SALT TECHNICAL OPERATIONS

PROJECT STATUS REPORT

TITLE: STATUS REPORT: PF GUIDANCE SYSTEM UPGRADE PROJECT BOARD MEETING # 38 ON 9 – 11 NOVEMBER 2015

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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
ATP	Acceptance Test Procedure
CDR	Critical Design Review
CER	Concept Evaluation Review
COTS	Commercial Off The Shelf
CoC	Certificate of Conformance
DPC	Direct Project Cost
ECR	Engineering Change Request
FAT	Factory Acceptance Test
FDR	Final Design Review
FEA	Finite Element Analysis
FIF	Fibre Instrument Feed
FMECA	Failure Mode, Effects and Criticality Analysis
PDM	Product Data Management
PDR	Preliminary Design Review
RSS	Robert Stobie Spectrograph
UI	User Interface

DEFINITIONS

Milestone	A milestone is an intermediate objective that defines an important, measurable event in the project, and represents a result that must be achieved at that point.
Program	A Program is a named, unlimited/long duration and budgeted undertaking for which long term goals have been established. It is continuous and requires the establishment of a permanent organization. Programmes may consist of numerous Projects.
Project	A Project is a named, time-limited and budgeted undertaking for which goals have been established. It is non-recurrent and requires the establishment of a temporary organization.
Project Plan	Is a document consisting of a project and team specification and includes a quality plan.
Project Specification	Forms a part of the Project Plan that contains the Project Objectives, Organization, Master Schedule, Costing, Risks, etc.
Stage	A Stage is the defined time period between two tollgates in a project.
Team Specification	Forms a part of the Project Plan that contains the Project Team's Roles & Responsibilities, Team Schedule, Costing, etc.
TOG	Tollgate is defined as the start and the end of a stage in a project that must be passed in order for a project to continue. It is usually dependant on a technical or business decision.

1. Project Scope Statement

The SALT Prime Focus (PF) Guidance System Upgrade project will deliver an upgraded guidance probe at the RSS instrument port.

2. Project Goal

The goal is to upgrade the existing RSS guidance probe using the technology and lessons learnt from constructing the Fibre Instrument Feed (FIF) and its guidance probe. The aim is to significantly improve optical throughput (recent testing on the FIF probe indicated successful guidance on a V20 guide star with 15-second exposures), add rotational guidance functionality (using two guide stars) and include active focus guidance capability. These upgrades will allow significant enhancement in the quality of science data taken with the RSS instrument.

The project comprises four main work areas:

a) Positioner: Mechanical development of a two-probe positioning system mounted to the RSS instrument
b) Imagers: Optical design of pick-off systems to relay the telescope focal plane to the detectors (based on the FIF design)
c) Control system hardware: Selection and electronic integration of the motion control platform
d) Control system software: Software development of motion control and image processing systems

An additional goal of the project is to establish in-house optical engineering capabilities and processes. Janus Brink has been earmarked by the SAAO Director for this role on this project. To accommodate this, some of his software load will have to be delegated to someone else. Stephen Hulme is the ideal candidate for this software task since he has been involved in the new guider project since its inception.

3 Project Stages, Tollgates and Milestones

A summary of the project stages, “toll-gates” and milestones are shown below. Three main stages are defined, starting with the concept design, continuing into detail design and culminating in the manufacturing, assembly and testing stage.

Project Stages	Project Tollgates	Project Milestones	Description
Stage 0	**TOG 1**		**- Project ‘Kick-Off’**
Stage 1	**TOG 1 to 2**		**Concept Design**
		Milestone A1	- Review: CER Positioner
		Milestone B1	- Review: CER Imager
		Milestone C1	- Review: CER Control and Communication
		Milestone D1	- Review: Software Concept Review
Stage 2	**TOG 2 to 3**		**Detail Design and Coding**
		Milestone A2	- Review: PDR Positioner
		Milestone B2	- Review: PDR Imager
		Milestone C2	- Review: PDR Control and Communication
		Milestone D2	- Review: Software Design Review
		Milestone A3	- Review: CDR Positioner
		Milestone B3	- Review: CDR Imager
		Milestone C3	- Review: CDR Control and Communication
Stage 3	**TOG 3 to 4**		**Manufacturing, Assembly and Test**
		Milestone A4	- Test: Positioner Functional Test
		Milestone B4	- Test: Imager Functional Test
		Milestone C4	- Test: Control and Communications Functional Test
		Milestone D4	- Test: Software FAT
		Milestone E	- Integration: Positioner and Imager
		Milestone F	- Integration: Control System and Hardware
		Milestone G	- Test: UI Software FAT
		Milestone H	- Test: System FAT
		Milestone I	- Review: Installation Readiness
		Milestone J	- Installation and commissioning
		Milestone K	- Test: System ATP
Stage 4	**TOG 4 to 5**		**- FDR, Close Project**

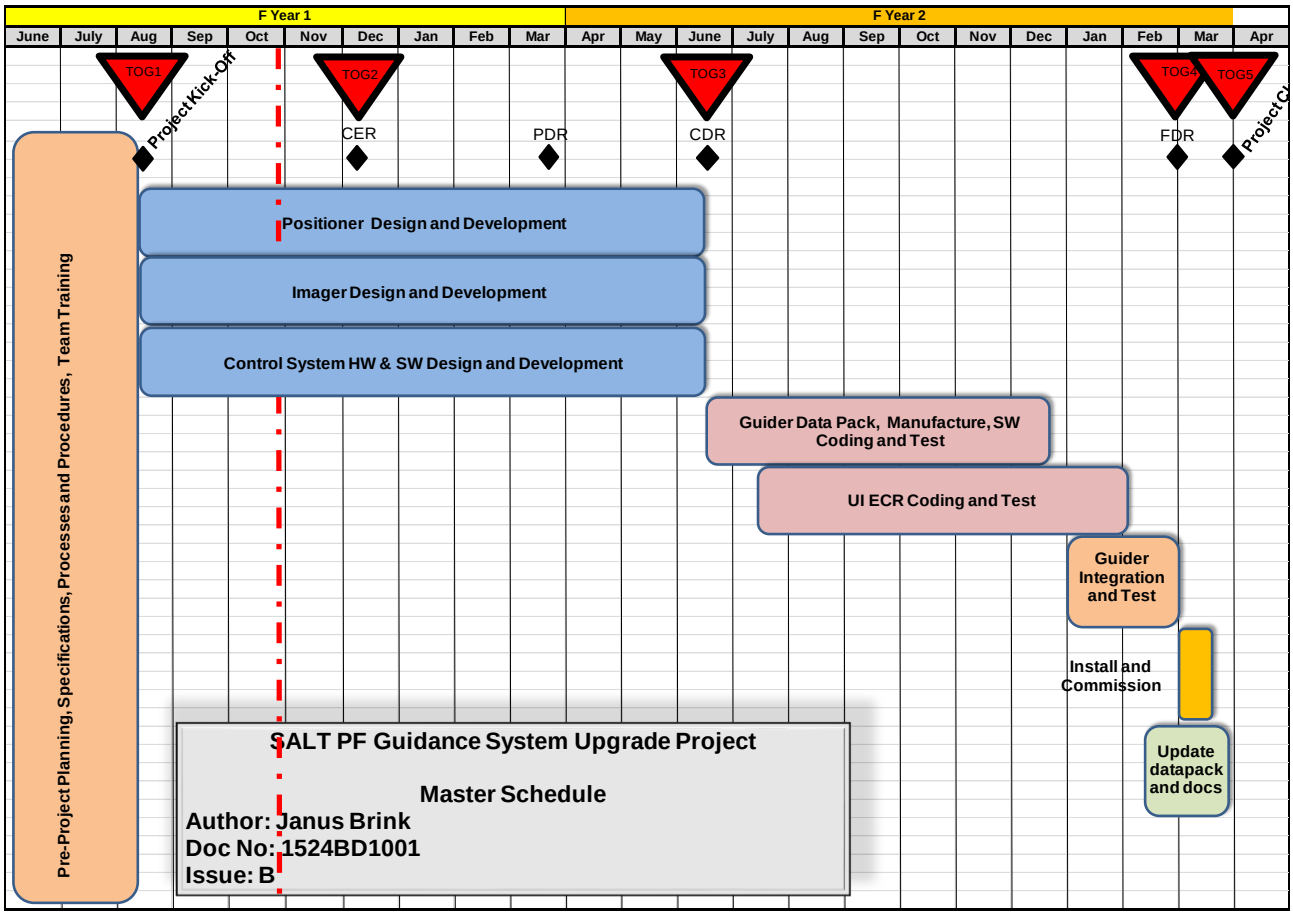
4 Project Status and Current Planning

Project planning and establishment of the project team has been completed. The project is currently in Stage 1 with concept design progressing on all subsystems. Following a successful preliminary concept design review of the Positioner and Control system, proof-of-concept hardware has been procured and the acceptance tests are being defined.

Item	% Complete	Date Complete	Responsible	Comments
Technical Specifications	**60%**	**October 2015**	**Janus, Ockert, Stephen**	**Docs being compiled. User requirements have been finalised.**
Design Principles	**70%**	**September 2015**	**Janus, Ockert, Stephen**	**Augmented established design principles. Optical design process TBD**
Project "Kick-Off"	**100%**	**August 2015**	**Janus**	**Completed**
Concept design – Positioner	**40%**	**December 2015**	**Janus, Ockert, Martin**	**In progress**
Concept Design – Imager	**30%**	**December 2015**	**Janus**	**In progress**
Concept Design – Control and Communication	**70%**	**November 2015**	**Stephen, Janus, Keith, Martin**	**In progress**
Preliminary concept review – Positioner and Control system hardware	**100%**	**September 2015**	**Project Team**	**Complete**
Concept Design - Software	**50%**	**January 2016**	**Janus, Stephen, Anthony, Deneys**	**In progress**

5 Project Schedule

The preliminary high-level master schedule is shown below, indicating the major project milestones and stages. The project spans until Q4 of the 2016/17 financial year.



6 Project Cost

The table below indicates costs to be covered by funding from the SALT board – specifically indicating capital items. All manpower is subsumed by the operations budget.

Financial Summary - Board funding					
Phase	**DPC**		**Manpower**		**Comments**
Project Stage - Positioner Development	R	272,220	R	-	
Project Stage - Imager Development	R	90,890	R	-	
Project Stage - Control & Communication	R	225,260	R	-	
Project Stage - Software	R	-	R	-	
Project Integration	R	-	R	-	
Contingency	R	158,837	R	-	Contingency from FMECA + 10%
Sub Total	R	747,207	R	-	
Grand Total	**R**			**747,207**	

The total of R747k is 147k over the original R600k approved budget for direct project costs. This excess is due to the following decisions and considerations:

1. R100k increase in Control and Communication hardware cost. The decision was taken to opt for a modular system with industrial grade embedded controller hardware rather than continuing with integrated PC-based motion control solutions. This reduces the risk of obsolescence and greatly improves overall reliability of the system.
2. R50k increase in direct-project-cost contingency to account for optical design risks now inherent in the project.

7 Summary

The project organization has put most of the required processes, specifications, design principles and inputs in place during the pre-project stage during the months of July and August 2015. In parallel the project team has been established and a formal Project “Kick-Off” Meeting was held in August 2015. Current effort is focused on concept design of the various components as well as establishing the optical design skills and processes.