

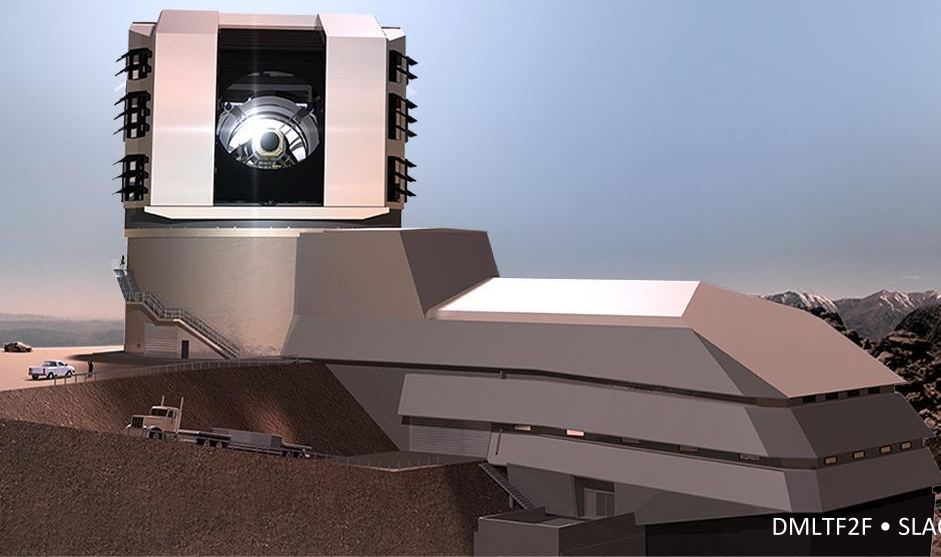


Verification Control Document

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- VCD Overview
- Scope
- Not in scope
- Related Information
- Auto-generation from Jira
- Conclusions
- Future Improvements

- The Verification Control Document (VCD) provides an overview of the requirements coverage, due to the tests executed in the frame of the Verification & Validation activities.
- The DM VCD is LDM-692 (<https://ldm-692.lsst.io/>) and it has been included in the latest JSR document pack, and will be provided also for future reviews.
- The VCD is used
 - Internally: to know where we are (extracted continuously)
 - Externally: to show completeness in a review (document issued)
- There are two main sections:
 - Coverage summary (section 2)
 - Synthetic information: for each requirement is given the minimum information required to show that it is covered or not (section 3)

Shows the Summary overview:

- Count of requirements coverage status
- Count of verification elements coverage status

- Count of test cases execution status

	Count of Requirements	Count of Verification Elements
Not related to any Test Case	260	536
Related to NOT executed Test Cases	352	384
Related to Failed Test Cases	2	2
Related to Passed Test Cases	79	80
Total	693	1002

Test Cases Results	
Not Executed	436
Conditional Pass	7
Fail	1
Pass	28
Total	472

Shows the synthetic (no description or details) information for each requirement:

- The Requirement ID
- The requirement specification
- The related Verification Elements
- The related Test cases (and test specification if available)
- The last execution date (if available) including document handlers (DMTR-XX) and Jira test plan id (LVV-PXX)
- The last execution result

Requirement	Verification Element	Test Case	Last Run	Test Status
DMS-REQ-0002 LSE-61	DMS-REQ-0002-V-01 LVV-3	LVV-T101 LDM-639		Not Executed
		LVV-T217 LDM-533	2018-07-04 DMTR-91 LVV-P1	Conditional Pass
DMS-REQ-0004 LSE-61	DMS-REQ-0004-V-01 LVV-4	LVV-T35 LDM-639		Not Executed
		DMS-REQ-0004-V-02 LVV-9740		
	DMS-REQ-0004-V-03 LVV-9803	LVV-T102 LDM-639		Not Executed
DMS-REQ-0008 LSE-61	DMS-REQ-0008-V-01 LVV-5	LVV-T171 LDM-639		Not Executed
		LVV-T287 LDM-538		Not Executed
DMS-REQ-0009 LSE-61	DMS-REQ-0009-V-01 LVV-6	LVV-T125 LDM-639		Not Executed
DMS-REQ-0010 LSE-61	DMS-REQ-0010-V-01 LVV-7	LVV-T18 LDM-533	2019-05-22 DMTR-53 LVV-P44	Passed
		LVV-T20 LDM-533	2019-05-22 DMTR-53 LVV-P44	Failed
		LVV-T36 LDM-639		Not Executed

- This document does not include the following information:
 - The working status
 - Partially executed Test Cases count as not executed
 - Execution Status
 - Completeness of ongoing test campaign
 - Descriptions and details
 - Links are provided to Jira Elements (VE, Test Cases, etc)
 - The requirements description is available in each corresponding verification element and in the linked specification
 - Reverse traceability matrix: test cases to requirements

- This document can be generated programmatically, since all information is available in Jira:
 - Requirements
 - Verification Elements
 - Test Cases
 - Last Run and Test Result
 - Relation between objects
 - ensure that the correct relations are in place, especially between test cases and Verification Elements

- Created in MagicDraw using a macro (System Engineering is in charge of this)
- Intrinsically related to a requirement
 - Description and other VE fields are left empty
- Synchronized in Jira using Syndeia MagicDraw commercial plugin
- The verification elements are issues in the LVV jira project

DM Team shall:

- Complete the Verification Element description
- Ensure that there is at least one Test Case defined per Verification Element

The relation between Verification Elements and Requirement is intrinsically provided:

- No need to worry about that.

- Do not exist in Jira as a defined object
- All verification elements include (read-only) all needed requirements information
- This permits programmatically to include requirements in the VCD without the need to get the information from MagicDraw.
- The Requirement management is done in MagicDraw and it is under CCB control (project or DM)
 - Not part of the Verification and Validation process
 - But changes to the requirements may be needed as feedback from V&V activities

- Plenty of details to take care: objective, priority, test script, etc.
 - How-to already covered in the previous Face2Face meeting

- Some reminders:
 - Traceability to Verification Elements: without this everything falls apart!
 - A test case (and the test script) shall not depend on a specific SW release nor dataset.
 - Re-use (in other test cases script) only test cases specifically written for that purpose.

- Note: a test case (and its result) may show up multiple times (in the VCD) if it is related with many Verification Elements.

Available only if the test case has been executed at least once.

Note: In case the test case is planned to be executed, but hasn't still, the result will be:

- Test result: Not Executed
- Last Run Date: None (to be changed)

DMS-REQ-0309 LSE-61	DMS-REQ-0309-V-01 LVV-140	LVV-T154 LDM-639	Not Executed
		LVV-T287 LDM-538	Not Executed
		LVV-T454 DMTR-121 LVV-P32	Not Executed

A verification element can be verified by others verification elements

- In this case that is shown in the VCD as **Verified in:**

DMS-REQ-0155 LSE-61	DMS-REQ-0155-V-01 LVV-60	Verified in:	DMS-REQ-0298-V-01(LVV-129) DMS-REQ-0300-V-01(LVV-131) DMS-REQ-0299-V-01(LVV-130)
DMS-REQ-0156 LSE-61	DMS-REQ-0156-V-01 LVV-61	Verified in:	DMS-REQ-0304-V-01(LVV-135) DMS-REQ-0303-V-01(LVV-134) DMS-REQ-0302-V-01(LVV-133)
DMS-REQ-0158 LSE-61	DMS-REQ-0158-V-01 LVV-62	Verified in:	DMS-REQ-0305-V-01(LVV-136) DMS-REQ-0307-V-01(LVV-138) DMS-REQ-0306-V-01(LVV-137)
		LVV-T11 LDM-534	2019-05-22 DMTR-51 LVV-P43
			Passed

- The document is generated using `docsteady` (B. Van Klaveren python tool)
 - The information is retrieved directly from the Jira database
 - Jira Rest API do not give the full result
 - The information is formatted into latex files using
 - `pandoc`
 - `jinja2` templates
 - The Subsystem jira custom field (associated with each Verification Elements):
 - is the key parameter used to identify all verification elements to include in the the document
- The execution can be done manually or as part of a Jenkins job
- Autogenerated tex files are
 - pushed to the LDM-692 GitHub repository
 - build and published in `ldm-692.lsst.io` (travis)
- Section 1 is manually maintained in GitHub (not auto-generated)

- We are able to document the requirements completeness in a programmatic way:
 - No extra activity required from the team
 - Just follow the DM development and documentation procedures

- But in order to do that we need:
 - All information properly related in Jira
 - This requires a bit more attention from everybody when writing test cases

- Benefit for every body:
 - Right coverage
 - Better number

- Include priority in the information provided for each Requirement and Verification Element

- Add more detail in section 2:
 - Summary information for each requirement document (LSE-61)

- Also (but out of scope):
 - Provide a real time web page that shows the the same information
 - This will permit to easily find the Verification Elements, Test Cases and test campaigns (cycles and plans) that need more work
 - Baseline the verification elements in a specific document

Questions?

- It is not clear to me how System Engineering will organize the change of status for each VE
- Probably some automartism will be put in place
- Or reviews.

