



final report

Project code: P.PSH.1147
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Date published: 31 December 2018

PUBLISHED BY
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NORTH SYDNEY NSW 2059

Evaluate, design and develop capabilities to replace NLIS Connect within Promptu software system – Final Report

This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

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Executive summary

A vertically integrated beef operation is currently assessing its data capture, transfer and management systems across its business. There are current limitations with the ability to the business to efficiently capture and transfer data throughout its supply chain. The ability to capture, and efficiently and accurately upload data to central areas such as the Company's head offices is critical for the integrity and compliance of the data showing livestock movements throughout its supply chain. Many of these challenges are common across the red meat supply chain, and this project aims to demonstrate a working solution that resolves data integration challenges specifically in relation to the interfacing of data with NLIS.

The purpose of this project was to evaluate, design and develop capabilities to replace the NLIS Connect application within Protrace's Promptu system through use of the NLIS web service interface. Integrity Systems Company (ISC) provide the Company with technical support through this project, and will partner with the Company to finalise the NLIS APIs for processor software integration to replace the existing SOAP XML technology. This project proposed to deliver necessary enhancements to the existing Livestock Management System (Promptu by Protrace Solutions) to integrate data across the Company's supply chains with NLIS, demonstrating a best practice integrated system.

The project objectives were successfully met with respect to the evaluation, design and development of NLIS Connect replacement capabilities within the Protrace System.

Significant improvements in data integrity and labour cost savings were observed over the period since the full implementation of the NLIS Connect Replacement Module with properties operated by the Company having reported 100% reconciliation of RFID devices reported on their holdings with NLIS. Additional benefits of the real-time interface of the NLIS Connect Replacement Module to the NLIS database is the ability to check the status animals (e.g. Residue Status, Lifetime Traceability) prior to or during transit so corrective action can be taken prior to ineligible animals leaving their property of origin of delivery of the consignment to the destination. Further benefits to the Company from this project are the upgrading their software interfaces to current generation web services enabling significantly improved supportability future-proofing in line with the current the NLIS database platform and interfaces.

Key messages from the project include:

- This project demonstrated that Information Technology projects can be successfully developed and implemented in on-line production environments across multiple supply chain sectors. This was achieved by thorough planning and project management by the Company in collaboration with the service provider (Protrace Solutions).
- Significant improvements in data integrity, and labour cost savings through improving software systems have been demonstrated.
- Significant benefits can be achieved through the successful implementation of real-time PIC and device status checks resulting in improved production efficiency, reduced costs and improved animal welfare.
- Upgrading systems to current web service technologies improves reliability and supportability of software systems and interfaced to NLIS and future-proofs the Company's systems in line with the current the NLIS database platform and interfaces.

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1 Background

A vertically integrated beef operation is currently assessing its data capture, transfer and management systems across its business. There are current limitations with the ability of the business to efficiently capture and transfer data throughout its supply chain. The ability to capture, and efficiently and accurately upload data to central areas such as the Company's head offices is critical for the integrity and compliance of the data showing livestock movements throughout its supply chain. Many of these challenges are common across the red meat supply chain, and this project aims to demonstrate a working solution that resolves data integration challenges specifically in relation to the interfacing of data with NLIS.

The purpose of this project is to evaluate, design and develop capabilities to replace the NLIS Connect application within Protrace's Promptu system through use of the NLIS web service interface. Integrity Systems Company (ISC) will provide the Company with technical support through this project, and will partner with the Company to finalise the NLIS APIs for processor software integration to replace the existing SOAP XML technology. This project will deliver necessary enhancements to the existing Livestock Management System (Promptu by Protrace Solutions) to integrate data across the Company's supply chains with NLIS, demonstrating a best practice integrated system.

2 Project objectives

The participant will achieve the following objective(s) to MLA's reasonable satisfaction. Capabilities within the following areas of the Promptu system are evaluated, designed and developed:

- 1) A new NLIS Integrator Service, a Windows service designed to run on the site server.
- 2) A new Livestock Console; specifically, the Carcass Monitor will be modified to provide the operator with the ability to export kill data directly to the NLIS website rather than to the NLIS Connect application on the site server.
- 3) The existing RFID Station, to support the ability to interface directly with the new local PIC and Device exception tables that the new NLIS Integrator Service will be populating.
- 4) The existing Grading Station, to provide a further exceptions check for animals transferred to the processor's current holding by the RFID Station, ensuring device exceptions have been retrieved from the NLIS website.
- 5) The existing "Configurator – Module Options: Kill Line – NLIS Integrator" tab, to include new additional options for the control of the new web service functionality along with new options to enable and disable the replacement NLIS Connect functionality.

3 Methodology

3.1 Approach

The Company's Information Technology personnel investigated and identified user requirements for the NLIS Connect Replacement Module. In collaboration with the Company's Information Technology, the provider (Protrace Solutions) undertook system design development and implementation plans for the replacement module. The provider evaluated the proposed replacement of the NLIS Connect application through the use of the NLIS web service interface and outlined areas of the existing

Promptu system that required modification. This involved evaluating new functionality in the following areas:

- The new NLIS Integrator Service will be a windows service designed to run on the site server
- The livestock Console, specifically the Carcass Monitor will be modified to provide the operator with the ability to export kill data directly to the NLIS website rather than to the NLIS Connect application on the site server.
- The RFID station will be modified to support the ability to interface directly with the new local PIC and Device exception tables the new NLIS Integrator service will be populating.
- The Grading station will be modified to provide a further exception check for animals that had to be transferred to the processors current holding by the RFID station to ensure any device exceptions have been retrieved from the NLIS website.
- The Configurator – Module Options: Kill Line – NLIS Integrator tab will be modified to include new additional options for the control of the new web service functionality along with new option to enabled and disable the replacement NLIS Connect functionality.

A User Requirements Specification was approved by the Company.

3.2 Project Stages

This project was divided into two major stages as outlined below.

3.2.1 Stage 1

Evaluate, design and develop capabilities to replace the NLIS Connect application within Protrace's Promptu system through use of the NLIS web service interface.

3.2.2 Stage 2

Write final report on the results of the evaluation, design and development work.

4 Results

4.1 Project objectives

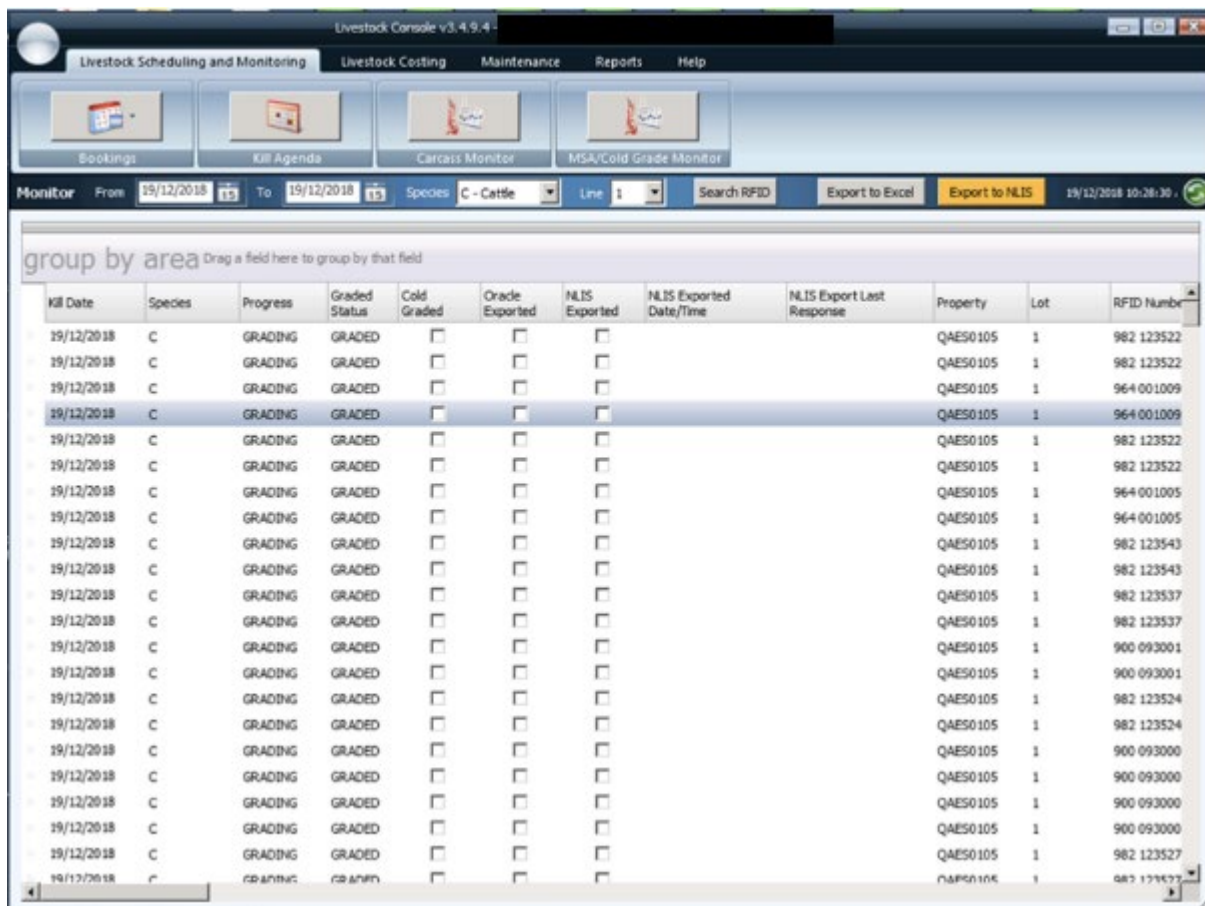
Screen shots demonstrating the successful achievement of each of the project objectives are outlined below.

4.1.1 A new NLIS Integrator Service, a Windows service designed to run on the site server.

ProTrace NLIS Integrator	Provide NLIS Integrator Services	Started	Automatic (D...	Local System
ProTrace Print Server		Started	Automatic (D...	.\Administ...

	LogID	ApplicationCode	ApplicationReference	LogType	LogMessage	UserID	DateCreated
1	933083	NLISINT	BEAST REQUEST	1	RFID:982 123530980590 NLISID:QGBI0408*BM07468 las...	4	2018-12-27 12:50:07.980
2	933082	NLISINT	BEAST REQUEST	1	NLIS UploadSOAP Time Lapsed: startOverallAt:27 Dec 20...	4	2018-12-27 12:50:07.970
3	933081	NLISINT	BEAST REQUEST	1	RFID:982 123526816527 NLISID:QAMI0001*BM96164 las...	4	2018-12-27 12:49:07.913
4	933080	NLISINT	BEAST REQUEST	1	RFID:982 123533675083 NLISID:QEWTO278*BN00111 la...	4	2018-12-27 12:49:07.907
5	933079	NLISINT	BEAST REQUEST	1	NLIS UploadSOAP Time Lapsed: startOverallAt:27 Dec 20...	4	2018-12-27 12:49:07.903
6	933078	NLISINT	BEAST REQUEST	1	RFID:942 000027227377 NLISID:QCM100132BN05580 las...	4	2018-12-27 12:48:07.940
7	933077	NLISINT	BEAST REQUEST	1	NLIS UploadSOAP Time Lapsed: startOverallAt:27 Dec 20...	4	2018-12-27 12:48:07.930
8	933076	NLISINT	BEAST REQUEST	1	RFID:982 123523845204 NLISID:QFNB0054*BM15910 la...	4	2018-12-27 12:47:07.930
9	933075	NLISINT	BEAST REQUEST	1	RFID:982 123543726750 NLISID:NC501927*BN23652 las...	4	2018-12-27 12:47:07.923
10	933074	NLISINT	BEAST REQUEST	1	NLIS UploadSOAP Time Lapsed: startOverallAt:27 Dec 20...	4	2018-12-27 12:47:07.917

4.1.2 A new Livestock Console; specifically, the Carcass Monitor will be modified to provide the operator with the ability to export kill data directly to the NLIS website rather than to the NLIS Connect application on the site server.



4.1.3 The existing RFID Station, to support the ability to interface directly with the new local PIC and Device exception tables that the new NLIS Integrator Service will be populating.

The screenshot displays the 'killfloor v1.5.8.0' service mode interface. At the top, it shows 'OnLine' status, 'Shift Date: 19/12/2018', 'Shift No.: 23', 'Line/Chain: 1', and the time '19/12/2018 10:31:14'. Below this is a 'Kill Schedule/Agenda' section with five lot cards and a 'Body No' field containing '251'. The lot cards are:

Lot No.	PIC	Oper.	Cat.	Target
6	[Redacted]	CC6	Mixed	0 of 72
5	[Redacted]	CC6	Mixed	0 of 78
4	QKMM0474	CC7	Mixed	4 of 78
3	[Redacted]	CC7	Mixed	78 of 78
2	[Redacted]	CC7	Mixed	78 of 78

The 'Body No' field is highlighted in green and contains the value '251'. Below the lot cards is the 'Carcass Data' section with fields for 'Eartag', 'RFID', 'Tall Tag/PIC' (set to 'QKMM0474'), and 'Suspect'. There are buttons for 'No Eartag', 'No Tag', and 'No Read'. The 'NLIS STATUS' section is currently empty. The 'Required Compliance' section shows 'Halal' and 'MSA' both set to 'Yes', and a large green 'Accept' button. The bottom of the interface shows the 'killfloor v1.5.8.0' logo and system tray icons.

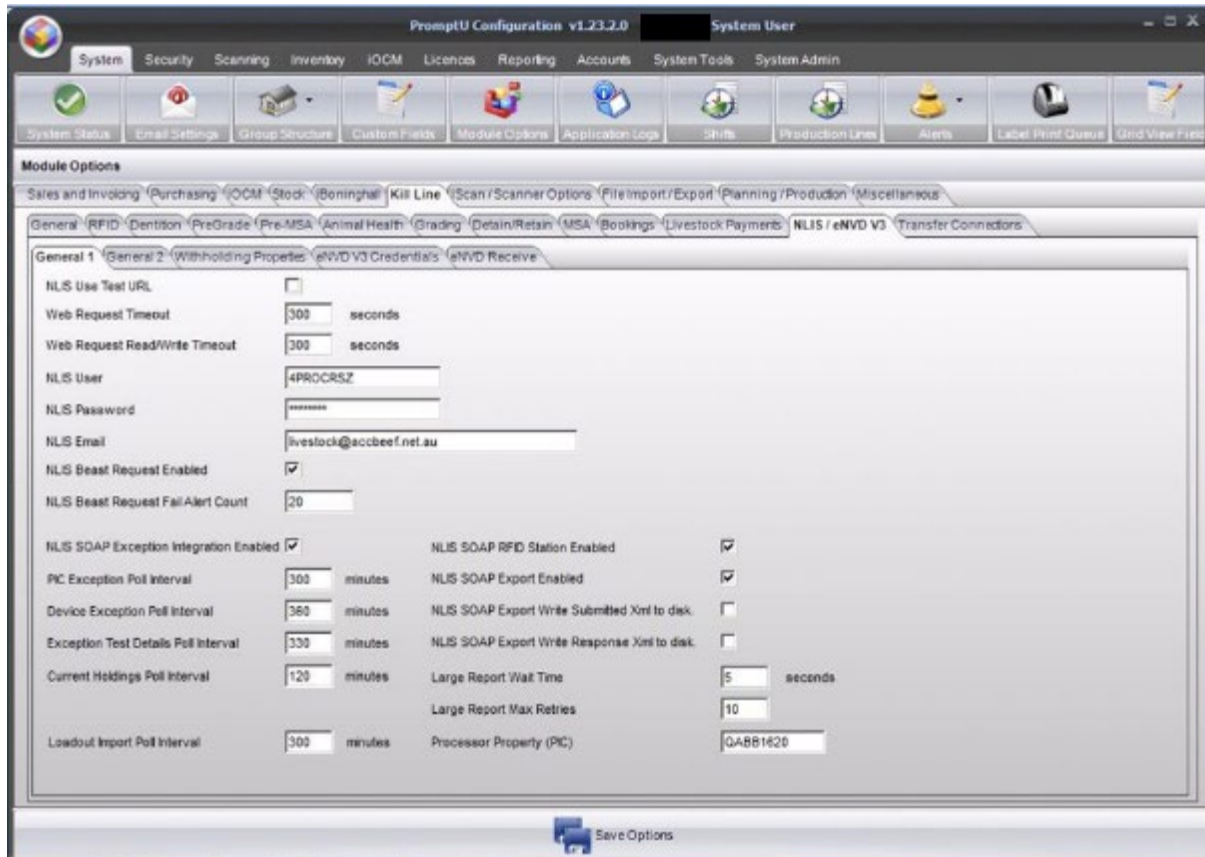
- + [Icon] dbo.Livestock_LiveWeight
- + [Icon] dbo.Livestock_MSAConfig
- + [Icon] dbo.Livestock_MSAGrade
- + [Icon] dbo.Livestock_MSAPBRTemplate
- + [Icon] dbo.Livestock_NationalCategory
- + [Icon] dbo.Livestock_NLIS_Connect_CurrentHoldings
- + [Icon] dbo.Livestock_NLIS_Connect_DeviceExceptions
- + [Icon] dbo.Livestock_NLIS_Connect_ExceptionTestDetails
- + [Icon] dbo.Livestock_NLIS_Connect_PicExceptions
- + [Icon] dbo.Livestock_NLIS_LastHolding
- + [Icon] dbo.Livestock_Operator
- + [Icon] dbo.Livestock_Parameter
- + [Icon] dbo.Livestock_PreMSA_BodyNumber
- + [Icon] dbo.Livestock_Reason
- + [Icon] dbo.Livestock_Rebate
- + [Icon] dbo.Livestock_SC_Product

4.1.4 The existing Grading Station, to provide a further exceptions check for animals transferred to the processor's current holding by the RFID Station, ensuring device exceptions have been retrieved from the NLIS website.

NLIS Beast Request Enabled	<input checked="" type="checkbox"/>
NLIS Beast Request Fail Alert Count	<input type="text" value="20"/>
NLIS SOAP Exception Integration Enabled	<input checked="" type="checkbox"/>
PIC Exception Poll Interval	<input type="text" value="300"/> minutes
Device Exception Poll Interval	<input type="text" value="360"/> minutes
Exception Test Details Poll Interval	<input type="text" value="330"/> minutes
Current Holdings Poll Interval	<input type="text" value="120"/> minutes
Loadout Import Poll Interval	<input type="text" value="300"/> minutes

Exceptions are updated to the local system's database on a regular basis and each animal is verified against that at knocking.

4.1.5 The existing “Configurator – Module Options: Kill Line – NLIS Integrator” tab, to include new additional options for the control of the new web service functionality along with new options to enable and disable the replacement NLIS Connect functionality.



4.2 Improved data integrity and cost savings

Over the 2 month period since the full implementation of the NLIS Connect Replacement Module, properties operated by the company have reported 100% reconciliation of RFID devices reported on their holdings with NLIS. In addition, this has been achieved with a reduction in labour.

4.3 Additional benefits of real-time device status checks

Additional benefits of the real-time interface of the NLIS Connect Replacement Module to the NLIS database is the ability to check the status animals (e.g. Residue Status, Lifetime Traceability) prior to or during transit so corrective action can be taken prior to ineligible animals leaving their property of origin of delivery of the consignment to the destination.

5 Discussion

5.1 Achievement of project objectives

The extent to which project objectives were met with respect to the evaluation, design and development of NLIS Connect replacement capabilities within the Protrace System are outlined below.

5.1.1 A new NLIS Integrator Service, a Windows service designed to run on the site server.

A new Windows service was developed and implemented on the site server. This integration enables real-time interaction with the NLIS data base allowing status checks and device movements to be conducted at all points along the Company's supply chain.

5.1.2 A new Livestock Console; specifically, the Carcass Monitor will be modified to provide the operator with the ability to export kill data directly to the NLIS website rather than to the NLIS Connect application on the site server.

Underpinned by the NLIS Integrator Service Windows Service developed and outlined in Section 5.1.1 above, a new Livestock Console was successfully developed and implemented. The new Livestock Console within the Protrace System enables the console operator the ability to export kill data directly to the NLIS website in real-time rather than to the NLIS Connect application on the site server that then interfaced to the NLIS system on a batch bases. The benefit of this is that it reduces the interfaces required and more importantly, provides real-time feedback to the operator of any issues enabling immediate corrective action to be taken. This is critical in on-line production environments where delays in corrective action can have significant impacts on production and can be extremely costly to rectify, particularly once ineligible product is mixed with broader production batches.

5.1.3 The existing RFID Station, to support the ability to interface directly with the new local PIC and Device exception tables that the new NLIS Integrator Service will be populating.

To support the on-line and real-time status checking and reporting of the RFID station, the NLIS Integrator Service as outlined in Section 5.1.1 above implemented new local PIC and Device Exception status tables. These tables are synchronised with current data on the NLIS database. The RFID Station was successfully modified to interface directly with new local status tables enabling on-line and real-time checking of PIC and Device status.

5.1.4 The existing Grading Station, to provide a further exceptions check for animals transferred to the processor's current holding by the RFID Station, ensuring device exceptions have been retrieved from the NLIS website.

Enhancements to the Grading Station were successfully developed and implemented to provide further exceptions check for animals transferred to the processor's current holding by the RFID Station. This ensures all device exceptions have been retrieved from the NLIS database and checks performed and issues identified and corrective actions performed prior to a carcass leaving the slaughter floor.

5.1.5 The existing "Configurator – Module Options: Kill Line – NLIS Integrator" tab, to include new additional options for the control of the new web service functionality

along with new options to enabled and disable the replacement NLIS Connect functionality.

In order to enable the smooth transition within the Protrace System from utilising NLIS Connect to the API based replacement, the “Configurator – Module Options: Kill Line – NLIS Integrator” tab was successfully enhanced. These include enhancements included new additional options for the control of the new web service functionality along with new options to enabled and disable the replacement NLIS Connect functionality. These modifications enabled the successful transition of the Company’s IT system from utilising batch-based NLIS Connect based interactions with the NLIS database to real-time web-services.

5.2 Additional benefits

In addition to the achievement of project objectives outlined in Section 5.1 above, additional benefits and observations are discussed below.

5.2.1 Improved data integrity and cost savings

Significant improvements in data integrity and cost savings were observed. Over the 2 month period since the full implementation of the NLIS Connect Replacement Module, properties operated by the Company have reported 100% reconciliation of RFID devices reported on their holdings with NLIS. In addition, a reduction of 1 FTE labour unit has been achieved at the processing facility with an estimated annualised saving of approximately \$104,000 (including on-costs) based on ABS Average Weekly Earnings May 2018 of \$1,586.20.

5.2.2 Additional benefits of real-time device status checks

Additional benefits of the real-time interface of the NLIS Connect Replacement Module to the NLIS database is the ability to check the status animals (e.g. Residue Status, Lifetime Traceability) prior to or during transit so corrective action can be taken prior to ineligible animals leaving their property of origin of delivery of the consignment to the destination. This can significantly reduce the cost of consignments being returned to their origin in addition to reducing handling and stress on animals and improving animal welfare. Further, any changes last minute changes to the availability of stock for slaughter can have significant impacts on production scheduling and the knock-on effect on supplying orders.

5.2.3 Improved maintenance and future proofing of NLIS Interfaces.

Software development undertaken in this project has utilised current generation web services and replaces batch-based NLIS Connect and SOAP XML technology. This means that the software systems in operation at the Company integrated with NLIS interfaces are readily supportable and provides future-proofing of the Company’s systems in line with the current the NLIS database platform and interfaces.

6 Conclusions/recommendations

The project objectives were successfully met with respect to the evaluation, design and development of NLIS Connect replacement capabilities within the Protrace System. Functionality was either enhanced or developed in the following areas:

- New NLIS Integrator Service operating on the will be a windows service designed to run on the site server.
- Carcass Monitor (Livestock Console) modified to provide the operator with the ability to export kill data directly to the NLIS database.
- RFID station modified to support interfacing directly with the new local PIC and Device exception tables populated by the NLIS Integrator service.
- Ensuring device exceptions have been retrieved from the NLIS website by the Grading station modification to provide a further exception check for animals transferred to the processors current holding by the RFID station.
- The Livestock Console Configurator modified to include additional options to enable transition from NLIS Connect to the new web service functionality.

Significant improvements in data integrity and labour cost savings were observed over the period since the full implementation of the NLIS Connect Replacement Module with properties operated by the having reported 100% reconciliation of RFID devices reported on their holdings with NLIS.

Additional benefits of the real-time interface of the NLIS Connect Replacement Module to the NLIS database is the ability to check the status animals (e.g. Residue Status, Lifetime Traceability) prior to or during transit so corrective action can be taken prior to ineligible animals leaving their property of origin of delivery of the consignment to the destination.

Further benefits to the Company from this project are the upgrading their software interfaces to current generation web services enabling significantly improved supportability future-proofing in line with the current the NLIS database platform and interfaces.

7 Key messages

Key messages from this project include:

- This project demonstrated that Information Technology projects can be successfully developed and implemented in on-line production environments across multiple supply chain sectors. This was achieved by thorough planning and project management by the Company in collaboration with the service provider (Protrace Solutions).
- Significant improvements in data integrity, and labour cost savings through improving software systems have bene demonstrated.
- Significant benefits can be achieved through the successful implementation of real-time PIC and device status checks resulting in improved production efficiency, reduced costs and improved animal welfare.
- Upgrading systems to current web service technologies improves reliability and supportability of software systems and interfaced to NLIS and future-proofs the Company's systems in line with the current the NLIS database platform and interfaces.