Rubin Observatory

Vera C. Rubin Observatory
Systems Engineering

Integration Milestones

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SITCOMTN-006

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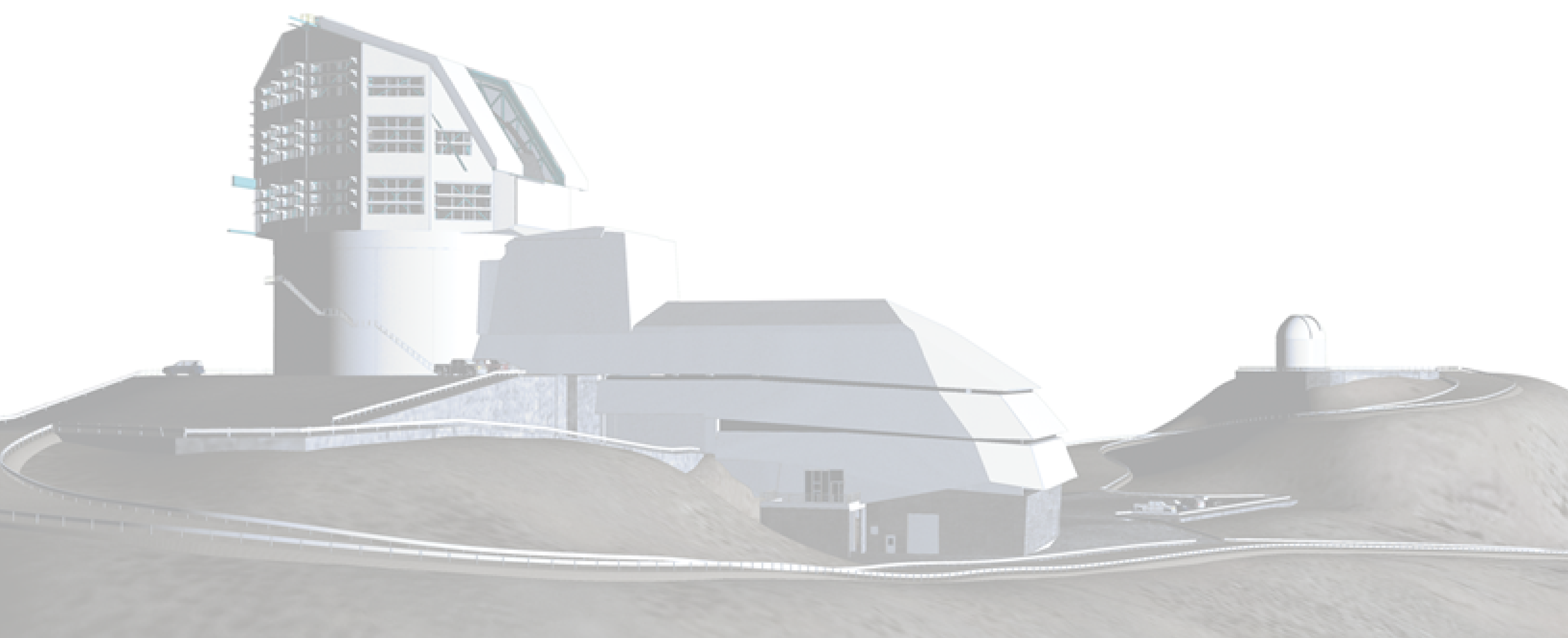

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Abstract

A proposal for ways to work on predominantly software subsystem commissioning, building on the Rubin AuxTel (née auxTel) experience

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Change Record

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1	YYYY-MM-DD	Unreleased.	Robert Lupton

Document source location: `https://github.com/lsst-sitcom/sitcomtn-006`

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1 Introduction

The Rubin construction project is composed of three main subsystems: DM, Camera, and T&S.[1] but in operations there is only one survey. The task of merging the projects is not easy, especially when some of the interfaces are underspecified, or turn out to need modification based on experience. This is primarily a problem for the software — the hardware interfaces, specified in mm and screw threads, are generally well defined.

Once we accept that the only way to complete the integration of the subsystems is to actually integrate them, while expecting that the interfaces and requirements will evolve, we recognise that our situation is analogous to the way that software development has moved from waterfall to agile development models.

This technote proposes that we introduce the concept of an Integration Milestone (IM) which defines a specified set of functionalities that are available to the Rubin project. This is slightly different from DM's current Operation Rehearsal (OR) concept which tests the state of DM systems at a certain time rather than guaranteeing continued cross-subsystem functionality. I envisage that an IM would be followed by an OR to test the deliverable, and to carry out an internal Operations Readiness Review (ORR) for the functionality delivered by the IM.

2 IM0: the Rubin Observatory Auxiliary Telescope

Add discussion of the work required to get the Rubin AuxTel working

2.1 Lessons Learned

Discuss *e.g.* OCS-CCS integration.

[1] And also EPO, but this is not relevant here.

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3 IM1

I propose using integrating comCam in La Serena into the complete Rubin system. The work in IM1 is intended to be 6-8 months. This means

- Using observatory codes to command comCam, with visibility from non-camera systems into all relevant camera parameters;
- Copying "house keeping" (*e.g.* influxDB) to NCSA;
- Transferring comCam data to NCSA and ingesting into Gen3;
- Automatic generation and validation of calibration products

In more detail:

- Run comCam reliably in Chile
  - without logging into CCS machines
  - integrating camera-side monitoring into Rubin operations
    * Query: Will the camera database utilities play well with influxdb?
  - writing files the way that we plan to in operations (i.e. directly from CCS)
    * *N.b.* I believe that this is not currently planned for comCam
- Take data using the OCS
  - writing telemetry to the EFD
  - using a logging system (which Frossie is designing for SITCOM); no use of *e.g.* eTraveller
  - using the script queue
    * In particular calibration sets: bias, dark, flat, PTC
  - using LOVE to see monitor operations
  - using OCPS (OCS driven Data Processing; DMTN-133) to process data in Chile
    * we may want to define an intermediate milestone, and defer processing data to IM2

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    * need to understand interaction with the diagnostic cluster
  - Ingesting promptly into Gen3 in La Serena
  - Using a nublado instance in La Serena to allow ad-hoc analysis
- Transfer data to NCSA and ingesting with a few-second latency and 100% reliability, or at least logging failures
  - This may be need to be delayed until IM2, but a latency much less than a day is necessary
  - Mirror or copy the EFD to NCSA
    * At a latency TBD
- Automatically process suitable data as it arrives
  - presumably using gen3
  - N.b. will require us to establish conventions on “suitable data”
- Run automated calibration scripts
  - For IM1 it may be simpler to run these in Chile, but ideally NCSA should also be possible
  - including QA
- Do something with the results of the QA
- Use the RSP to look at data
  - including EFD access
  - and a decently-high up time and performance.

Quite a lot of this doesn’t exist, and may have to be moved out to a later IM depending on resource availability. I suspect there’ll be push-back on some of this because doing things this way isn’t the way that it was planned (or really not planned, but written down in silos). In some cases this will be reasonable, for example we may decide that some fraction of CCS configuration is indeed better carried out by logging into CCS nodes.

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3.1 Lessons Learned

4 IM2: comCam II (or comCam on Cerro Pachón?)

4.1 Lessons Learned

A References

B Acronyms

Acronym	Description
AURA	Association of Universities for Research in Astronomy
CCS	Camera Control System
DM	Data Management
DMS	Data Management Subsystem
DMTN	DM Technical Note
DOE	Department of Energy
EFD	Engineering and Facility Database
EPO	Education and Public Outreach
IM	Integration Milestone
LDM	LSST Data Management (Document Handle)
LOVE	LSST Operations Visualization Environment
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
MREFC	Major Research Equipment and Facility Construction
NCSA	National Center for Supercomputing Applications
NOAO	National Optical Astronomy Observatories (USA)
NSF	National Science Foundation
OCS	Observatory Control System
OR	Operation Rehearsal
ORR	Operations Readiness Review

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QA	Quality Assurance
QC	Quality Control
RSP	Rubin Science Platform
SE	System Engineering
SLAC	SLAC National Accelerator Laboratory (formerly Stanford Linear Accelerator Center; SLAC is now no longer an acronym)
T&S	Telescope and Site
TBD	To Be Defined (Determined)
US	United States