tried by a number of different boners and industry experts. The device was used to perform the complete set of cuts on both hind and forequarters of a number of beef carcasses, as well as some boning tasks on sheep carcasses. The device proved to be flexible enough to carry out all the tasks that were tried, including: tenderloin, skirt, loin, aitch bone, rump, knuckle, chuck, topside, silverside, brisket, flank, among others.

Following the demonstrations, round-table meetings were carried out to discuss and capture the audience's thoughts, concerns, comments, and suggestions for a subsequent design.

All that feedback was used to refine the set of requirements and guide the design and development of the HookAssist_2.0, the next iteration of system, which should make it flexible

and robust enough to operate in a beef processing plant. Currently KineaDesign is manufacturing the HookAssist_2.0 prototype, which will be shipped and installed in a plant in the second quarter of 2010. The system will be tested and trialled for at least 12 months under normal operational conditions in order to evaluate its benefits and applications to different task, as a previous step for full commercialisation in the Australian market.

In December 2009 MLA invited selected parties to tender for the exclusive global commercialisation rights.

**Figure 1: Hook Assist System (Note: Videos available on request)**

# 2 Project objectives

The objective of the project at a high level is to work with KineaDesign, Meat and Livestock Australia and the Australian Red Meat Industry to further develop the initial investment to ensure that a platform that is commercialised that:

- Adds value to the industry in a commercially viable manner.
- Returns an investment back to the industry.

Contractually the objective was stated as the following:

1. Relocate the HookAssist system from America and install it into an Australian processing plant (Milestone 1)
2. Support KineaDesign in commissioning, trialling and training (Milestone 2)
3. Supervise 12 months of use by the host Australian process site, including suggestions on how to use, taking various measurements, repair and maintenance as required. (Milestone 3)
4. Provide various methods of wider industry demonstration and dissemination, including an open day. (Milestone 4)

# 3 Methodology

## 3.1 Australian Host Site and Technology Transfer Process

MLA and Scott Technology canvased the Australian processing sector inviting companies to nominate themselves to install the first HookAssist prototype. JBS Swift self-selected themselves and nominated their Brooklyn processing facility.

As part of the previous contract that the Australian processing industry had with KineaDesign, an allowance was made in that contract to support the relocation of the prototype to Australia and provide a basic level of training and support over the first few weeks.

The commercialisation process established by MLA required the successful company to undertake a technology transfer process with KineaDesign to ensure the equipment could be supported and further developed once KineaDesign left Australia. Scott Technology supports this approach and allocated two Australian based representatives for this. In addition KineaDesign is undertaking a one day introduction to KineaDesign technology and developments and Scott Tech's New Zealand

Head Office in June 2011. This will further increase the rate of technology transfer and enable the Scott Tech. NZ based design team to provide assistance as required for enhancements and redesigns of future models or extension of the base platform.

Scott Technology sent two Australian representatives along with Steve Paloyanidis from JBS Swift Brooklyn to KineaDesign in Chicago for a week of familiarisation, troubleshooting training and operational evaluation.

Scott Tech. and JBS made various comments on the design of the existing equipment. It was noted that a few of these would require rectification before shipment however the majority of the notes could be addressed in future design iterations as they were not critical to the short term operation of the device during the proposed evaluation period at JBS Brooklyn.

As of the start of May 2011, the system was prepared for shipment to Australia.

## 3.2 Industry Demonstration

During the first week of June 2011, MLA and AMPC held a two day industry conference. Scott Tech. along with KineaDesign and JBS installed the HookAssist prototype at the conference. This installation enabled conference participants to try the system for themselves, although not on meat.

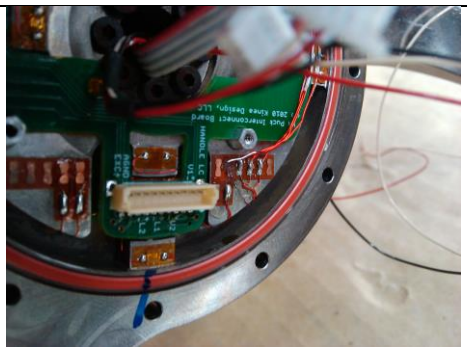

HookAssist at the AMPC Technical Conference (2011)

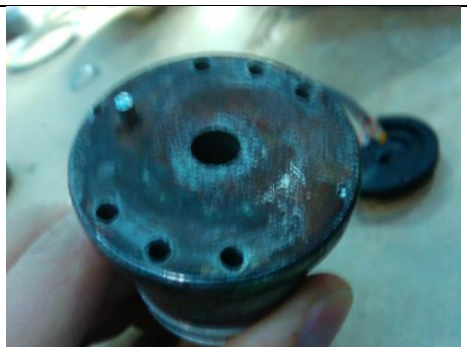
## 3.3 Installation in Australia (JBS Brooklyn)

After the conclusion of the conference the system was shipped to the JBS Brooklyn site where it will be installed in a 'spare' boning room for extensive evaluations.

HookAssist installed in ‘spare’ boning room at Brooklyn

After an initial successful two-three operating days in the spare boning room at Brooklyn it was decided to relocate the system to the main boning room at Brooklyn. During the relocation process the electronics and some mechanicals in the boning arm failed resulting in the arm being detached from the column and sent to Scott (in New Zealand) for repairs with remote support from KineaDesign.



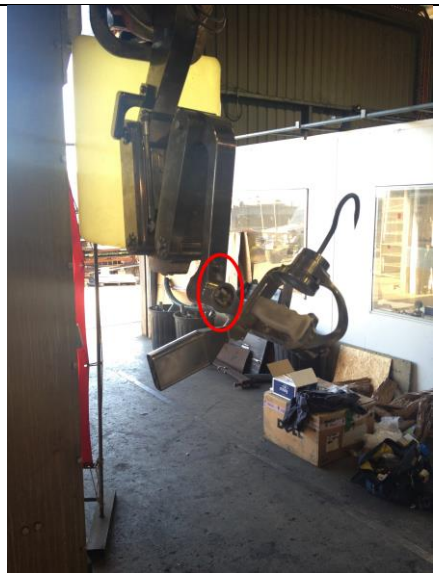


Electrical and Mechanical repairs at Scott.

After the arm was returned and re-installed the momentum and support originally inherent at Brooklyn had deteriorated to a level where all agreed it was best for the success of the technology to find a new location.

## 3.4 Installation in Australia (NCMC)

Simon Stahl at NCMC agreed to be the second host site. The system was relocated from Brooklyn to NCMC and initially installed in the maintenance department to ensure all of the fixes where suitable for reinstallation into a boning room.



System installed at the NCMC maintenance workshop for offline testing.

Having ensured that the fixes were suitable and training and engagement of maintenance, boning room operator, OH&S and QA, the system was relocated to an offline location within the NCMC chiller for trialling away from production pressures, by NCMC boning staff.

HookAssist installed and being trial in a chiller at NCMC.

After successful initial trialling by NCMC boning room staff the system was relocated to the main boning room. After installation the system again had significant electrical component issues, predominantly water ingress and then unrepairable wire breakage when pulling the system apart to dry the system.

| Installed at the NCMC boning room | Example of electrical issues |
| --- | --- |

After this last reoccurrence for water ingresses, followed by electrical connector issues, Scott (with input from KineaDesign) concluded that the system was not commercially ready for a true commercialisation activity.

# 4 Results and Discussion

Although the industry need has not abated with respect to beef boning being an arduous task, the HookAssist concept to date has not been able to remain in production long enough to ascertain if the HookAssist add values to reducing the arduous nature of beef boning and in what boning activities the device is best suited.

KineaDesign, supported by Scott, believe that (1) a final redesign is required to eliminate water ingress and (2) change the nature of the wiring configuration to enable an on-site insitu plug and play approach to be adopted to repairing electrical failures.

# 5 Moving forward

Scott, supported by KineaDesign, will submit a final redesign project submission to the industry for discussion.