

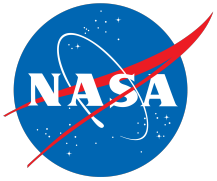


# PDS4 Operational Readiness Review

## System Testing

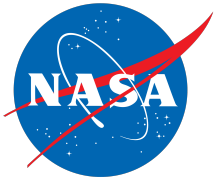
E. Law  
Engineering Node





# Approach

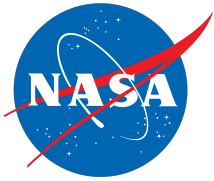
- Systematic integration and test performed for all incremental builds
  - Test cases designed to trace to requirements
  - Example products used as test data
- Regression test over time
- Support by EN and DN staff
- Posting of all test plan, procedures and results per build
- Issues logged in JIRA



# System Testing

- Completed testing of incremental builds
  - 1a, 1c, 1d, 2a, 2b, 2c, 3a, 3b
- Testing of infrastructure and End to End capabilities against requirements
  - Use example products based on IM
  - Preparation & Ingestion Tools, Catalog Migration, Registry, and Catalog Search
- Artifacts posted on EN build pages
  - Software, Release Description, Design Specs, Test Docs, Results and RFAs



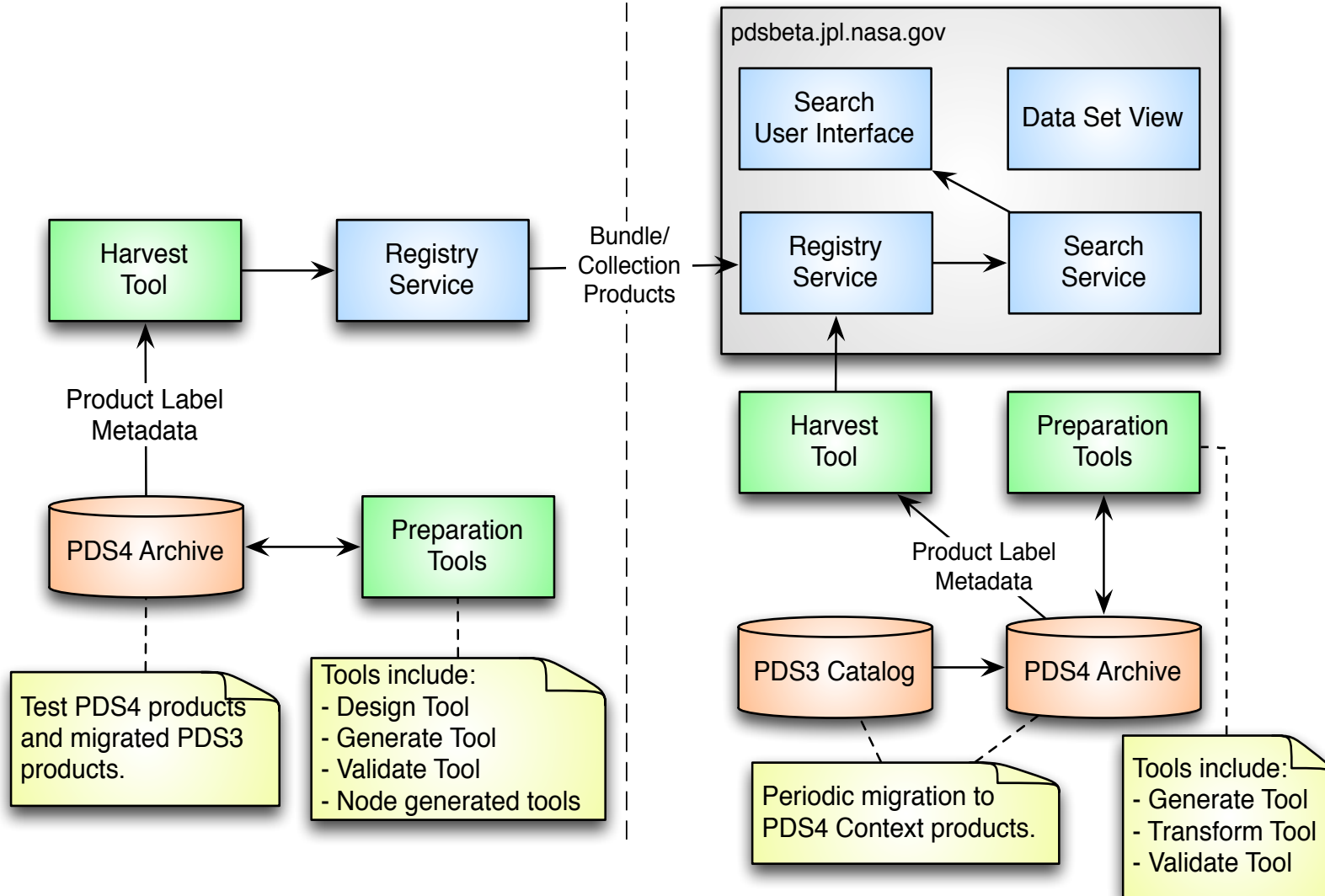


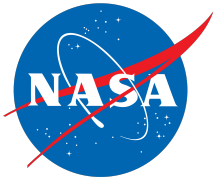
# Build 3b Test Environment



Discipline Nodes

Engineering Node

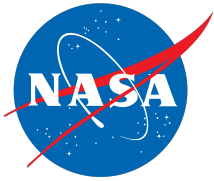




# Build 3b Software

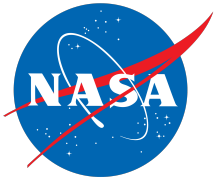
- **Registry Service**
- **Harvest Tool**
- **Validate Tool**
- **Search Service**
- **PDS Portal**
- Catalog Ingestion Tool
- Security Service
- Report Service

Components critical for  
LADEE/MAVEN



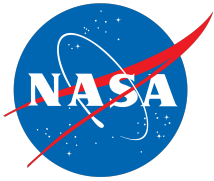
# Build 3b Testing for LADEE/MAVEN

- Verification using LADEE/MAVEN representative example product types
  - Design and Generate context products, bundles
  - Validate product labels
  - Harvest and register products, bundles, web resources
  - Search and access bundles and web resources



# Build 3b System Testing

- Performed by EN
- April-June 2013
- Test plan
  - <http://pds.nasa.gov/pds4/orr0913/build3bTestPlanEN.pdf>
- Test cases performed: 45
- Requirements traced/tested: 79

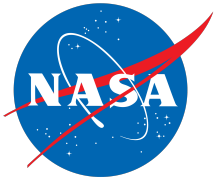


# Test Case Examples (1)

Test Case ID	AAFUNCTION.1
Description	Create a PDS4 Product Label using a design tool based on PDS's schema.
Requirements	L5.PRP.DE.*
Success Criteria	Design tool produces a syntactically valid PDS Product Label else indicates where the label is invalid.

Test Case ID	AAFUNCTION.2
Description	Validate PDS4 label
Requirements	L5.PRP.VA.1, L5.PRP.VA.2, L5.PRP.VA.5, L5.PRP.VA.6, L5.PRP.VA.7, L5.PRP.VA.9
Success Criteria	Validation tool validates a file or all eligible products in a directory tree, indicates the schemas utilized during the validation, and ensures that a product label is well formed XML and conforms to its schemas. Also validate for content as well as syntax.



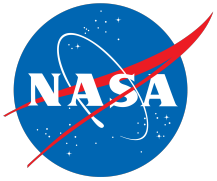


# Test Case Examples (2)

Test Case ID	AAFUNCTION.3
Description	Harvest PDS4 labels
Requirements	L5.HVT.1, L5.HVT.2, L5.HVT.4, L5.HVT.5, L5.HVT.6, L5.HVT.7, L5.HVT.8, L5.REG.1, L5.REG.8
Success Criteria	Harvest tool, based on criteria given in a user-edited configuration file, discovers all matching artifacts and for each submits metadata to the Registry service. Tools to view the registry show the metadata of the matching artifacts. If the registry is controlled, the security service verifies that the user of Harvest has proper permission.

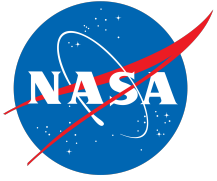
Test Case ID	AAFUNCTION.4
Description	Search for PDS4 data (*only high-level search at EN ready for build 3b)
Requirements	L5.SCH.1, L5.SCH.5, L5.SCH.6, L5.SCH.8, L5.SCH.10, L5.SCH.11, L5.SCH.12
Success Criteria	After configuration (e.g. regenerating search indices), Search returns the data harvested in the previous step, both high-level and product-level.





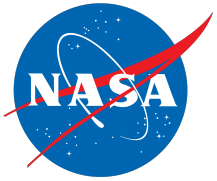
# Build 3b System Test Results

- Test report
  - <http://pds.nasa.gov/pds4/orr0913/build3bProceduresReportEN.pdf>
- Test cases performed: 45
- Test cases passed: 45
- Critical anomalies detected: 0
- Open suggested improvements : 6 (2 closed since)



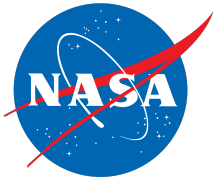
# Status

- Build 3b infrastructure is operational at EN
- Local registry and tools installed and tested at ATMOS and PPI



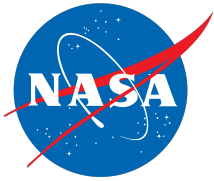
# Node Verification

- PHX data was used as representative to successfully verify PDS4 capabilities for LADEE by ATMOS
- MGS, PHX, ARTEMIS analogous products were used to successfully verify PDS4 capabilities for MAVEN by ATMOS and PPI
- Critical anomalies detected: 0



# Build 4a Testing

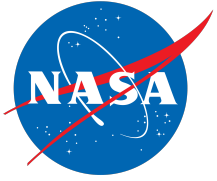
- Will add additional test cases for testing
  - Product Search
  - Distribution
- Will perform regression test



# Test Summary

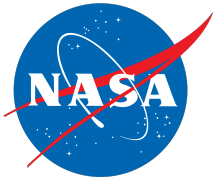
- Build 3b software infrastructure used operationally at EN in support of all PDS data
- Build 3b software is in place at ATMOS and PPI
- **Build 3b software is ready to support design, validate, harvest, registration and catalog level search for LADEE and MAVEN**
  - This meets our ToR requirements
- **Build 4a will be verified to support product search and distribution for LADEE and MAVEN**





Thank you

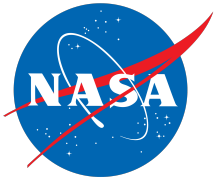
Questions?



# Backup

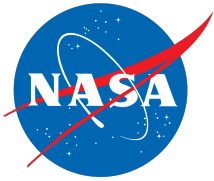






# System Test Traceability (1)

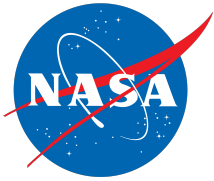
Count	System Component	Requirement #	Test case ID
1	General System	L5.GEN.1	GEN.1
2	General System	L5.GEN.2	GEN.1
3	General System	L5.GEN.3	REG.1, SCH.3
4	General System	L5.GEN.4	PRV.1
5	General System	L5.GEN.5	RPT.1
6	General System	L5.GEN.6	RPT.1
7	General System	L5.GEN.9	GEN.5
8	General System	L5.GEN.10	AATESTME.4
9	General System	L5.GEN.11	GEN.7
10	Harvest Tool	L5.HVT.1	AAFUNCTION.3, HVT.1, HVT.2
11	Harvest Tool	L5.HVT.2	AAFUNCTION.3, HVT.1
12	Harvest Tool	L5.HVT.3	HVT.2
13	Harvest Tool	L5.HVT.4	AAFUNCTION.3, HVT.1, HVT.2
14	Harvest Tool	L5.HVT.5	AAFUNCTION.3, HVT.1, HVT.2
15	Harvest Tool	L5.HVT.6	AAFUNCTION.3, HVT.1, HVT.2
16	Harvest Tool	L5.HVT.7	AAFUNCTION.3, HVT.1, HVT.2
17	Harvest Tool	L5.HVT.8	AAFUNCTION.3, HVT.1, HVT.2
18	Prep: Design Tool	L5.PRP.DE.1	AAFUNCTION.1
19	Prep: Design Tool	L5.PRP.DE.2	AAFUNCTION.1
20	Prep: Design Tool	L5.PRP.DE.3	AAFUNCTION.1
21	Prep: Design Tool	L5.PRP.DE.4	AAFUNCTION.1
22	Prep: Design Tool	L5.PRP.DE.5	AAFUNCTION.1
23	Prep: Design Tool	L5.PRP.DE.6	AAFUNCTION.1
24	Prep: Design Tool	L5.PRP.DE.7	AAFUNCTION.1
25	Prep: Validation Tool	L5.PRP.VA.1	AAFUNCTION.2, PRV.1



# System Test Traceability (2)

Count	System Component	Requirement #	Test case ID
26	Prep: Validation Tool	L5.PRP.VA.2	AAFUNCTION.2, PRV.1
27	Prep: Validation Tool	L5.PRP.VA.3	AAFUNCTION.2
28	Prep: Validation Tool	L5.PRP.VA.5	AAFUNCTION.2, PRV.1
29	Prep: Validation Tool	L5.PRP.VA.6	AAFUNCTION.2, PRV.1
30	Prep: Validation Tool	L5.PRP.VA.7	AAFUNCTION.2, PRV.6
31	Prep: Validation Tool	L5.PRP.VA.9	AAFUNCTION.2, PRV.1
32	Prep: Validation Tool	L5.PRP.VA.10	PRV.2
33	Registry Service	L5.REG.1	AAFUNCTION.3, REG.1, REG.9
34	Registry Service	L5.REG.2	AATESTME.7, REG.2
35	Registry Service	L5.REG.3	REG.3
36	Registry Service	L5.REG.4	AATESTME.1, REG.1
37	Registry Service	L5.REG.5	REG.1
38	Registry Service	L5.REG.6	AAFUNCTION.3, AATESTME.3, REG.4
39	Registry Service	L5.REG.7	REG.5
40	Registry Service	L5.REG.8	AAFUNCTION.3
41	Registry Service	L5.REG.9	AATESTME.6, REG.6
42	Registry Service	L5.REG.10	REG.6
43	Registry Service	L5.REG.11	REG.6
44	Registry Service	L5.REG.12	REG.6
45	Registry Service	L5.REG.13	AATESTME.6, AATESTME.8, REG.1, REG.4
46	Registry Service	L5.REG.14	AATESTME.1, AATESTME.8, REG.1, REG.4
47	Report Service	L5.RPT.1	RPT.1
48	Report Service	L5.RPT.2	RPT.1
49	Report Service	L5.RPT.3	RPT.1
50	Report Service	L5.RPT.4	RPT.1



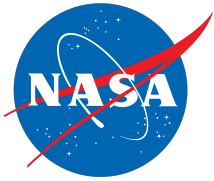


# System Test Traceability (3)

Count	System Component	Requirement #	Test case ID
51	Report Service	L5.RPT.5	RPT.2
52	Report Service	L5.RPT.6	RPT.1, RPT.2
53	Report Service	L5.RPT.7	RPT.3
54	Report Service	L5.RPT.8	RPT.4
55	Report Service	L5.RPT.9	RPT.4
56	Report Service	L5.RPT.10	RPT.4
57	Report Service	L5.RPT.11	RPT.5
58	Search Service	L5.SCH.1	AAFUNCTION.4, SCH.5
59	Search Service	L5.SCH.3	SCH.2
60	Search Service	L5.SCH.4	SCH.3
61	Search Service	L5.SCH.5	AAFUNCTION.4, SCH.4
62	Search Service	L5.SCH.6	AAFUNCTION.4, SCH.5
63	Search Service	L5.SCH.7	SCH.6
64	Search Service	L5.SCH.8	AAFUNCTION.4, SCH.6
65	Search Service	L5.SCH.9	AAFUNCTION.4, SCH.6
66	Search Service	L5.SCH.10	AAFUNCTION.4, SCH.7
67	Search Service	L5.SCH.11	AAFUNCTION.4, SCH.7
68	Search Service	L5.SCH.12	AAFUNCTION.4
69	Security Service	L5.SEC.1	AATESTME.4
70	Security Service	L5.SEC.2	SEC.4
71	Security Service	L5.SEC.3	AATESTME.4
72	Security Service	L5.SEC.4	SEC.1
73	Security Service	L5.SEC.5	SEC.3
74	Security Service	L5.SEC.6	SEC.1
75	Security Service	L5.SEC.7	SEC.2
76	Catalog Tool	L5.CAT.CMP	CTLG.1
77	Catalog Tool	L5.CAT.VAL	CTLG.2
78	Catalog Tool	L5.CAT.ING	CTLG.3
79	Prep: Generate Tool	L5.PRP.GEN	PRG.1

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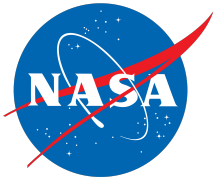


# Node Test Cases (1)

Test Case ID	NODESTEST.1
Description	Use a design tool to create PDS4 labels for products, and associated context (including bundle, collection, investigation archive webpage, investigations, resources) based on PDS's schema.
Requirements	L5.PRP.DE.1-7
Success Criteria	Design tool produces a syntactically valid PDS Product Label else indicates where the label is invalid.

Test Case ID	NODESTEST.2
Description	Validate Node-developed PDS4 product labels generated in NODESTEST.1 using the PDS4 Validate Tool.
Requirements	L5.PRP.VA.1-.3, L5.PRP.VA.5-9
Success Criteria	Validation tool validates a file or all eligible products in a directory tree, indicates the schemas utilized during the validation, and ensures that a product label is well formed XML and conforms to its schemas.

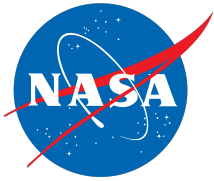




# Node Test Cases (2)

Test Case ID	NODESTEST.3
Description	Use Harvest Tool to register PDS4 product labels, bundles, and collections generated in NODESTEST.1. Context products will be registered by EN.
Requirements	L5.HVT.1-2, L5.HVT.4-8, L5.REG.1-4, L5.REG.6, L5.REG.8
Success Criteria	Harvest tool, based on criteria given in a user-edited configuration file, discovers all matching artifacts and for each submits metadata to the Registry service. Tools to view the registry show the metadata of the matching artifacts.

Test Case ID	NODESTEST.4
Description	Find registered products using PDS Home Page Data Search and download products from the Node.
Requirements	L5.SCH.1, L5.SCH.6-8, L5.SCH.10-11
Success Criteria	Search returns the data harvested in the previous step and the data can be downloaded.

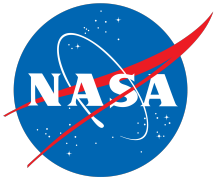


# Node Test Traceability



Count	System Component	Requirement #	Test case ID
1	Harvest Tool	L5.HVT.1	NODESTEST.3
2	Harvest Tool	L5.HVT.2	NODESTEST.3
3	Harvest Tool	L5.HVT.4	NODESTEST.3
4	Harvest Tool	L5.HVT.5	NODESTEST.3
5	Harvest Tool	L5.HVT.6	NODESTEST.3
6	Harvest Tool	L5.HVT.7	NODESTEST.3
7	Harvest Tool	L5.HVT.8	NODESTEST.3
8	Prep: Design Tool	L5.PRP.DE.1	NODESTEST.1
9	Prep: Design Tool	L5.PRP.DE.2	NODESTEST.1
10	Prep: Design Tool	L5.PRP.DE.3	NODESTEST.1
11	Prep: Design Tool	L5.PRP.DE.4	NODESTEST.1
12	Prep: Design Tool	L5.PRP.DE.5	NODESTEST.1
13	Prep: Design Tool	L5.PRP.DE.6	NODESTEST.1
14	Prep: Design Tool	L5.PRP.DE.7	NODESTEST.1
15	Prep: Validation Tool	L5.PRP.VA.1	NODESTEST.2
16	Prep: Validation Tool	L5.PRP.VA.2	NODESTEST.2
17	Prep: Validation Tool	L5.PRP.VA.3	NODESTEST.2
18	Prep: Validation Tool	L5.PRP.VA.5	NODESTEST.2
19	Prep: Validation Tool	L5.PRP.VA.6	NODESTEST.2
20	Prep: Validation Tool	L5.PRP.VA.7	NODESTEST.2
21	Prep: Validation Tool	L5.PRP.VA.8	NODESTEST.2
22	Prep: Validation Tool	L5.PRP.VA.9	NODESTEST.2
23	Registry Service	L5.REG.1	NODESTEST.3
24	Registry Service	L5.REG.2	NODESTEST.3
25	Registry Service	L5.REG.3	NODESTEST.3
26	Registry Service	L5.REG.4	NODESTEST.3
27	Registry Service	L5.REG.6	NODESTEST.3
28	Registry Service	L5.REG.8	NODESTEST.3
29	Search Service	L5.SCH.1	NODESTEST.4
30	Search Service	L5.SCH.6	NODESTEST.4
31	Search Service	L5.SCH.7	NODESTEST.4
32	Search Service	L5.SCH.8	NODESTEST.4
33	Search Service	L5.SCH.10	NODESTEST.4
34	Search Service	L5.SCH.11	NODESTEST.4

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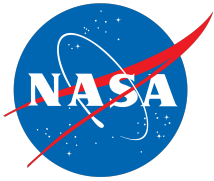


# LADEE/MAVEN Traceability (1)

Deliverable	PDS Requirements	PDS Components	Review & Test Cases
LADEE LDEX & UVS products - tab delimited ASCII tables	Req 1.4 Archiving Standards	Information Model, Schemas, Standards Reference	Standards Review, Build 3b NODEFUNCTION.1**
LADEE NMS products - comma delimited ASCII tables	Req 1.4 Archiving Standards	Information Model, Schemas, Standards Reference	Standards Review, Build 3b NODEFUNCTION.1
MAVEN IUVS products - FITS files	Req 1.4 Archiving Standards	Information Model, Schemas, Standards Reference	Standards Review, Build 3b NODEFUNCTION.1
MAVEN NGIMS, MAG, ACC products - ASCII tables	Req 1.4 Archiving Standards	Information Model, Schemas, Standards Reference	Standards Review, Build 3b NODEFUNCTION.1
MAVEN STATIC,SEP,SWEA,SWIA, LPW,LPW-EUV products - PDS4 compliant CDF files	Req 1.4 Archiving Standards	Information Model, Schemas, Standards Reference	Standards Review, Build 3b NODEFUNCTION.1

\*\* NODEFUNCTION.n – Test Case IDs





# LADEE/MAVEN Traceability (2)

Deliverable	PDS Requirements	PDS Components	Review & Test Cases
Templates for data and documents	Req 1.2.1 PDS will provide examples and suggestions	Samples, Data Provider Handbook, Archive Preparation Guide	Standards Review, Build 3b NODEFUNCTION.1**
Assistance & review of SIS and sample data files	Req 2.4 Peer Review	Peer Review Guideline	Follow the PDS review process
Validation tools for PDS4 standards compliance	Req 1.5.2 PDS will provide tools to validate products against PDS standards	Validate Tools	Build 3b, NODEFUNCTION.2
Final products review and acceptance	Req 2.4 Peer Review, Req 2.5.2 PDS will implement procedures for accepting archival data	Peer Review Guideline, Archive Preparation Guide	Follow the PDS review process
Data distribution to science community	Req 3.1 Search, Req 3.2 Retrieval	Search service (discovery and download)	Build 3b, NODEFUNCTION.4

\*\* NODEFUNCTION.n – Test Case IDs

