

INTERNATIONAL TROPICAL TIMBER ORGANIZATION

ITTO

TECHNICAL REPORT

PROJECT TITLE: ENHANCING FOREST LAW ENFORCEMENT IN PAPUA NEW GUINEA

REPORT TITLE: TECHNICAL REPORT ONE: *BASELINE SURVEY METHODS, FINDINGS AND RECOMMENDATIONS*

AUTHOR: DR. ROBERT TENNENT, SGS PNG LIMITED,
c/o Price Waterhouse Coopers,
6th Floor Credit House, Cuthbertson Street,
Port Moresby, Papua New Guinea

PROJECT NUMBER:	PD 449-07-REV 2
HOST GOVERNMENT:	GOVERNMENT OF PAPUA NEW GUINEA
EXECUTING AGENCY:	PNG FOREST AUTHORITY
PROJECT COORDINATOR:	TOM BUKON, NATIONAL FOREST SERVICE
STARTING DATE:	1 AUGUST 2010
DURATION:	24 MONTHS

CO-AUTHORS:	DEREK CHARTER, HELVETA (GB) LIMITED, 90 Milton Park, Abingdon, Oxon, OX14 4RY, United Kingdom SIMON ROLLINSON, PACIFIC ISLAND PROJECTS LIMITED, Allotment 20, Section 66, Page Street, Rabaul, Papua New Guinea
PLACE OF ISSUE:	PORT MORESBY, PAPUA NEW GUINEA
DATE OF ISSUE:	18 FEBRUARY 2011
DISCLAIMER:	THIS DOCUMENT REFLECTS THE OPINIONS OF THE AUTHORS AND NOT THAT OF ITTO, PNG FA, OR SGS.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS 2

1. INTRODUCTION..... 3

2. APPLIED METHODOLOGY 4

3. PRESENTATION OF THE DATA 4

4. RECOMMENDATIONS..... 4

Annexes 5

LIST of ABBREVIATIONS and ACRONYMS

FLEGT	Forest Law Enforcement, Governance and Trade
PNG	Papua New Guinea
PNGFA	Papua New Guinea Forest Authority
SGS	Société Générale de Surveillance

1. Introduction

In July 2010, SGS-PNG¹ was contracted by the PNGFA to deliver a pilot Forest Operation Management Information System supporting timber tracking applications, a FLEGT based legality standard and industry code-of-conduct, together with a forestry monitoring module for stakeholders. The following project implementation phases were established:

- PHASE1: Mobilization, Survey and Initial Consultations
- PHASE 2: System Configuration; Legality Standard and Industry Code of Conduct Development; Forestry Monitoring Module Development
- PHASE 3: System Roll-Out and Training of Key Stakeholders
- PHASE 4: Piloting and Sustainability
- PHASE 5: Final Consultation and Reporting

This technical report presents phase one's methods, findings and recommendations, and lays an agreed foundation for phase two of the project. The baseline surveys and initial consultations have enabled our consultants to precisely define the technical and functional requirements of the timber tracking system, and also to outline a cost-effective stakeholder consultation process for delivering an acceptable timber legality standard, industry code-of-conduct and forestry monitoring module. This information has been captured in a set of detailed planning documents to be reviewed and approved by the PNGFA before the project proceeds to the second phase of activities. These documents are presented in the annex section of the report and listed below:

- Roles and Responsibilities Matrix
- Detailed Technical Specifications
- Stakeholder Consultation Methodology

¹ In consortium with Helveta (GB) Ltd and Pacific Island Projects (PNG) Ltd.

2. Applied methodology

The following methods were used by the consultants to collect the required baseline data:

A series of informal meetings were held with both managers and technical officers at the PNGFA headquarters in Port Moresby as well as at the selected project site at Cloudy Bay in Central Province.

Inspections of existing systems and processes were carried out at the PNGFA headquarters in Port Moresby as well as at the selected project site at Cloudy Bay in Central Province.

A comprehensive review of the available literature was undertaken with regards to the tools, techniques and processes currently being used to control illegal logging activities and engage key stakeholders at both domestic and international levels.

3. Presentation of the data

The baseline survey has resulted in the preparation of five specific documents for review and signing-off by the PNGFA before the project proceeds to the second phase of activities. These documents are presented in the annex section and summarized below:

- The ROLES AND RESPONSIBILITIES MATRIX allocates PNGFA and SGS responsibilities for leading and supporting the completion of project deliverables.
- The DETAILED TECHNICAL SPECIFICATIONS capture the technical and functional requirements of the timber tracking system as well as the platform configuration requirements for meeting PNGFA and stakeholder specifications and industry practices. This includes the specifications of the network infrastructure, hardware, features and scope of the timber tracking system.
- The STAKEHOLDER CONSULTATION METHODOLOGY outlines the stakeholder consultation objectives, principles, participants and work-plan. A stakeholder database and online workspace have also been prepared in preparation for the consultation work which is scheduled to start in February 2011.

4. Recommendations

The following recommendations relate to the completion of phase activities.

1. Given the limited budget allocation for hardware, and based on SGS and Helveta's experience with similar pilot projects, it is strongly recommended to host the data at the Helveta facilities in the UK and to plan a migration of the system at the time of a subsequent national extension of the Forest Operation Management Information System. The ITTO pilot project would then be able to transfer to a future national system under a Build-Operate and Transfer model which allows for the gradual strengthening of PNG FA capacity to manage, operate and sustain the information system.

Annexes

Annex 1. Roles and Responsibilities Matrix

KEY:

L – Leads successful completion of deliverable.

S – Supports completion deliverable (responsibility for delivery can be delegated to).

R – Reviews the deliverable.

Project Activity	Organization	
	PNGFA	SGS
Server		
Server Hosting - Secure Enterprise Class Hosting Space (space, power, cooling, internet)		L
Domain Name Registration (renewal)		L
Security Certificate Procurement		L
Security Certificate Application		L
System Configuration		
Online configuration	S	L
Capture Mode configuration	S	L
MIME translations	S	L
User role confirmation	S	L
Functional Specification	S	L
Functional Specification Signoff	S	L
Report Specification	S	L

Testing		
Software Activation		L
Stress Testing		L
Unit Testing		L
System Testing		L
Acceptance Testing Schedule		L
Acceptance Testing Execution		L
Training and Support		
Train the trainer	S	L
End user training development	S	L
End user training delivery	S	L
Field Equipment support (HHC)		L
1 ST Line Support (Software)	S	L
2 nd Line Support (Software)	S	L
PDA/Field Equipment Roll Out		
PDA / Field Equipment specification		L
PDA / Field Equipment Setup and configuration	S	L
PDA / Field Equipment procurement		L
PDA / Field Equipment deployment (in country logistics and training)	S	L
Asset Tag		
Asset Tag procurement		L
Asset Tag roll out to growers		L

Travel, Transportation and Office Space		
International Duty Travel		L
Per Diem in Port Moresby for International Consultants		L
Local Transportation in Port Moresby for SGS, Helveta and PIP personnel		L
Office Space in Port Moresby	L	
Workshop Venue	L	S
Transportation to Pilot Sites in Papua New Guinea for SGS, Helveta and PIP personnel		L
All Accommodation and Meals on Project Sites for SGS, Helveta and PIP personnel		L
Transportation to Pilot Sites in Papua New Guinea for PNGFA personnel	L	
All Accommodation and Meals on Project Sites for PNGFA personnel	L	
Field Testing / Pilot Activities		
Overall Coordination of the Pilot	S	L
Coordination with Title Holders to Secure Participation to the Pilot	L	S
Nomination of Field PNGFA Officer to Participate in Field Trial	L	S

Annex 2. Summary of progress in development of software system

The implementation of the pilot timber products tracking, chain of custody verification and data management system by Helveta is to be achieved through a five phase plan. The first phase, the initiation or start-up phase, completed in August, is where the project governance structures were established, where the overall implementation plan was communicated to all stakeholders, where informational gaps were identified and filled and where project objectives were confirmed and reinforced. The first project kickoff meeting between all stakeholders was conducted on the 19th of August at the PNGFA headquarters and identified the members of each team from PNGFA, SGS, PIP and Helveta and the respective roles each carried.

The next project phase, Blueprinting, commenced immediately following the project kickoff meeting. This phase is the most critical part of a successful implementation as during this phase the specifics of the final system are identified. The first part of the Blueprinting phase involves the systematic gathering of process and operational information that will inform the design of the system. During this information gathering phase Helveta, with the support of SGS, conducted interviews, assembled source documentation and examined processes in the field. These activities took place in PNG from the 16th to the 31st of August and thereafter clarifications and additional material was collated from the UK. At the PNGFA office in Port Moresby, time was spent with operational personal from PNGFA, with the IT department, and with the planning team. Discussions were conducted with SGS staff to ascertain the current export processes, including the verification and inspection tasks conducted. A field visit to Cloudy Bay was organised to examine in detail the forest and processing operations. During the visit interviews with operational staff were completed, physical processes examined and source documentation collated. The processing operations examined included both the primary processing taking place at the forest site as well as secondary and final processing at the Cloudy Bay facility at 9 Mile in Port Moresby.

The second part of the Blueprinting phase involves the production of the system design documents. These documents are the output from the research conducted in the first part of blueprinting and are the documents that encapsulate the eventual system configuration and design. The draft specification has been completed and is included as Annex 4. Once the specification is agreed the technical configuration phase will commence. This phase, called Realisation, is where the design blueprints are used to configure the system according to the specifications. In order to remain on track it is important that all required counterparts review and agree the system design before configuration begins.

When the final system configuration has been completed, the Go-Live phase of the system will commence. This involves system training for all staff and the managed transition into full operation. The final phase is Operation. Go-live is currently planned for August 2011.

Annex 3. Stakeholder Consultation Methodology

Enhancing Forest Law Enforcement in PNG: *Stakeholder consultation objectives, principles, participants & work-plan*

Objectives

The stakeholder consultation component of the FLEG Project has set two clear objectives:

- *To exchange background information about the Project in a way that avoids raising expectations about what will be delivered (i.e. Outputs 1-4).*
- *To produce an acceptable Timber Legality Standard for PNG and Industry Code-of-Conduct, together with an acceptable Stakeholder Training Manual*

Principles

The stakeholder consultation component of the FLEG Project is guided by two agreed principles:

- *The consultation process should involve as large a proportion of stakeholders as possible;*
- *The consultation process should encourage consensus and understanding, rather than disagreement and confusion.*

Participants

The stakeholder consultation activities will be carried-out through the PNG Forest Authority and in consultation with the Project Steering Committee. Consultation activities will recognise existing organisational structures such as the Forest Industries Association and the PNG Eco-Forestry Forum. Particular attention will be paid to involve those stakeholders who have been involved with similar projects². Stakeholder representatives will be identified from the following groups:

- *Landowner representatives;*
- *Industry representatives (small, medium and large scale operators);*
- *Civil society representatives;*
- *Government representatives.*

Work Plan

The stakeholder consultation process will be carried-out with reference to the Detailed Implementation Plan and the Roles & Responsibilities Matrix. This process is summarised in the table below.

² For example, the ITTO-SGS: *TLTV Consultations*; the ITTO-PNGFA: *Regional Multi-Stakeholder Workshop on FLEG*; the EU-INA: *National Forestry Dialogue Workshop*.

Timeframe	Activities / Methods	Outputs
September 2010 to January 2011	<p>3.1.1 + 4.2.1: Preparation of consultation materials with NFS counterparts (i.e. Ben Taupa, Tom Bukon, Mark Betuels, Andrew Aopo, Alimel Bellet, Geno Kini and Fay Duega)</p>	<p>The PNGFA is ready to engage with stakeholders with reference to:</p> <ul style="list-style-type: none"> • Stakeholder database • Project brochure • Project e-bulletin • Scoping questionnaire • Draft newspaper articles and web-page/s (www.forestry.gov.pg) • Online workspace containing introductory materials, background information, and initial versions of the legality standard, industry code-of-conduct and stakeholder training manual for editing and comments • Draft national workshop programme
February 2011	<p>3.1.2 + 4.2.2: Initial scoping through:</p> <ul style="list-style-type: none"> • Face-to-face meetings with <u>selected stakeholders</u> in Port Moresby with reference to project brochure and scoping questionnaire, supplemented by email consultation. • Phone / fax / email consultations with <u>selected stakeholders</u> in other locations 	<p>Initial understanding reached with key stakeholders regarding:</p> <ul style="list-style-type: none"> • The project objectives, outputs and activities • The stakeholder consultation process • The scope of the PNG Timber Legality Standard and Industry Code of Conduct • The scope of the Stakeholder Training Module
March to May 2011	<p>3.1.3 + 4.2.3: Initial awareness through:</p> <ul style="list-style-type: none"> • Newspaper articles and web-site (www.forestry.gov.pg) information circulated for <u>all stakeholders</u> 	<p>Background information effectively communicated to a wide range of stakeholders regarding:</p> <ul style="list-style-type: none"> • Project objectives, outputs and activities • Stakeholder consultation process • Scope of the PNG Timber Legality Standard and Industry Code of Conduct • Scope of Stakeholder Training Module
March to May 2011	<p>3.4.1 + 4.3.1: Initial drafting through:</p> <ul style="list-style-type: none"> • Online project workspace managed for <u>selected stakeholders</u>³ with internet access, supplemented by email consultation. • Post / courier / fax consultations for <u>selected stakeholders</u> without internet access, supplemented by phone calls. 	<p>Key stakeholders are well-informed about timber legality objectives, issues and options leading to the joint preparation of the following documents:</p> <ul style="list-style-type: none"> • 1st draft PNG Timber Legality Standard and Industry Code of Conduct • 1st draft Stakeholder Training Manual • Issues Raised

³ Participants can be allocated different roles within the online project workspace (e.g. document reader / reviewer / co-author).

Timeframe	Activities / Methods	Outputs
June 2011	3.1.4 + 3.2 + 3.3: Document review through: <ul style="list-style-type: none"> • <i>Face-to-face national workshop for <u>selected stakeholders</u></i> 	Key stakeholders understand each other's different positions and consensus is reached regarding: <ul style="list-style-type: none"> • <i>Contents and layout of 2nd draft PNG Timber Legality Standard and Industry Code of Conduct</i> • <i>Contents and layout of 2nd draft Stakeholder Training Manual</i> • <i>The need for additional steps-to-be-taken after the FLEG Project</i>
June 2011	3.4.2 + 4.3.2 + 3.5 + 4.4: Second drafting through: <ul style="list-style-type: none"> • <i>Online project workspace managed for <u>selected stakeholders</u> with internet access</i> • <i>Post / courier / fax consultations for <u>selected stakeholders</u> without internet access.</i> 	Key stakeholders have checked and accepted the following documents for field-testing: <ul style="list-style-type: none"> • <i>2nd draft PNG Timber Legality Standard and Industry Code of Conduct</i> • <i>2nd draft Stakeholder Training Manual</i>
July to September 2011	3.6: Field-testing with: <ul style="list-style-type: none"> • <i><u>Selected stakeholders</u> at the FLEG Project's pilot-sites</i> 	Field-Test Findings regarding: <ul style="list-style-type: none"> • <i>Final draft PNG Timber Legality Standard and Industry Code of Conduct</i> • <i>Final draft Stakeholder Training Manual</i> • <i>The need for additional steps-to-be-taken after the FLEG Project</i>
October to November 2011	3.4.3 + 3.5 + 4.5: Final drafting through: <ul style="list-style-type: none"> • <i>Online project workspace managed for <u>selected stakeholders</u> with internet access</i> • <i>Post, courier, fax consultations for <u>selected stakeholders</u> without internet access.</i> 	Key stakeholders have checked and accepted the final draft documents for government gazettal: <ul style="list-style-type: none"> • <i>PNG Timber Legality Standard and Industry Code of Conduct</i> • <i>Stakeholder Training Manual</i> • <i>FLEG Action Plan (2012-2017)</i>
November to December 2011	3.1.3 + 4.2.3: Project awareness through: <ul style="list-style-type: none"> • <i>Newspaper articles and website (www.forestry.gov.pg) information circulated for <u>all stakeholders</u></i> 	Project outputs effectively communicated to a wide range of stakeholders regarding: <ul style="list-style-type: none"> • <i>PNG Timber Legality Standard and Industry Code of Conduct</i> • <i>Stakeholder Training Manual</i> • <i>FLEG Action Plan (2012-2017)</i>

Annex 4. Detailed Technical Specifications

(See following pages for Technical Specifications. Latest version as prepared February 2nd, 2011)



ITTO/SGS/PNGFA

Technical Specification v1.3

Commercial in Confidence

Contents

LIST OF ABBREVIATIONS AND ACRONYMS	2
1. INTRODUCTION.....	3
2. APPLIED METHODOLOGY	4
3. PRESENTATION OF THE DATA	4
4. RECOMMENDATIONS.....	4
<i>Annexes</i>	<i>5</i>
ITTO/SGS/PNGFA.....	1
TECHNICAL SPECIFICATION V1.3.....	1
1 DOCUMENT INFORMATION.....	5
1.1 DOCUMENT OWNER	5
1.2 VERSIONING METHODOLOGY.....	5
1.3 REVISION HISTORY	5
1.4 REVIEWS AND APPROVALS	6
1.5 GLOSSARY.....	7
2 PROJECT INFORMATION	7
2.1 PROJECT SUMMARY.....	7
2.2 PROJECT OBJECTIVES	8 9
2.3 SCOPE.....	8 9
2.4 PROPOSED SOLUTION	9 10
2.5 USER ROLES.....	11 12
2.6 DOCUMENT ORGANIZATION	12 13
3 HIGH LEVEL FUNCTIONS – SAWN TIMBER	1213
3.1 LOG SCALING	12 13
3.1.1 OPERATIONAL REQUIREMENTS	12 13

3.1.1.1	BUSINESS RULES	1415
3.1.1.2	REPORTS.....	1415
3.1.1.3	USERS	1516
3.2	LOG SCALING VERIFICATION	1516
3.2.1	OPERATIONAL REQUIREMENTS	1516
3.2.1.1	REPORTS.....	1617
3.2.1.2	BUSINESS RULES	1617
3.2.1.3	USERS	1617
3.3	ROYALTY ASSESSMENT APPROVAL.....	1617
3.3.1	OPERATIONAL REQUIREMENTS	1617
3.3.1.1	BUSINESS RULES	1718
3.3.1.2	USERS	1718
3.4	MILL YARD IN / CROSS CUT.....	1718
3.4.1	OPERATIONAL REQUIREMENTS	1718
3.4.1.1	REPORTS.....	1819
3.4.1.2	BUSINESS RULES	1819
3.4.1.3	USERS	1819
3.5	SAW MILL IN	1920
3.5.1	OPERATIONAL REQUIREMENTS	1920
3.5.1.1	REPORTS.....	1920
3.5.1.2	BUSINESS RULES	1920
3.5.1.3	USERS	1920
3.6	SAWN TIMBER BUNDLES PRODUCTION.....	1920
3.6.1	OPERATIONAL REQUIREMENTS	1920
3.6.1.1	REPORTS.....	2021
3.6.1.2	BUSINESS RULES	2122
3.6.1.3	USERS	2122
3.7	SAWN TIMBER BUNDLES DISPATCH AND RECEIPT (SAW MILL, JETTY, NINE MILE)	2122

3.7.1	OPERATIONAL REQUIREMENTS	2122
3.7.1.1	REPORTS.....	2223
3.7.1.2	BUSINESS RULES	2223
3.7.1.3	USERS	2223
4	HIGH LEVEL FUNCTIONS – ROUND WOOD	2223
4.1	LOG SCALING	2223
4.1.1	OPERATIONAL REQUIREMENTS	2224
4.1.1.1	BUSINESS RULES	2425
4.1.1.2	REPORTS.....	2425
4.1.1.3	USERS	2526
4.2	LOG SCALING VERIFICATION	2526
4.2.1	OPERATIONAL REQUIREMENTS	2526
4.2.1.1	REPORTS.....	2627
4.2.1.2	BUSINESS RULES	2627
4.2.1.3	USERS	2627
4.3	ROYALTY ASSESSMENT APPROVAL.....	2628
4.3.1	OPERATIONAL REQUIREMENTS	2628
4.3.1.1	BUSINESS RULES	2728
4.3.1.2	USERS	2728
4.4	LOG TRANSIT PROCESSES	2728
4.4.1	OPERATIONAL REQUIREMENTS	2729
4.4.1.1	REPORTS.....	2931
4.4.1.2	BUSINESS RULES	2931
4.4.1.3	USERS	2931
4.5	EXPORT PROCESSES	2931
4.5.1	OPERATIONAL REQUIREMENTS	3133

1 Document Information

1.1 Document Owner

Simon Bates – simon.bates@helveta.com

1.2 Versioning Methodology

The naming convention for all versions of this document should follow the standard below:

PNGFA Pilot Technical Spec v0.1

All versions are saved in the appropriate folder in the project library

1.3 Revision History

Changes made during each revision of the document are captured in the table below:

Revision Date	Author	Version	Descriptions of Changes
19/10/10	D. Charter	V1.1	First draft of document
15/12/10	D. Charter	V1.2	Draft incorporating comments from Bruce Telfer sent on email 10/12/10 and verbal feedback on conference call 13 th Jan 2011
02/02/11	S.Bates	V1.3	Draft Incorporating changes highlighted in Michel Trudelle minutes from the Technical Review meeting 20 th Jan 2011. 1.a Trimming at Export included in 4.5 and 4.5.1 1.c Added Unaccounted logs in to section 4.4.1 7.a Update 3.7.1.2 with default of 10 days 8.b Update Diagram (2.4) to reflect issuance of Log Export Licence 9.h Remove the word "Authority" Also changes identified during the handover of responsibility from Derek Charter to Simon Bates 1. Clarify the Roles mentioned throughout the document

			<p>2. Amend section 4 to remove reference to Mill yard</p> <p>3. Amend Flowchart to show Dispatch for Sawn timber after scaling</p> <p>4. Changed the wording in 3.1.1 for the method of recording defects</p> <p>5. in 3.1.1.2 and 4.1.1.2 modified the royalty rates to be a system provided value</p> <p>6. Amended 3.3.1.1 to say the system produce the Royalty Invoice Report</p> <p>7. Identified that it is best practice to synchronise at least once at the end of the day in 3.7.1.2</p> <p>8. Added in 4.5 and 4.5.1 a process to record the Log Export Licence Approval</p> <p>9. Remove duplication from Impending Shipment Information Sheet in 4.5.1</p>

1.4 Reviews and Approvals

Reviews and Approvals of the document are detailed in the table below:

Name	Position	Review or Approval	Date	Version
Bob Tennent	Forestry Manager SGS	Review		
Bruce Telfer	SGS Manager	Review	10/12/10	1.1

1.5 Glossary

Term / Abbreviation	Description
CoC	Chain of custody – refers to the physical process chain followed by the material assets involved in production.
Log Scaling	Legal process for the recording of harvested log details
SFM	sustainable forest management
ENGO	environmental non-governmental organisations
PNGFA	Papua New Guinea Forest Authority
SGS	Société Générale de Surveillance
ITTO	International Tropical Timber Organization
FLEGT	Forest Law Enforcement, Governance and Trade
SBLCL	Stettin Bay Lumber Company Limited

2 Project Information

2.1 Project Summary

Title – “Piloting of a Forest Operation Management Information System supporting timber tracking applications, definition of a legality standard & industry code of conduct, and stakeholders training legality control and monitoring for the PNGFA (Papua New Guinea)”

PNG is committed to achieving sustainable management of its forest resources. Over the years, PNGFA has developed and implemented forest laws and policies to assist in attaining the objectives of sustainable forest management (SFM). However, weak forest law enforcement, including the lack of effective monitoring of forestry operations due to inadequate local capacity, is undermining the efforts of the PNGFA to achieve SFM to meet the requirements of some of its key markets. This problem has been highlighted consistently in recent years in reports by several international and local environmental non-governmental organisations (ENGOs). A cost-effective forest law enforcement regime, complemented by enhanced capacity building for monitoring forestry activities, is now required to assure PNG’s markets of the legality of the sources of its timbers, as well as ensure the on-going effective implementation of PNG’s forest laws, regulations and policies to support its sustainable forest management strategies.

The project aims to enhance forest law enforcement and adequately support Papua New Guinea's SFM activities by:

- developing and implementing a cost-effective timber products tracking and chain of custody verification system, appropriate to the needs of the forestry sector in PNG;
- establishing a database on forest law enforcement, to assist in better monitoring forestry operations to detect illegal activities;
- enhancing the monitoring of forestry laws, policies and regulations to address illegal activities;
- developing and implementing standards including industry code of conduct for legal forestry activities and
- Enhancing capacity building for forest law enforcement among the key stakeholders.

Within the framework of the project, SGS will provide overall project management and field support at the time of the pilot, with Helveta supporting the configuration, deployment and support of the timber tracking system. Facilitating stakeholder's consultations and workshops as well as coordinating activities with regards to the elaboration of a legality standard and an industry code of conduct will be managed by PIP.

2.2 Project Objectives

To provide a complete and integrated delivery of ITTO project PD449/07 Rev.2.M.I including:

- A. end to end project management
- B. the specification, configuration and field-testing of a pilot timber tracking system and associated database based on a cost efficient off-the-shelf traceability platform in collaboration with key stakeholders
- C. a legality standard based on FLEGT guidelines and principles, as well as an industry code of conduct are developed for implementation in PNG in collaboration with key stakeholders
- D. a training module for enhancing the skills and expertise of key stakeholders on monitoring and control of forestry activities to detect illegal practices is developed and implemented

2.3 Scope

Following mobilization, a detailed survey in order to precisely define the technical and functional requirement of the timber tracking system as well as the configuration of the platform to meet PNGFA requirement was undertaken. The survey also looked at possible interfaces to existing systems as well as at reporting and information sharing requirements. Two supply chains with different operational aspects were selected as pilot sites, Cloudy Bay and SBLCL, and the scope of the field testing Phase was defined and agreed upon.

For Cloudy Bay the Chain of Custody that was identified within the system scope and agreed upon begins with the process of log scaling at the forest log pond and follows the production of sawn timber bundles up until the bundles arrive at the Cloudy Bay production facility at 9 Mile in Port Moresby. The CoC to be monitored contains the following links;



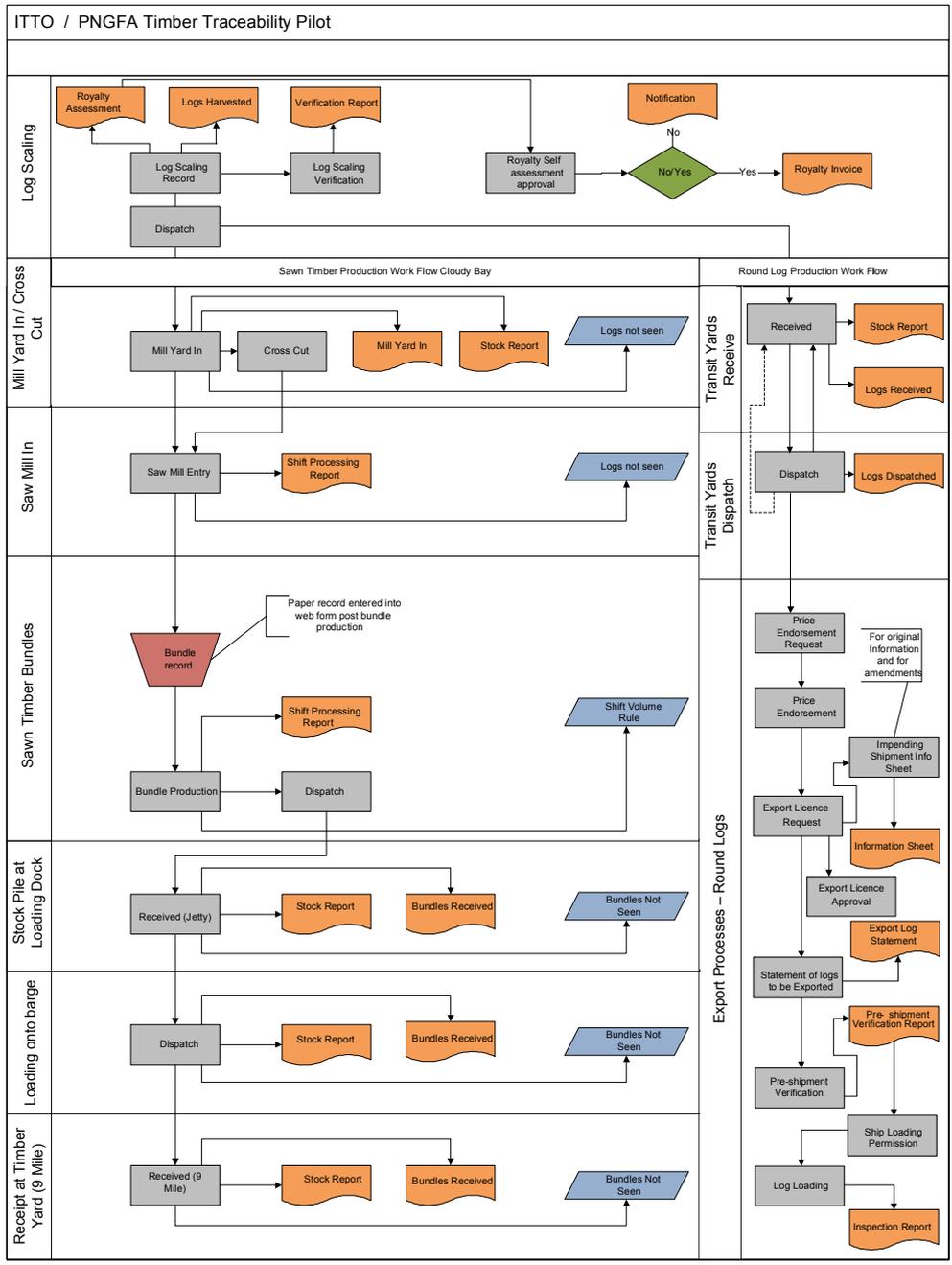
The CoC relating to the operation at the 2nd pilot site, SBLCL, concerns the preparation and export of round logs. As such, the process begins as it does for Cloudy Bay with log scaling, but then covers the transport of logs into and out of one or more intermediate Transit Yards, before finally terminating with the Export processes



The system will be developed to monitor the flow of material through these processes. This resulting specifications document describing the system will be signed off by the PNGFA and SGS and thus is the reference with regards to deliverable system features and functionalities, one of the Key Performance Indicators of the project being the availability of and online system matching the specifications.

2.4 Proposed Solution

The flow diagram below depicts the various interactions between the control points, operational activities and functional steps included in the system specification.



2.5 User roles

The system will contain the following configured roles and access rights.

Role	Mobile Data Forms	Web Data Forms	Report Access
Licensed Log Scaler	Log Scaling	Log Scaling	Log Scaling
PNGFA Project Supervisor	Log Scaling Verification	Ship Loading Permission	Log Scaling / Log Scaling Verification
PNGFA Provincial Forestry Officer		Royalty Assessment Approval	Log Scaling Verification / Royalty assessment / Royalty Invoice
PNGFA Head Office Forest Manager		Price Endorsement	All
Yard Manager	ST Bundle dispatch / ST Bundle receipt / Mill Yard in / Cross Cut / Transport Dispatch	ST Bundle dispatch / ST Bundle receipt / Mill Yard in / Cross Cut / Transport Dispatch	Sawn Timber Dispatch / Sawn Timber Receipt / Stock Report / Mill Yard IN
Loading Dock	Transport Receipt / Transport Dispatch	Transport Receipt / Transport Dispatch	
Saw Mill Manager	Saw Mill Entry	Saw Mill Entry	Shift Processing Report
Data Entry Clerk	Sawn Timber Bundles / Sawn Timber	Log Scaling / Sawn Timber Production / Saw Mill Entry / Transport Receipt / Transport Dispatch / ST Bundle dispatch / ST Bundle receipt / Mill Yard in / Cross Cut	Log Scaling / Sawn Timber Production
Operation Manager		Royalty Assessment	Royalty Assessment / Log Scaling / Log Scaling Verification / Sawn Timber Bundle Production / Sawn Timber Dispatch / Sawn Timber Receipt / Mill Receipt / Mill Yard In / Transport Receipt / Transport Dispatch
Export Clerk		Price Endorsement Request / Export Licence Request / Shipment Information Sheet / Statement of Logs	Inspection Report / Pre-shipment Verification report / Export Log Statement

		to be Exported	
SGS Export Inspector	Pre-shipment Verification / Log Loading	Pre-shipment Verification / Log Loading	Inspection Report / Information Sheet / Export Log Statement (Report and CSV)
Supervisor	All	All	All

2.6 Document Organization

The specifications are organised into 8 high-level functions;

- Log Scaling (incl Log Scaling Verification)
- Mill Yard in and Cross Cut
- Saw Mill Entry
- Saw Mill Output (production of sawn timber bundles) and transport
- Jetty Yard
- Transport
- Receipt at Timber Yard (9 Mile)
- Export Procedures (Round Logs)

For each of these modules an overview, operational requirements, process, users, and business rules will be specified.

3 High Level Functions – Sawn Timber

3.1 Log Scaling

After the tree is felled, the bole trimmed and cut to length and skidded from the forest to the forest log pond the resultant harvested log is marked with a bar-coded tag and its physical attributes recorded. This process is called Log Scaling. It is an important process for the calculation of royalty payments as well as to facilitate the control of log production levels for each Timber Permit to ensure that minimum production volumes are achieved and maximum levels are not exceeded.

3.1.1 Operational Requirements

The configuration for the system will provide for the Log Scaler to scan into the handheld computer device the log ID number and record the length and 4 under bark diameters as well as the species and any defects. The configuration will also include fields for the Timber Permit number, the Setup number and the Landowner Group name. The login details of the scaler and the date and time will be captured automatically.

Length is taken as the shortest distance between the two log faces. In accordance with the official procedure for log scaling, length is rounded down to the nearest lower tenth of a meter. However this rounding down will be down automatically in the system database. The Log Scaler simply enters the number of centimetres measured.

Comment: Technical Review Meeting. Meeting Minutes, January 20th, 2011. 9.h. remove Authority

Diameter is measured through the geometric centre of the cut face of the log then again at right angles to the first measurement. This is done at both ends. The data is entered into the relevant data capture fields on CI Mobile.

Alternatively the data can be recorded at first on paper in the field and then entered into the system through the configured web form.

Once synchronised with the database. CI World will then automatically calculate the volume of the log by application of the Brereton method for calculating volume. The formula to be used is as follows;

$$V = (0.7854 \times D^2 \times L) \div 10\,000$$

Where V = Volume in cubic meters
 D = Average diameter in centimetres
 L = Length in meters

$$D = (d_1 + d_2 + d_3 + d_4) \div 4$$

Where D = Average diameter in centimetres
 d₁, d₂, d₃ and d₄ = the four diameters measurements taken two at each end of the log at right angles

The Log Scaler will then select the species of the log from a configured pick list. As the list of available species contains a large number of items, CI Mobile will allow for the list to be searchable. This list can be maintained and kept up to date in the CI World database which will allow any changes to the available species list to be reflected on CI Mobile, following synchronisation.

The log scaling data capture mode will also include a number of fields for the recording of defects. Defects can be categorised in two basic categories, either "core" or "length". Core defects are separated into two types, those that are observed to run through the complete length of the log are designated as "full core" and those that are only visible at one end of the log are designated as "part core".

For "full core" defects the scaler will be required to enter four additional diameter measurements of the defect in the same way as for the external dimensions of the log.

Where "part core" is selected the scaler will be required to enter fields for only two diameter measurements for the defect that is visible.

Length defects (kinks, external growths or branch stubs) will require the Log Scaler to enter a field for the entry of the measured length of the defect as it runs along the span of the log.

After the data is synchronised the CI World system will calculate the volume of the defect using the same method described above for the overall log volume. To calculate the volume

of length defects the system will use the average length for the entire log, regardless of the position of the defect. For part core defects the system will calculate the defect as if it runs for half the length of the log.

For the calculation of net volume, and the subsequent preparation of the royalty assessment, the system will subtract the volume of the defect from the volume calculated using the external measurements of the log, giving the true commercial volume.

3.1.1.1 Business Rules

Logs that are entered into the system at scaling are expected to arrive at the mill yard in due course. The Technical specification for the mill yard arrival follows below, and describes how logs arriving from the forest log pond, post scaling, are recorded into the system. The system will continuously monitor this process and should a scaled log that has been recorded in the system not arrive at the mill yard after 7 days an automatic system issue will be raised.

The issue will be available to the Yard Manager and Operations Manager roles and will notify that a log expected to have arrived at the mill yard has not been recorded in the time expected. The alert will contain the log details (ID, species, measurements) as well as the date the log was recorded scaled.

3.1.1.2 Reports

Once the log scaling data is entered into CI Mobile and synchronised with the server. The system will be able to produce the following two reports.

- Log Scaling Report, this report is the report that shows the details of all logs scaled and can be filtered by date and, when the system is accessed with the appropriate security permissions, can be filtered by licensed Log Scaler. Report will show both gross and net volume.
- Royalty Assessment, this report is a modified version of the Log Scaling Report that includes a royalty calculation based on the following sum;

$$RP = HLV \times RR$$

Where: RP = Royalty Payment
 HLV = Harvested Log Volumes
 RR = Royalty Rate

The system will be configured to include the royalty assessment rates and the dates that they are effective from.

When running the report the user will select the date to identify the interval. The system will extract all the logs prior to and including this date which have yet to be assessed. The system will automatically apply the royalty rate to the logs within the date period. The output will include a summary with the date interval, the royalty rate, the operator details, the setup numbers included, the total log volumes and log volumes per clan/landowner, the total royalty due and the royalty due per clan/land owner. The report will then continue with a detailed breakdown for each log scaled in the assessment.

When first generated by the commercial operator, Royalty assessments have the status “pending”, the assessment can then be either approved or rejected by the PNGFA Provincial Forest Officer, at which point the assessment status will be designated as “approved” or “rejected”. Assessments can be retrieved from the system as either one of these 3 statuses.

3.1.1.3 Users

Only Licensed Log Scaler and Forest Manager roles will have access to the Log Scaling data entry mode. Reports will be accessible by the Licensed Log Scaler roles, the Forest Manager Role and the PNGFA Project Supervisor role. Log Scalers will only be able to access the Log scaling report and only for logs that they themselves scaled. Forest Manager will be able to access reports for Licensed Log Scalers within the same commercial operation only and the PNGFA Project Supervisor will have access to all reports for all Log Scalers

3.2 Log Scaling Verification

At a minimum of once a fortnight each licensed log scaler will be subject to a check on the logs scaled on that particular day. The PNGFA project supervisor conducts the check on a minimum of eight logs. This process is the Log Scaling Verification. The system configuration will include a specific data capture mode for the recording of Log Scaling Verifications.

3.2.1 Operational Requirements

The Log Scaling Verification mode contains the same data entry fields as the mode for the entry of log scaling information with the exception of the details for the log scaler, which is entered by the PNGFA Project Supervisor and not taken automatically from the login details. The details of the PNGFA Project Supervisor conducting the scaling check are however captured automatically from the supervisor’s login details. The system will be configured to capture the following data during Log Scaling Verification:

- Date (captured automatically)
- Time (captured automatically)
- PNGFA Project Supervisor (captured automatically from login details)
- Licensed Log Scaler
- Log ID number
- Species
- Length
- Diameter (4 total, 2 at each end)
- Defect type
- Defect length (for length defects)
- Defect Diameter (for core defects, 2 for part core defects 4 for full core defects)

3.2.1.1 Reports

Once the verification measurements and related data have been captured in CI Mobile and then synchronised, the system will be able to produce the;

- Log Scaling Verification Report, this report will show both the original declared measurements taken by the licensed log scaler and the measurements taken subsequently by the PNGFA Project Supervisor for every log checked. The report will highlight any individual measurements (length, diameter etc) with a difference of more than 10%. The Log Scaling Verification Report will also compare the calculated volume for each log and where a discrepancy of more than 3% is determined this will be highlighted.
The report will designate the verification as “FAILED” if the declared volume for all logs combined is more than 3% below the combined volumes for all logs checked for each verification cycle.
The Log Scaling Verification Report will be filtered on Date, PNGFA Project Supervisor ID and on Setup ID.

3.2.1.2 Business Rules

There are no specific business rules applied to the data for this stage.

3.2.1.3 Users

Only PNGFA Project Supervisors will have access to the Log Scaling Verification data capture mode. Log scaling verification reports will be available to PNGFA Project Supervisors, PNGFA Provincial Forestry Officer, Forest Manager and Operation Manager roles.

3.3 Royalty Assessment Approval

Once the Royalty Assessment Reports are produced there will be a requirement for the assessment to be approved. The approval is granted by the PNGFA Provincial Forestry Officer. For the purposes of the pilot it is expected that the PNGFA Provincial Forestry Officer will approve Royalty Assessments by comparing the conventional paper based self-assessments and supporting paper work with the system generated assessment.

3.3.1 Operational Requirements

The online system will be configured to enable the approval of Royalty Assessments by the PNGFA Provincial Forestry Officer. The PNGFA Provincial Forestry Officer will receive an automatic system notification when a commercial operator has generated a Royalty Assessment. The Notification will include the assessment number which the Officer will use to bring up the assessment in the system. Once approved the system will record the assessment as approved, however if the PNGFA Provincial Forestry Officer is unable to approve and instead rejects the assessment the system will record the assessment as having been rejected. In this case a system notification will be triggered for the attention of the commercial operator. Pending, approved and rejected assessments can be retrieved from

the system using the assessment ID. Approved Assessments will result in the generation of the Royalty Invoice Report.

Royalty Assessments that are subject to rejection by the PNGFA Provincial Forestry Officer result in the production of a Rejection Notification Report. The report functions as notification to the commercial operator that the assessment was rejected.

3.3.1.1 Business Rules

Once the Self Assessment is approved the system will generate the Royalty Invoice Report.

3.3.1.2 Users

The PNGFA Provincial Forestry Officer role will have system access to approve or reject royalty assessments. System access to approved, rejected or pending assessments will be granted to the PNGFA Provincial Forestry Officer and Operations Manager roles.

3.4 Mill Yard In / Cross Cut

After logs are scaled and subject to inspection at the forest log pond they are transported to the log yard at the mill. At this point logs are either stacked ready for milling as they arrived from the forest or are first cross cut into smaller logs before milling into sawn timber. The system will be configured to manage these processes as follows.

3.4.1 Operational Requirements

All logs will be scanned and recorded on arrival at the mill log yard. The mobile data capture mode for Mill Yard In will include only a single field for the log ID, but will also record the date and time as well as the user login details automatically. Once the logs are recorded as received, those logs that are first to be cross cut before milling will then be identified and the process tracked through the system. The reason for this is that once cross cut, the new resultant logs will have lost their ID barcodes and as a result will become untraceable.

The Yard Manager will have access to the Cross Cut data capture mode configured in CI Mobile for the purpose of recording the details of logs subject to cross cutting. The mode will contain a field for the ID of the parent log (the original log received from the forest after scaling) and a further ID field for each new log created through cross cutting. This will require that the new secondary logs be given new barcode tags when they are created.

As well as the ID of each new log the data capture form will also include fields for the new log measurements, including defects and for species. Log measurements and defects will be taken as per the configuration for log scaling. Two diameter measurements at right angles to each other on cut surface at either end of the log and the log length.

All logs produced through cross cutting are to be measured and recorded. For example if a 10m log is cross cut into a 4m log and two 3m logs all three logs are to be measured and data recorded into the system. This is so that when the logs are processed into sawn timber the volume of each log entering that process is known to the system and the volumes of timber produced can be reconciled with the logs entering the transformation process.

Defects are important and must be recorded for each log, however if at cross cutting defects are removed and disposed of, only the remaining sound logs that will enter the mill need be recorded. The system will not compare volumes of cross cut pieces with the original log scaled in the forest.

3.4.1.1 Reports

Following synchronisation of data captured on the CI Mobile application, the online system will be able to produce the Stock Report for the Mill Yard and Mill Yard In report

- *Stock Report – Mill Yard*, this report will show stock levels at the Mill Yard. The report will be filtered on date and so will show total stock at the Mill Yard at 00:00 hours on a given day and for each log will show the day the log was received or generated from cross cutting. For each cross cut log the report will also display the parent log from which the cross cut was derived. The report will be filtered on diameter class (3 groups 40cm – 49cm, 50cm- 59cm, 60cm and over) and so will show the total number of logs in each class at the yard per species.
- *Mill Yard In*, this report will show the total number of logs, total volume of logs and the specific log ID numbers for each log that was recorded received at the mill yard in a given date range.

3.4.1.2 Business Rules

Logs that are entered into the system at the mill are expected to enter the saw mill for transformation into sawn timber in due course. The functional specification for the saw mill entry follows below, and describes how logs arriving from the mill yard, are recorded into the system. The system will continuously monitor this process and should a log that has been recorded in the system at the mill yard not be recorded going into the saw mill after 10 days an automatic system issue will be raised.

The issue will be available to the Yard Manager and Operations Manager roles and will notify that a log expected to have arrived at the saw mill has not been recorded in the time expected. The alert will contain the log details (ID, species, measurements) as well as the date the log was recorded entering the mill yard. For cross cut logs the alert will reference the date of cross cutting and the date the parent log was recorded entering the mill yard.

3.4.1.3 Users

The Yard Manager and Operations Manager roles will have system access for the data entry modes for Mill Yard / Cross data capture and for accessing the stock report. Operations Manager and Yard Manager roles will be able to receive system notifications when the business rule described above is triggered.

3.5 Saw Mill In

Round logs are transformed into sawn timber at the saw mill. It is important to record the logs going into the mill process so that volume reconciliation can be applied against the material entering the mill and the sawn timber produced. The process and software specification to record logs as they are entered into the mill is as follows.

3.5.1 Operational Requirements

Before each log is sent into the mill for transformation into sawn timber the log ID will be entered in the configured CI Mobile data capture mode for saw mill entry. This mode will contain only one field for the log ID barcode, but will capture the date and time, as well as the device ID and user login details automatically. The system will also be configured with equivalent web form data entry modes for use if information is first recorded on paper and later entered into the system.

3.5.1.1 Reports

- *Shift Processing Report*, this report will be filtered on date range and will show the total volumes of wood entered into the saw mill within the range specified. The report will include the specific log ID numbers as well as sub totals for volumes per particular species within the date range.

3.5.1.2 Business Rules

There are no specific business rules applied to the data for this stage.

3.5.1.3 Users

The Saw Mill Manager and Operation Manager roles will have access to the mobile data capture mode for Saw Mill In. The Shift Processing report will be available to the Saw Mill Manager and Operation Manager roles.

3.6 Sawn Timber Bundles Production

The pieces of sawn timber emerge from the transformation process on a conveyor in non-uniform dimensions. In order to make up uniform bundles from the non-uniform timber, multiple bundles are built up at the same time. The pieces emerging on the conveyor are removed and placed with the appropriate bundle according to size. Due to the number of bundles and the pace of the operation it is not practical to enter the data into mobile hand held computers. For this reason the data for each bundle will be recorded on a paper form and entered into the online system at a later time. The system configuration for the production of sawn timber bundles from round logs follows the following design.

3.6.1 Operational Requirements

The data entry mode for sawn timber will be configured as a web form. Data will be entered by the operation's Data Entry Clerk in the office from a paper form which was filled in when the bundle was produced. The Saw Mill Manager will be equipped with bundle barcode tags which will be affixed to each bundle. The ID number from the tag will be transcribed onto the paper form and will uniquely identify the bundle. The web form will contain fields for

recording the breadth and length dimension measurements of each sawn timber piece. As each piece of sawn timber on a bundle is expected to be the same width (thickness) and of the same species, a field for width measurement or for species, is not required for each timber piece. However there will be a width and species field for the bundle which will be applied automatically to each timber piece in the bundle for the calculation of volume per species.

Although each bundle will usually contain timber of uniform length this will not always be the case and to accommodate timber pieces of different lengths within the same bundle each piece will have a field for length. The Data Entry Clerk will enter the bundle ID and each piece of sawn timber into the system. The paper form will also have the date the bundle was produced and the web form will have a corresponding field for date.

The system will then automatically calculate the total volume of each bundle, the total production volume for all bundles on a given day or date range and the total production volume for each species on a given day or date range. Volumes of sawn timber produced per day will be compared with the volumes per species entering the mill on the same day and any inconsistency beyond the agreed threshold will trigger a system alert. The volume reconciliation will apply a transformation ratio (TBD) to account for the material lost to the process (waste).

3.6.1.1 Reports

The system will produce a report detailing the production statics for a given date range. This will be the Bundle Production Shift Report.

- Bundle Production Shift Report, this report will show the total sawn timber production volumes per species for a given date range. The report will also include a calculation for the combined volumes of all species over the date range. The calculation for volume is as follows;

$$V_1 = L \times B \times W$$

Where: V_1 = Volume for each sawn timber piece
L = Length in centimetres
B = Breadth in centimetres
W = Width in centimetres

AND

$$V_t = V_1 + V_2 + V_2 + \dots + V_n$$

Where: V_t = Total Volume
 V_1, V_2, \dots = Volume for each sawn timber piece

3.6.1.2 Business Rules

After the production for each day is entered into the system the data will be subject to volume reconciliation. This rule will check to ensure the volumes going into the production per day, as entered during the Saw Mill In procedure, are equivalent to the post production volumes coming out. This calculation will be made for each species. The production process does not involve a daily clean down of the mill; therefore there will be material part way through transformation at the start of a given day that was recorded as going into the production on the previous day. It is understood that the additional material left over from the previous day will be balanced out by material remaining part processed at the end of the day. Nevertheless, the rule will expect volumes per species in and out per day to be within 15% (after the transformation ratio is applied) of each other. The transformation ratio accounts for the process waste. This ratio will be benchmarked during the implementation process and applied to the configuration once known.

If the process in and out volumes, per species, are inconsistent on a given by more than 15% on any one day an automatic system alert will be generated. This alert will be available to the Saw Mill Manger and Operation Manager roles.

3.6.1.3 Users

The web data entry form for sawn timber production is available to the Data Entry Clerk and the Operations Manager roles. The shift production report is available to the Operations Manager, the Saw Mill Manger and the Data Entry Clerk roles. The system alert is available to the Saw Mill manager and the Operations Manager roles.

3.7 Sawn Timber Bundles Dispatch and Receipt (Saw Mill, Jetty, Nine Mile)

Once the bundles of sawn timber are created they will be transported to the secondary production facility in Port Moresby. This is accomplished via barge transport along the coast. The first phase of the transport process involves the bundles being trucked to the jetty (barge landing site). On loading for transport to the jetty the ID barcodes for each bundle will be scanned into the configured Dispatch data capture mode in CI Mobile. When the bundles are unloaded at the jetty stock pile they will be scanned again as received. The bundles will remain at the jetty stock pile until they are loaded onto the barge for transport to the Nine Mile production facility in Port Moresby. Before loading on the barge the barcode ID for each bundle will be scanned as dispatched. Finally on arrival at the Nine Mile facility each bundle will be scanned as having been received.

3.7.1 Operational Requirements

The system will be configured with mobile data capture modes for sawn timber bundle dispatch and receipt. The same form will be used for all dispatching regardless of destination (to the jetty, on the barge etc) the distinction being made through the destination selection on a system dropdown field within the data capture mode.

Similarly the system will have only one receipt data capture form with a configured drop down selection field to denote the place of receipt. The dispatch and receipt data capture

forms will have fields for the bundle ID barcode and the destination (for dispatch) and location (for receipt). Along with these user-selected fields, the system will also capture the date, time, latitude and longitude coordinates (from the internal GPS), the device ID and the user login details automatically. GPS coordinates will not be mandatory.

3.7.1.1 Reports

Once the data captured into the handheld device, via CI Mobile has been synchronised the system will be able to produce a sawn timber stock report and the bundles received report

- Sawn Timber Stock Report, this report will contain details of all sawn timber bundles at the saw mill yard or jetty stock pile at 00:00 hours on a given day. The report will make this calculation by subtracting from the total of all bundles received at either location the bundles that have been recorded as dispatched from that location.
- Bundles Received, this report will show details for all sawn timber bundles recorded received between a selected date range and will show the used login ID current when the bundle was scanned.

3.7.1.2 Business Rules

Bundles that have been scanned into the system as dispatched to a particular destination will be expected to be recorded as arriving at the destination within 10 day. Where bundles are not recorded as being received one day after being dispatched, the system will trigger an automatic alert notification. This will require that the mobile handheld units where dispatch and receive information is captured be synchronised with the central database at a minimum of once at the end of the day.

Comment 552: Technical Review Meeting. Meeting Minutes, January 20th, 2011. 7.a. Change default to 10 days as default

3.7.1.3 Users

The data capture modes for dispatch and receive will be available to the Yard Manager and Operations Manager roles. The sawn timber stock report and Bundles received will be available to the Yard Manager and Operations Manager roles. The system notification for late bundles will be available to the Yard Manager and Operations Manager roles.

4 High Level Functions – Round Wood

4.1 Log Scaling

After the tree is felled, the bole trimmed and cut to length and skidded from the forest to the forest log pond the resultant harvested log is marked with a bar-coded tag and its physical attributes recorded. This process is called Log Scaling. It is an important process for the calculation of royalty payments as well as to facilitate the control of log production levels for each Timber Permit to ensure that minimum production volumes are achieved and maximum levels are not exceeded.

4.1.1 Operational Requirements

The configuration for the system will provide for the Log Scaler to scan into the handheld computer device the log ID number and record the length and 4 under bark diameters as

well as the species and any defects. The configuration will also include fields for the Timber Permit number, the Setup number and the Landowner Group name. The login details of the scaler and the date and time will be captured automatically.

Length is taken as the shortest distance between the two log faces. In accordance with the official procedure for log scaling, length is rounded down to the nearest lower tenth of a meter. However this rounding down will be done automatically in the system database. The Log Scaler simply enters the number of centimetres measured.

Diameter is measured through the geometric centre of the cut face of the log then again at right angles to the first measurement. This is done at both ends. The data is entered into the relevant data capture fields on CI Mobile.

Once synchronised with the database. CI World will then automatically calculate the volume of the log by application of the Brereton method for calculating volume. The formula to be used is as follows;

$$V = (0.7854 \times D^2 \times L) \div 10\,000$$

Where V = Volume in cubic meters
 D = Average diameter in centimetres
 L = Length in meters

$$D = (d_1 + d_2 + d_3 + d_4) \div 4$$

Where D = Average diameter in centimetres
 d₁, d₂, d₃ and d₄ = the four diameters measurements taken two at each end of the log at right angles

The Log Scaler will then select the species of the log from a configured pick list. As the list of available species contains a large number of items, CI Mobile will allow for the list to be searchable. This list can be maintained and kept up to date in the CI World database which will allow any changes to the available species list to be reflected on CI Mobile, following synchronisation.

The log scaling data capture mode will also include a number of fields for the recording of defects. The first of which will be a defect category selection from a drop down pick list. Defects can be categorised in two basic categories, either “core” or “length”. Core defects are separated into two types, those that are observed to run through the complete length of the log are designated as “full core” and those that are only visible at one end of the log are designated as “part core”.

If “full core” is selected the Log Scaler will be required to enter four additional diameter measurements of the defect in the same way as for the external dimensions of the log. Where “part core” is selected the scaler will be presented with fields for only two diameter measurements for the defect that is visible.

Length defects (kinks, external growths or branch stubs) will be accommodated by selection of “length defect” from the defect drop down pick list. Selecting length defect will cause the system to present a field for the entry of the measured length of the defect as it runs along the span of the log.

After the data is synchronised the CI World system will calculate the volume of the defect using the same method described above for the overall log volume. To calculate the volume of length defects the system will use the average length for the entire log, regardless of the position of the defect. For part core defects the system will calculate the defect as if it runs for half the length of the log.

For the calculation of net volume, and the subsequent preparation of the royalty assessment, the system will subtract the volume of the defect from the volume calculated using the external measurements of the log, giving the true commercial volume.

4.1.1.1 Business Rules

Logs that are entered into the system at scaling are expected to arrive at the intermediate transit yard in due course. The functional specification for the intermediate transit yard arrival follows below, and describes how logs arriving from the forest log pond, post scaling, are recorded into the system. The system will continuously monitor this process and should a scaled log that has been recorded in the system not arrive at the intermediate transit yard after 7 days an automatic system issue will be raised.

The issue will be available to the Yard Manager and Operations Manager roles and will notify that a log expected to have arrived at the intermediate transit yard has not been recorded in the time expected. The alert will contain the log details (ID, species, and measurements) as well as the date the log was recorded scaled.

4.1.1.2 Reports

Once the log scaling data is entered into CI Mobile and synchronised with the server. The system will be able to produce the following two reports.

- Log Scaling Report, this report is the report that shows the details of all logs scaled and can be filtered by date and, when the system is accessed with the appropriate security permissions, can be filtered by licensed log scaler.
- Royalty Assessment, this report is a modified version of the Log Scaling Report that includes a royalty calculation based on the following sum;

$$RP = HLV \times RR$$

Where: RP = Royalty Payment
 HLV = Harvested Log Volumes
 RR = Royalty Rate

The system will be configured to include the royalty assessment rates and the dates that they are effective from.

When running the report the user will select the date to identify the interval. The system will extract all the logs prior to and including this date which have yet to be assessed. The system will automatically apply the royalty rate to the logs within the date period. The output will include a summary with the date interval, the royalty rate, the operator details, the setup numbers included, the total log volumes and log volumes per clan/landowner, the total royalty due and the royalty due per clan/land owner. The report will then continue with a detailed breakdown for each log scaled in the assessment.

When first generated by the commercial operator, Royalty assessments have the status “pending”, the assessment can then be either approved or rejected by the PNGFA Provincial Forest Officer, at which point the assessment status will be designated as “approved” or “rejected”. Assessments can be retrieved from the system as either one of these 3 statuses.

4.1.1.3 Users

Only Licensed Log Scaler and Forest Manager roles will have access to the Log Scaling data entry mode. Reports will be accessible by the Licensed Log Scaler roles, the Forest Manager Role and the PNGFA Project Supervisor role. Log Scalers will only be able to access the Log scaling report and only for logs that they themselves scaled. Forest Manager will be able to access reports for Licensed Log Scalers within the same commercial operation only and the PNGFA Project Supervisor will have access to all reports for all Log Scalers

4.2 Log Scaling Verification

At a minimum of once a fortnight each licensed log scaler will be subject to a check on the logs scaled on that particular day. The PNGFA Project Supervisor conducts the check on a minimum of eight logs. This process is the Log Scaling Verification. The system configuration will include a specific data capture mode for the recording of Log Scaling Verifications.

4.2.1 Operational Requirements

The Log Scaling Verification mode contains the same data entry fields as the mode for the entry of log scaling information with the exception of the details for the log scaler, which is entered by the PNGFA Project Supervisor and not taken automatically from the login details. The details of the PNGFA Project Supervisor conducting the scaling check are however captured automatically from the supervisor’s login details. The system will be configured to capture the following data during Log Scaling Verification:

- Date (captured automatically)
- Time (captured automatically)
- PNGFA supervisor (captured automatically from login details)
- Licensed Log Scaler
- Log ID number

- Species
- Length
- Diameter (4 total, 2 at each end)
- Defect type
- Defect length (for length defects)
- Defect Diameter (for core defects, 2 for part core defects 4 for full core defects)

4.2.1.1 Reports

Once the verification measurements and related data have been captured in CI Mobile and then synchronised, the system will be able to produce the;

- *Log Scaling Verification Report*, this report will show both the original declared measurements taken by the licensed log scaler and the measurements taken subsequently by the PNGFA Project Supervisor for every log checked. The report will highlight any individual measurements (length, diameter etc) with a difference of more than 10%. The Log Scaling Verification Report will also compare the calculated volume for each log and where a discrepancy of more than 3% is determined this will be highlighted.
The report will designate the verification as “FAILED” if the declared volume for all logs combined is more than 3% below the combined volumes for all logs checked for each verification cycle.
The Log Scaling Verification Report will be filtered on Date, PNGFA Project Supervisor ID and on Setup ID.

4.2.1.2 Business Rules

There are no specific business rules applied to the data for this stage.

4.2.1.3 Users

Only PNGFA Project Supervisors will have access to the Log Scaling Verification data capture mode. Log scaling verification reports will be available to PNGFA Project Supervisors, PNGFA Provincial Forestry Officer, Forest Manager and Operation Manager roles.

4.3 Royalty Assessment Approval

Once the Royalty Assessment Reports are produced there will be a requirement for the assessment to be approved. The approval is granted by the PNGFA Provincial Forestry Officer. For the purposes of the pilot it is expected that the PNGFA Provincial Forestry Officer will approve Royalty Assessments by comparing the conventional paper based self-assessments and supporting paper work with the system generated assessment.

4.3.1 Operational Requirements

The online system will be configured to enable the approval of Royalty Assessments by the PNGFA Provincial Forestry Officer. The PNGFA Provincial Forestry Officer will receive an automatic system notification when a commercial operator has generated a Royalty Assessment. The Notification will include the assessment number which the Officer will use

to bring up the assessment in the system. Once approved the system will record the assessment as approved, however if the PNGFA Provincial Forestry Officer is unable to approve and instead rejects the assessment the system will record the assessment as having been rejected. In this case a system notification will be triggered for the attention of the commercial operator. Pending, approved and rejected assessments can be retrieved from the system using the assessment ID.

Royalty Assessments that are subject to rejection by the PNGFA Provincial Forestry Officer result in the production of a *Rejection Notification Report*. The report functions as notification to the commercial operator that the assessment was rejected.

4.3.1.1 Business Rules

There are no specific business rules applied to the data for this stage.

4.3.1.2 Users

The PNGFA Provincial Forestry Officer role will have system access to approve or reject royalty assessments. System access to approved, rejected or pending assessments will be granted to the PNGFA Provincial Forestry Officer and Operations Manager roles.

4.4 Log Transit Processes

Round Logs can transit through a number of intermediate transit points between the Scaling Log Pond and the eventual final destination. This destination can be the Export Wharf or processing plant and any individual log can be subject to a final destination change at any point in its progress through the supply chain.

To support improved operational control for companies and greater supply chain transparency for the administration, the system will be configured so that logs can be recorded in and out of each transit point. Also if a log becomes unaccounted for any reason the operator may remove this log from the supply chain.

4.4.1 Operational Requirements

Log Receipt: The system will include forms in both CI Mobile and Web format for the recording of logs that arrive at transit points. Web form input modes are available for use when information is first recorded on paper in the field and later entered into the online system.

Where CI Mobile is used to capture information only the location will need to be identified from the location drop down and the log barcode will need to be scanned. The hand-held computer will record the date and time, user login details and if available the GPS location.

Web forms will include fields for date and time, user and location as well as log ID code. Date and time is as per the date and time the log arrived at the transit yard and not when the data is subsequently entered into the system.

Log Dispatch: The system will include forms in both CI Mobile and Web format for the recording of logs as they are dispatched from transit points. Web form input modes are available for use when information is first recorded on paper in the field and later entered into the online system.

Where CI Mobile is used to capture information only the location will need to be identified from the location drop down, the destination from the destination dropdown and the log barcode will need to be scanned. The hand-held computer will record the date and time, user login details and if available the GPS location.

Web forms will include fields for date and time, user, location and destination as well as log ID code. Date and time is as per the date and time the log was dispatched from the transit yard and not when the data is subsequently entered into the system.

Logs Unaccounted: The system will include forms in both CI Mobile and Web format for the recording of logs that are being removed from the system, e.g. used by a contractor to build a bridge, fall off a lorry during transportation, or discarded due to quality reasons. Web form input modes are available for use when information is first recorded on paper in the field and later entered into the online system.

Where CI Mobile is used to capture information. The hand-held computer will record the date and time, user login details and if available the GPS location. The Log barcode will be scanned.

Web forms will include fields for date and time, user, location as well as log ID code. Date and time is as per the date and time the log was recorded and not when the data is subsequently entered into the system.

Transit Yard Registration: When logs are registered arriving at a transit point the user will select the location from a drop down. It will not be possible to allow a free text field where users can record the location because any variation in spelling or format will disrupt the reporting function. Although the pilot will involve only two operations and therefore will be able to function with the transit locations for each being essentially hardcoded, the system will be configured so that it can accommodate numerous operators in a national framework. This means that transit points will be registered by companies as required.

Once registered the transit point will be available for selection to be included in the Log Receipt and Log Dispatch forms. Each operator will only see yards locations that were registered by them in the system.

Log Transit Yards will be registered by means of a "Log Transit Yard Registration" web form. This form will include location information and a field for description. The information filed will be the name of the yard as it appears in the drop down.

4.4.1.1 Reports

Once information regarding the arrival and dispatch of logs into and out of transit points has been entered, the system will be able to produce the following reports.

- Stock Report, this report will show stock levels at the at each transit yard. The report will be filtered on date and so will show total stock at each yard at 00:00 hours on a given day and for each log will show the day the log was received. The report will be filtered on diameter class and so will show the total number of logs in each class (3 groups 40cm – 49cm, 50cm- 59cm, 60cm and over) at the yard per species.
- Dispatch Report, this report will show the list of logs dispatched from a specific Transit Yard filtered by date range.
- Log Location Report, this report will give the last known location for a log when the log ID is entered. The report will also display the previous known locations for the log.

4.4.1.2 Business Rules

There are no specific business rules applied to the data for this stage.

4.4.1.3 Users

Yard Managers as well as Operations Managers roles will have access to the data capture forms for Log Receipt and Dispatch as well as for Transit Yard Registration. The Operations Manager role will have access to the Stock Report and Log Dispatch Reports.

4.5 Export Processes

At the time of export logs may be trimmed, this will be performed by the Yard Manager and witnessed by the SGS Export Inspector, the original log barcode will be re-used.

At the time an exporter negotiates a sale of logs it is required that the exporter obtains an endorsement of the negotiated log prices before a sales contract is finalised. The endorsement is obtained by advising the PNGFA Head Office of the proposed volumes by species or species groups and the prices proposed. This process is the Price Endorsement Request.

For the export of market quality logs (fresh logs with an average diameter of 40 cm or more) formal endorsement of individual species prices are required for all species listed in Group 1 and average group prices are required for groups 2, 3, and 4. Prices are to conform to the prevailing market rate.

Old stock, reject stock or small logs which will not fetch the prevailing market rate are sold at a discount price.

Once the endorsement request is submitted online the system will automatically notify the PNGFA Head Office that a price endorsement request is pending and requires approval (or rejection). The PNGFA Head Office role will have system access to retrieve the specific price endorsement request and either approve or reject the request. Both approved and rejected requests result in notification being sent to the operator accordingly. If the request is

rejected the exporter will not be able to apply for a Log Export Licence and will have to resubmit the request with revised prices. If the request is approved the exporter must complete a submission for a Log Export Licence to the PNGFA Head Office.

The system will be configured with a data capture mode for the submission of applications of log export licences. The volumes per species and prices on the application must be the same as the details for the price endorsement.

Following the application for a Log export Licence the exporter is obliged to notify SGS of the impending shipment. This is so SGS can plan the scheduling of inspections in an efficient manner. The notification of the impending shipment will be completed online through the *Impending Shipment Information Sheet*. Any changes to the shipping schedule that arise after the information sheet has been sent by the exporter and acknowledged by SGS are to be reflected through the use of the *Impending Shipment Information Amendment Sheet*.

The next system supported export process to be configured in the system is the preparation of the *Statement of Logs to be Exported*. This statement lists all the log ID numbers to be included in the export shipment in numerical order and for each log lists the species, length measurement, calculated net volume (gross volume minus the defect allowance) and the defect volume (if any). The Statement of Logs to be Exported will be available for download as CSV file so it can be imported into the SGS inspection system.

Once the Statement of Logs to be Exported is produced, SGS will conduct the Pre-Shipment Inspection. This inspection will confirm that the Statement of Logs to be Exported matches the composition of the permitted shipment as per the Log Export Licence request (within 10% total volume per species), that the species listed on the Statement of Logs to be Exported are correct for the logs to be exported and that a 10% random sample of the consignment is dimensionally as per scaled. Failed pre-shipment inspection will result in a Discrepancy Notice.

The PNGFA Head Office role will have system access to retrieve the specific Log Export Licence request and either approve or reject the request. Both approved and rejected requests result in notification being sent to the operator accordingly. If the request is rejected the exporter will not be able to produce an Impending Shipment Information sheet nor a Statement of logs to be Exported. They must resubmit the request. If the request is approved the exporter can proceed to submit the Impending Shipment Information sheet and a Statement of logs to be Exported.

If the pre-shipment inspection does not result in a discrepancy notice the PNGFA Project Supervisor will provide permission to commence ship loading. The system will include a web form input mode for the ship loading permission.

Once SGS have received a copy of the permission to commence ship loading the ship may be loaded and SGS will tally the logs loaded on board the ship. The production of the tallies will occur in the SGS system as normal. The SGS system will prepare the Inspection Report. This report includes details of the volume loaded in the shipment by species for group 1 species and summaries by species group for species group 2, 3 and 4. This report will be exported as

a CVS by the SGS system and the CI World system will be configured to upload the report from the SGS system. The CI World system will be configured with the CSV upload function to receive the report data from the existing SGS system but the preparation of the CSV will be the responsibility of the existing SGS system.

4.5.1 Operational Requirements

Log Trimming: The system will include forms in both CI Mobile and Web format for the recording of trimming of logs prior to export. Web form input modes are available for use when information is first recorded on paper in the field and later entered into the online system. Trimming is the reduction in dimension of a single log, re-using the original barcode.

Where CI Mobile is used to capture information the original log barcode will need to be scanned, the witnessing SGS Export Inspector name and the new dimensions recorded. The hand-held computer will record the date and time, user login details and if available the GPS location.

Web forms will include fields for date and time, user and location as well as the original log ID code, witnessing SGS Export Inspector name and the new dimensions recorded. Date and time is as per the date and time the log was trimmed not when the data is subsequently entered into the system.

All processes at export will use the new trimmed volume, therefore trimming must occur prior to then.

Price Endorsement Request: The system will be configured to include a web data capture form for the capture of Price Endorsement Requests. This form will contain the following fields;

- Exporter Name
- Buyer name
- Buyer Address
- Destination Country
- Vessel
- Vessel ETA
- Project
- Product Name (species)
- Proposed Unit FOB Price
- Quantity in m³
- Total Price
- Old Stock
- Reject Logs
- Small Logs

For price endorsements requests for sale of old, reject or small logs or for mixed shipments of market quality logs and old, reject or small logs the request for endorsement must be accompanied by a letter from the PNGFA Project Supervisor confirming the number of logs and their volume for each category (old, reject or small). The data entry web form will have upload function where a scanned image of the letter can be attached.

Price Endorsement Approval: Submission of a request for price approval by the exporter will result in a system notification to the PNGFA Head Office system role. The notification will contain the notification number and using the request number the PNGFA Head Office will be able to retrieve the details of the request and download the PNGFA Project Supervisor supporting letter, if one has been uploaded.

The PNGFA Head Office will then be able to approve or reject the request. Approved requests will result in a system notification to the exporter informing that the request has been approved. Rejected requests will result in a system notification being sent to the exporter informing that the request was rejected.

Log Export Licence Approval: Submission of a request for Log Export Licence approval by the exporter will result in a system notification to the PNGFA Head Office system role.

The PNGFA Head Office will then be able to approve or reject the request. Approved requests will result in a system notification to the exporter informing that the request has been approved. Rejected requests will result in a system notification being sent to the exporter informing that the request was rejected.

Log Export Licence Application: After receiving the price endorsement notification the exporter will be able to apply for a log export licence from the PNGFA Head Office. The system will be configured with a web form data capture form for the application of Log Export Licences. The form will contain fields for the full details of the proposed shipment including volume of species, for group 1 species, or volumes of species groups for species in group 2, 3 or 4 and prices by species for group 1 species or by species group for species in group 2, 3 or 4. The web form data capture mode for the Log Export Licence application will include a price endorsement number field and the Export Clerk will be required to enter the number of the price endorsement so the export request can be checked for consistency with the price endorsement previously granted. The completion and submission of a log export licence application will result in a system notification for the attention of the PNGFA Head Office.

Impending Shipment Information Sheet: The system will be configured with a web form data capture mode for the production of Impending Shipment Information Sheets. The form will contain the following fields;

- Contact name
- Export Licence No.
- Destination Country
- Agent and Contract
- Species or S. Group
- Freight Rate
- Special Requirements
- Exporter
- Contact Phone No.
- Buyer Name
- Destination Port
- Vessel ETA
- Price
- Date
- Log Yard Location
- Information Sheet No.
- Buyer Address
- Vessel Name
- Volume
- Total Volume

Once the information sheet web form is completed and submitted an automatic system notification will be triggered and made available to the SGS Export Inspector role. The notification will include the information sheet number which the SGS Export Inspector will use to retrieve the information sheet details.

Amendments to the information sheet can be made after it is first submitted by using the information sheet number and then editing the details. Submitting edited details will result in a further notification being sent to the SGS Export Inspector informing that an amendment has been made.

Statement of Logs to be Exported: The system will be configured to include a web form data capture mode for the production of the Statement of Logs to be Exported. The data capture form will include fields for the name of the ship, the timber permit number, the planned sailing date of the vessel, the log export site and the log ID numbers in sequential order. The system will automatically add the species code, log length, average diameter, net volume and any volume defect from the details already submitted at scaling. The form will automatically calculate the total number of logs, total net volume and total defect volume. Date, time and login details (user) will be automatically captured and included on the Statement of Logs Exported Report. The submission of a Statement of Logs Exported will result in an automatic system notification being triggered that will alert the SGS Export Inspector. The SGS Export Inspector will be able to retrieve the Statement of Logs to be Exported for viewing and printing.

Pre-Shipment Verification: The system will be configured to support the pre-shipment verification process by automatically reconciling the submitted log volume data per species for species group 1, and per species group, for species groups 2, 3 and 4 in the Statement of Logs to be Exported against the log volume data per species for species group 1, and per species group, for species groups 2, 3 and 4 in the Log Export Request.

It is expected that the final volumes to be exported will not exactly match the volumes on the export licence request. For this reason a 10% tolerance will be applied for each species in group 1 and for each species group for species in groups 2, 3 and 4.

As well as the automatic reconciliation between the log volumes on the Statement of Logs to be Exported and the Log Export Licence Request the system will also be configured with a CI Mobile data capture mode for the recording of species information for all logs to be exported. The system will automatically compare the species identified by the SGS inspector against the species declared at scaling and included on the Statement of Logs to be exported for consistency.

The SGS Export Inspector will also have access to the CI Mobile scaling verification capture mode on the handheld computer. This mode will be for the verification of a random 10% sample of logs to be exported for correct scaling.

If any of these checks fail the system will trigger an automatic alert informing the SGS Export inspector so that a discrepancy note can be issued.

Ship Loading Permission: If all the pre-shipment inspection checks are passed a system notification will be sent to the PNGFA Project Supervisor with the Pre-Shipment Verification Report ID. The PNGFA Project Supervisor can then download the report and the system will be configured to include a web form data entry mode for the issuance of ship loading. This data entry mode will include fields for the individual or organisation receiving the permission to load, the name of the ship, the products to be loaded and the quality. The date and the login details for the PNGFA Project Supervisor will be automatically captured by the system. Once the PNGFA Project Supervisor has submitted his permission to load the ship, an automatic system notification will be issued to the relevant exporter and to the SGS Export Inspector.

Log Loading Inspection: Once the Ship Loading Permission has been granted and the loading is to commence the SGS Export Inspector will conduct the inspection of log loading and will tally the logs loaded on board the ship. The production of the tallies will occur in the SGS system as normal. The SGS system will then prepare the Inspection Report. This report includes details of the volume loaded in the shipment by species for group 1 species and summaries by species group for species group 2, 3 and 4. This report will be exported as a CVS by the SGS system and the CI World system will be configured to upload the report from the SGS system. The CI World system will be configured with the CSV upload function to receive the report data from the existing SGS system but the preparation of the CSV will be the responsibility of the existing SGS system.

The Log Loading Inspection Report will include the following fields;

- Exporter
- Export Permit No.
- Yard Contact
- Species
- Total No. Logs
- Vessel Name
- Export Licence No.
- Pre-shipment inspection date
- Pieces
- Total Volume
- SGS reference
- Yard Location
- Loading Inspection date
- Volume
- Inspector name