



DM Science Verification

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U.S. DEPARTMENT OF
ENERGY

SLAC

CHARLES AND LISA SIMONYI FUND
••• FOR ARTS AND SCIENCES •••



DM System Verification status

Verification Status

<https://jira.lsstcorp.org/secure/Dashboard.jspa?selectPageId=13601>

Verification Issues / Verification Status

All Last Execution Passed Any Last Execution Failed Covered by Vendor Test Case Covered by Critical Event **DM** Sub-Component - Q Summary

Requirement ID Selector **LSE-61: DMS** Verification Method Assignee Priority Status Resolution Labels Coverage Expected Compliance

Requirement Priority +JQL ↻ ×

Verification Issues / Verification Details

Overview Requirement Details Verification Details Excel Export

C EC Key	Summary ↑	P	Method	Assignee	Labels	Status	% Tests Passed
● LVV-3	DMS-REQ-0002-V-01: Transient Alert Distribution	🔴	Demonstration	Leanne Guy	None	IN VERIFICATION	50
● LVV-19488	DMS-REQ-0003-V-01: Science Data Archive_1	🔴	Test	Leanne Guy	None	COVERED	0
● LVV-175	DMS-REQ-0004-V-01: Time to L1 public release	🔴	Test	Melissa Graham	LCR-1883 LCR-1933	COVERED	0
● LVV-9740	DMS-REQ-0004-V-02: Latency of reporting optical transients	🔴	Undefined	Leanne Guy	LCR-1883 LCR-1933	COVERED	0
● LVV-9803	DMS-REQ-0004-V-03: Time to availability of Solar System Object orbits	🔴	Undefined	Leanne Guy	LCR-1883 LCR-1933	COVERED	0
● LVV-5	DMS-REQ-0008-V-01: Pipeline Availability	🔴	Analysis	Leanne Guy	None	COVERED	0
● LVV-6	DMS-REQ-0009-V-01: Simulated Data	🔴	Demonstration	Jim Bosch	None	VERIFIED	100
● LVV-7	DMS-REQ-0010-V-01: Difference Exposures	🔴	Demonstration	Eric Bellm	None	IN VERIFICATION	66.667
● LVV-8	DMS-REQ-0018-V-01: Raw Science Image Data Acquisition	🔴	Test	Leanne Guy	LDM-503-10	IN VERIFICATION	71.429
● LVV-9	DMS-REQ-0020-V-01: Wavefront Sensor Data Acquisition	🔴	Test	Gregory Dubois-Felsmann	None	IN VERIFICATION	80
● LVV-10	DMS-REQ-0022-V-01: Crosstalk Corrected Science Image Data Acquisition	🔴	Test	Gregory Dubois-Felsmann	LCR-1923	DESCOPE	0
● LVV-11	DMS-REQ-0024-V-01: Raw Image Assembly	🔴	Demonstration	Gregory Dubois-Felsmann	None	IN VERIFICATION	71.429
● LVV-12	DMS-REQ-0029-V-01: Generate Photometric Zeropoint for Visit Image	🔴	Demonstration	Jim Bosch	None	VERIFIED	100
● LVV-13	DMS-REQ-0030-V-01: Absolute accuracy of WCS	🔴	Test	Jim Bosch	None	MONITORING	100
● LVV-9741	DMS-REQ-0030-V-02: Minimum astrometric standards per CCD	🔴	Undefined	Jim Bosch	None	VERIFIED	100

Verification Issues / Coverage Statistics

16 NO COVERAGE 274 HAS COVERAGE 2 COVERED BY ANOTHER VE

0 HAS DEVIATION 2 DESCOPE 4 BLOCKED

297 filtered issues (15,042 hidden) Issue Count by Coverage

Verification Issues / Requirement's Expected Compliance

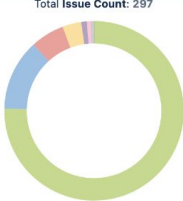
0 LOW RISK 0 SOME RISK 0 AT RISK

Issue Count by Expected Compliance

297 filtered issues (15,042 hidden)

Verification Issues / Verification Status

Total Issue Count: 297



Status: Covered In Verification Not Covered Verified SE Review Monitoring Descope

297 filtered issues (15,042 hidden) Issue Count by Status

DM verification status is tracked in Jira

And also exported and presented in the DM Verification Control Document

DM Requirements Prioritization

- **P1:** This must be done to enter commissioning (a) or operations (b); no waivers will be granted if not met.”
 - **1a:** Must be demonstrated to be working before the start of the commissioning period.
 - **1b:** Must be demonstrated to be working before the start of operations.
- **P2:** ”Should be done to enter Operations; but waiver likely to be granted if not met,” i.e., we could enter Operations without this fulfilled, for first 3 yrs.
- **P3:** ”Overall capability/efficiency/ease of use/etc., may be reduced but science will not critically suffer if not done.” Could enter operations without this requirement fulfilled, and have the operations team decide whether they want to pursue it.

Commissioning Key Dates

Current Schedule:

- ComCam + Pathfinder on cart assembly -- mid-August 2021
- ComCam + Pathfinder on TMA -- early January 2022 (+ ~3 months)
- ComCam on sky -- January 2023 (+ ~15 months)
- LSSTCam on sky -- July 2023 (+ ~21 months)
- SV survey start -- October 2023 (+~2 years)
- Current earliest completion date -- mid-January 2024 (+~ 2yrs 3 months)

Schedule contingency estimated ~6 months

Includes 2 months of sustained on-sky observations w/ LSSTCam for science verification and validation – the “SV survey”

DM P1a and P1b requirements need to be ready to support commissioning

See: [PCW 2021: Commissioning On-Sky Observing Strategy Session](#)

Major DM milestones for Commissioning

- LDM-GEN3: Gen3 parity demonstrated, 2021-10
- LDM-503-12: Ops rehearsal for commissioning #3 2021-11
- LDM-503-13: Ops rehearsal for data release processing #1 (ComCam), 2021-11
- LDM-503-14: Test Report: DM Readiness for Science Verification, 2021-11
- LDM-503-15a: Test report: Pipelines Release Fall 2021, 2021-11
- LDM-503-15: Ops rehearsal for data release processing #2 , 2021-12
- LDM-503-16: Ops rehearsal for data release processing #3, 2022-03
- LDM-503-RSPa: RSP Readiness for DPO.2 with Image Services, 2022-05
- LDM-503-RSPb: RSP Readiness for Science Verification, 2022-05
- LDM-503-17a: Test report: Final Pipelines Delivery, 2022-08
- LDM-503-17: Final operations rehearsal, 2022-09

Mapping Verification to Milestones

- One way to verify requirements is to map them to milestones. We have done this successfully for some milestones but not consistently
 - There are requirements can be verified already that have not been.
 - ...and requirements that are not captured by milestones.
- We should continue to do this where it is obvious -> verify as many requirements as early as possible but ...
- a concern is that it will encourage us to bundle too many things together and it will take a lot longer to complete a milestone.
 - E.g Science pipelines release milestones v Science pipeline Acceptance testing
- What level of verification is required to claim a milestone? Test plan and report, but we have not been very strict on the tests, e.g if it looks OK ...

Acceptance test Campaigns

- Alternative approach is keep the milestone slim and execute a series of detailed acceptance test campaigns between now and the end of construction.
- Pick up all requirements not verified as part of a milestone and provide clear points and test reports to show the verification status of DM. e.g
- Three dedicated acceptance test campaigns between now and the ORR:
 1. DM readiness for commissioning: (based on simulated and/or precursor data). As many P1a as possible (+ any others that are verifiable)
 2. ComCam data taking and processing: P1b needing commissioning data to verify
 3. LSSTCam data taking & Science Verification Surveys: All P1a/b, P2, P3 possible.

Operations Rehearsals

- Who takes these over now that Robert has left? Ops? USDF?
- Ops rehearsals are more about the actors and interactions than verifying the different components.
- What level of prior testing should be carried out on the constituent parts before executing an ops rehearsal?
- Avoid expanding ORs to cover new scope.
- We have more than just s/w and service requirements that could be verified as part of the operations rehearsals?

Networking & Base Facility

- [LDM-732: Network Verification Document](#) : Put together by Jeff Kantor in a form that could be shared with contractors and outside DM. Christian Silva has taken over.
 - Christian: *“We have not fulfilled one of the prerequisites and considering the lead times that we are getting from vendors, I don’t think it will be possible to fulfill it before Q2 2022. You will be able to transfer data to the USDF now, but we are replacing the core network of the summit and base, hence the network test has to be done after the new equipment is installed.”*
 - New time frame: ~June 2022
- Base Facility
 - If we are closing out the base facility. We should review the verification status of base facility requirements in the DMSR and ICDs

Middleware requirements.

New middleware PO model

- Jim Bosch has agreed to take on the role of MW product owner, primarily focusing on requirements definition and prioritization of work, along with his development efforts.
- Jim's focus is mostly pipelines. Gregory has agreed to back him up for what concerns the user-facing aspects of middleware, and to review prioritization of requirements.
- Jeff + Leanne will handle the verification effort including executing the upcoming Gen3 test plan

Middleware verification:

- Middleware requirements document : [LDM-556: Gen3 Middleware](#)
- Propose to treat middleware verification as per RSP and enter it into the Jira LVV project and conduct formal verification.
- Jim believes that many have been met already. We propose to update the upcoming Gen3 middleware test plan to capture those that can be easily verified immediately.

RSP Acceptance Test Campaign (2020-10)

- Gregory has identified 44 Portal requirements can be claimed now based on functionality already delivered that was not formally verified.
- These represent functionality that we know is working on one or more of the RSP instances in production (IDF, NCSA, ...)
- Given the large number of easily claimable Portal requirements, we propose to run a RSP-Portal Acceptance test campaign in November 2020.
- Gregory will work with Colin and Simon to do the same analysis for the API and Notebook Aspects and look to include those in the November test campaign

DM Science Validation

- Requirements verification is not enough to ensure we have a system, that can do the science it was designed to do.
- Science Validation will be run on the as-built system following requirements verification.
- Propose to carry this out entirely as part of commissioning on the integrated as-built system as part of the SV surveys