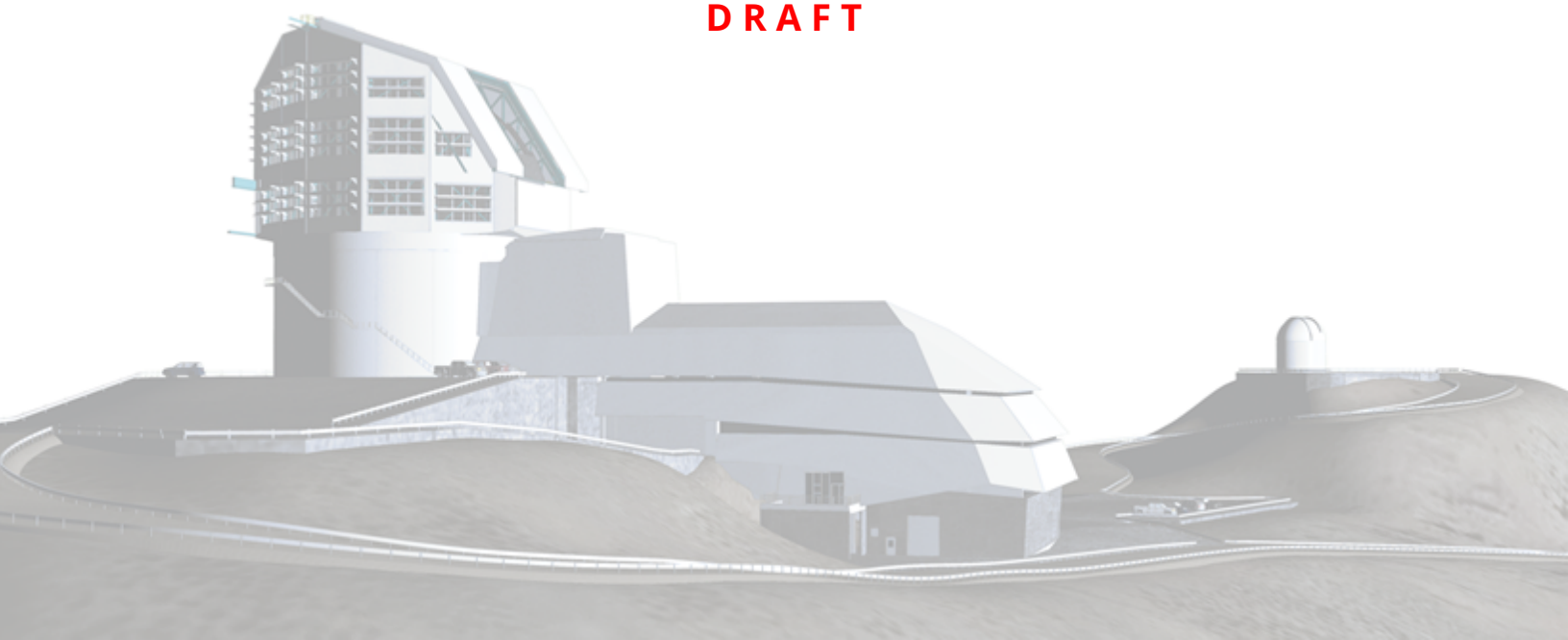

Vera C. Rubin Observatory
Data Management

LDM-503-11a: ComCam OPS Readiness Test Plan and Report

Robert Gruendl

DMTR-231

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DRAFT

Abstract

This is the test plan and report for **ComCam OPS Readiness** (LDM-503-11a), an LSST milestone pertaining to the Data Management Subsystem.

Change Record

Version	Date	Description	Owner name
	2020-08-19	First draft	Robert Gruendl
1.0	2020-09-04	Test Plan LVV-P76 approved. DM-16196.	Robert Gruendl
2.0	2020-11-11	Test Campaign LVV-P76 completed. DM-17125.	Robert Gruendl

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LDM-503-11a: ComCam OPS Readiness Test Plan and Report

1 Introduction

1.1 Objectives

This test plan verifies that DM software is ready to obtain and process ComCam observations. Since this test campaign is needed prior to on-sky data acquisition the tests are necessarily focused on the ability to process test-stand data. Therefore, the elements focus on the generic ability to process ComCam data.

1.2 System Overview

The system requires an operating ComCam at the Summit or on a test stand (either at the Base or Tucson). LDM-503-06 will have already shown that data acquisition (DAQ), archiver, header service, transfer mechanism, and ingest to the DBB are functional. Those systems are re-verified by this test as: 1) changes will almost certainly have occurred and 2) for this test to succeed the data must be properly formed and ingested for processing to succeed.

1.3 Applicable Documents

LDM-503: Data Management Test Plan
LDM-639: Data Management Acceptance Test Specification

1.4 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P76 Jira Test Plan and related Test Cycles (LVV-C159).

Section 1 provides an overview of the test campaign, the system under test (Data Manage-

ment), the applicable documentation, and explains how this document is organized. Section 2 provides additional information about the test plan, like for example the configuration used for this test or related documentation. Section 3 describes the necessary roles and lists the individuals assigned to them.

Section 4 provides a summary of the test results, including an overview in Table 2, an overall assessment statement and suggestions for possible improvements. Section 5 provides detailed results for each step in each test case.

The current status of test plan LVV-P76 in Jira is **Completed** .

1.5 References

[1] **[LDM-639]**, Guy, L., Wood-Vasey, W., Bellm, E., et al., 2022, *LSST Data Management Acceptance Test Specification*, LDM-639, URL `https://ldm-639.lsst.io/`, Vera C. Rubin Observatory Data Management Controlled Document

[2] **[LDM-503]**, O'Mullane, W., Swinbank, J., Juric, M., et al., 2022, *Data Management Test Plan*, LDM-503, URL `https://ldm-503.lsst.io/`, Vera C. Rubin Observatory Data Management Controlled Document

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

This test assumes a working DBB (Data BackBone) where raw ComCam data are available and ingested into a Butler repository (can be Gen2 or Gen3). Alternatively, the Base OODS (Observatory Operations Data System) could be used for these tests. In either case (DBB or OODS) compute hardware must be available that can see the DBB (USDF) or OODS (Base compute). A current DM production stack should be used but the tests do not require more than a single node (and could run on a single-core).

2.3 Entry Criteria

ComCam produces data with proper headers and can be transferred to the USDF.

2.4 Exit Criteria

Successful ingest and processing of ComCam data with pipeline tasks in the DM stack and resultant data products made available through an RSP instance.

2.5 Related Documentation

No additional documentation provided.

2.6 PMCS Activity

Primavera milestones related to the test campaign: LDM-503-11a: ComCam Ops Readiness

3 Personnel

The personnel involved in the test campaign is shown in the following table.

	T. Plan LVV-P76 owner:	**Robert Gruendl**	
	T. Cycle LVV-C159 owner:	**Robert Gruendl**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T1935	Robert Gruendl	Robert Gruendl	
LVV-T1934	Robert Gruendl	Robert Gruendl	

4 Test Campaign Overview

4.1 Summary

T. Plan LVV-P76:	**LDM-503-11a: ComCam OPS Readiness**			Completed
T. Cycle LVV-C159:	**LDM-503-11a: ComCam OPS Readiness**			Done
Test Cases	**Ver.**	**Status**	**Comment**	**Issues**
LVV-T1935	1	Pass	Test script was executed by verifying that processing during OPS Rehearsal 2 generated the expected calibrations and ingested same into the calibration repository in the shared file area (currently /project/shared/comCam/CALIB).	
LVV-T1934	1	Pass	Data transfer from ComCam (temporarily installed in the Base Data Center) has been routinely performed since July 2020. On the day this test was executed (2020-10-28) the Data BackBone endpoint at NCSA was checked for recently transferred data and then the shared repository was checked to make sure that the data were ingested and made generally available.	

Table 2: Test Campaign Summary

4.2 Overall Assessment

LVV-P76 was executed on 2020-10-28. During that execution it was demonstrated that ComCam data taken in the Base Data Center is successfully being transferred, archived and ingested (made available for use to DM staff) at NCSA. Furthermore it was verified that during the OPS Rehearsal #2 that bias and flat frames were routinely processed and used to form calibration products (demonstrating DM is capable of processing ComCam data).

4.3 Recommended Improvements

Execution of the current plan occurred using a Gen2 Butler implementation. It is recommended that these tests should be re-verified once ComCam is installed at the summit facility and the DM stack is using the Gen3 Butler implementation for processing data.

5 Detailed Test Results

5.1 Test Cycle LVV-C159

Open test cycle *LDM-503-11a: ComCam OPS Readiness* in Jira.

Test Cycle name: LDM-503-11a: ComCam OPS Readiness
Status: Done

Test that ComCam data can be received in the DBB, be made available and processed with results also made available to DM staff.

5.1.1 Software Version/Baseline

lsst_distrib w_2020_30

5.1.2 Configuration

ComCam operating at Base/Summit in a test stand capable of delivering image to NCSA. Data Backbone endpoint and OODS (Observatory Operations Data Service) ready to receive and ingest data.

5.1.3 Test Cases in LVV-C159 Test Cycle

5.1.3.1 LVV-T1935 - Demonstrate ComCam Data Processing Capability

Version **1**. Open *LVV-T1935* test case in Jira.

To process raw ComCam data and demonstrate that the results are available either in the shared DM development environment/repository or in the RSP.

Preconditions:
ComCam data acquisition and ingest are nominal. (LVV-T1934)

Execution status: **Pass**

Final comment:
Test script was executed by verifying that processing during OPS Rehearsal 2 generated the expected calibrations and ingested same into the calibration repository in the shared file area (currently /project/shared/comCam/CALIB).

Detailed steps results:

Step	Step Details
1	Description Obtain BIAS and FLAT sequences (minimum of 3 exposures each) Test Data Acquired from ComCam Archiver. Expected Result Data acquired, ingested, and available in shared work space. Actual Result During OPS rehearsal #2 (see DMTN-159) bias and flat sequences were acquired. Using the first night as an example: cd /project/shared/comCam sqlite3 _parent/registry.sqlite3 select expId,dayObs,imageType,raftName,detectorName from raw where dayObs='2020-07-27'; Shows sufficient BIAS and FLAT data have been properly ingested to the shared work-space. Status: **Pass**
2	Description Process BIAS frames Test Data From Step 1 Example Code

```
# setup a current LSST stack, currently:
/software/lsstsw/stack3/loadLSST.bash
setup -v lsst_distrib

setenv REPODIR=/project/shared/comCam
setenv VER_DIR={verification_dir}

constructBias.py $REPODIR --rerun $VER_DIR \
   --id expId=2020070800001^2020070800002^2020070800003 --batch-type none -c isr.doCrosstalk=False -j 9

ingestCalibs.py $REPODIR $REPODIR/rerun/$VER_DIR/bias/*/*.fits --validity 9999 --mode=link --calib $REPODIR/CALIB
```

Expected Result

Successful execution of BIAS reduction software (currently

```
constructBias.py and ingestion)
```

Actual Result

The processing notes that accompany DMTN-159 (are available in the github repo OPS_Rehearsal_2). There we find that constructBias.py and ingestCalibs.py were executed and find in the calibration repo the associated ingested bias entries:

```
cd /project/shared/comCam
sqlite3 CALIB/calibRegistry.sqlite3
select * from bias where calibDate='2020-07-27';
1|NONE|R22|S00|0|2020-07-27|1993-03-12|2020-07-28
2|NONE|R22|S01|1|2020-07-27|1993-03-12|2020-07-28
3|NONE|R22|S02|2|2020-07-27|1993-03-12|2020-07-28
4|NONE|R22|S10|3|2020-07-27|1993-03-12|2020-07-28
5|NONE|R22|S11|4|2020-07-27|1993-03-12|2020-07-28
6|NONE|R22|S12|5|2020-07-27|1993-03-12|2020-07-28
7|NONE|R22|S20|6|2020-07-27|1993-03-12|2020-07-28
8|NONE|R22|S21|7|2020-07-27|1993-03-12|2020-07-28
9|NONE|R22|S22|8|2020-07-27|1993-03-12|2020-07-28
```

Status: **Pass**

3 Description

Process FLAT frames

Test Data

From Step 1 (and step 2)

Example Code

```
# setup a current LSST stack, currently:
/software/lsstsw/stack3/loadLSST.bash
setup -v lsst_distrib

setenv REPODIR=/project/shared/comCam
setenv VER_DIR={verification_dir}

constructFlat.py $REPODIR --rerun $VER_DIR \
   --id expId=2020070100152..2020070100154 filter=r --batch-type none -j 9 -c isr.doCrosstalk=False

ingestCalibs.py $REPODIR $REPODIR/rerun/$VER_DIR/flat/*/*.fits \
    --validity 9999 --mode=link --calib $REPODIR/CALIB
```

Expected Result

Successful execution of FLAT reduction software (currently constructFlat.py and ingestion)

Actual Result

Similar to step 2:

```
select * from flat where calibDate='2020-07-27';
1|r|R22|S00|0|2020-07-27|1993-03-12|2020-07-28
2|r|R22|S01|1|2020-07-27|1993-03-12|2020-07-28
3|r|R22|S02|2|2020-07-27|1993-03-12|2020-07-28
4|r|R22|S10|3|2020-07-27|1993-03-12|2020-07-28
5|r|R22|S11|4|2020-07-27|1993-03-12|2020-07-28
6|r|R22|S12|5|2020-07-27|1993-03-12|2020-07-28
7|r|R22|S20|6|2020-07-27|1993-03-12|2020-07-28
8|r|R22|S21|7|2020-07-27|1993-03-12|2020-07-28
9|r|R22|S22|8|2020-07-27|1993-03-12|2020-07-28
```

Status: **Pass**

5.1.3.2 LVV-T1934 - ComCam Data Transfer and Ingestion

Version **1**. Open *LVV-T1934* test case in Jira.

Verify that ComCam Archiver data taken are transferred to NCSA Data BackBone endpoint and Ingested

Preconditions:
Operating ComCam and Base or Summit (test-stand or mounted on TMA)

Execution status: **Pass**

Final comment:
Data transfer from ComCam (temporarily installed in the Base Data Center) has been routinely performed since July 2020. On the day this test was executed (2020-10-28) the Data BackBone endpoint at NCSA was checked for recently transferred data and then the shared repository was checked to make sure that the data were ingested and made generally available.

Detailed steps results:

Step	Step Details
1	Description Trigger Exposure through OCS+Archiver Test Data generated by ComCam as part of test Example Code Expected Result Ingested ComCam exposure (9 files) at NCSA in shared Butler Repo (raw). Actual Result Data are being routinely generate with ComCam installed at the Base Data Center. I have verified that new data were generated today (2020-10-28) and transferred to NCSA and the DBB endpoint for raw data exists and has data (i.e. files transfer has been placing new data in: /lsstdata/offline/teststand/comcam/Archiver/storage/2020-10-28) Status: **Pass**
2	Description Check for presence of ingested raw data at NCSA Test Data Data produced in Step 1 Example Code

```
# note: currently assumes butler Gen2 (from NCSA machine)
cd /project/shared/comCam
sqlite3 _parent/registry.sqlite3
select expId,dayObs,raftName,detectorName from raw where expId={expo generated in step 1};
```

Expected Result

query of repo registry finds appropriate data entries showing a single raft and 9 detectors

Actual Result

Following the example above the most recent raw exposure to have arrived at NCSA had expId 2020102800060.
The following was generated when using that expId:

```
select expId,dayObs,raftName,detectorName from raw where expId=2020102800060;
2020102800060|2020-10-28|R22|S00
2020102800060|2020-10-28|R22|S01
2020102800060|2020-10-28|R22|S02
2020102800060|2020-10-28|R22|S10
2020102800060|2020-10-28|R22|S11
2020102800060|2020-10-28|R22|S12
2020102800060|2020-10-28|R22|S20
2020102800060|2020-10-28|R22|S21
2020102800060|2020-10-28|R22|S22
```

Confirming successful ingestion into the shared Gen2 repo at NCSA.

Status: **Pass**

A Acronyms used in this document

Acronym	Description
ComCam	The commissioning camera is a single-raft, 9-CCD camera that will be installed in LSST during commissioning, before the final camera is ready.
DAQ	Data Acquisition System
DBB	Data Backbone
DM	Data Management
DMS	Data Management Subsystem
DMS-REQ	Data Management System Requirements prefix
DMTN	DM Technical Note
DMTR	DM Test Report
LDM	LSST Data Management (Document Handle)
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LVV	LSST Verification and Validation
NCSA	National Center for Supercomputing Applications
OCS	Observatory Control System
OODS	Observatory Operations Data Service
OPS	Operations
PMCS	Project Management Controls System
RSP	Rubin Science Platform
TMA	Telescope Mount Assembly
USDF	United States Data Facility
VE	vendor estimate

B Traceability

Test Case	VE Key	VE Summary
LVV-T1934	LVV-8	DMS-REQ-0018-V-01: Raw Science Image Data Acquisition
	LVV-11	DMS-REQ-0024-V-01: Raw Image Assembly
	LVV-177	DMS-REQ-0346-V-01: Data Availability
	LVV-130	DMS-REQ-0299-V-01: Data Product Ingest
LVV-T1935	LVV-130	DMS-REQ-0299-V-01: Data Product Ingest
	LVV-120	DMS-REQ-0289-V-01: Calibration Production Processing