Small Explorers Program Aeronomy of Ice in the Mesosphere (AIM)	
AIM Science Data System End-to-End Test Plan	
AIM-SDS-EETP-V0	January 17, 2006

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1 Scope

1.1 Identification

This End-to-End Test Plan (EETP) describes the End-to-End Test (EET) activities and the environment used by those activities for the AIM Science Data System (SDS). These activities complement the test activities between the AIM Spacecraft, the Mission Operations Center (MOC) and the instrument Payload Operations Centers (POCs) to demonstrate that the SDS supports the interfaces and functions required to provide science data to the community.

The End-to-End testing of the AIM Science Data System will occur in multiple stages, starting with an EET of just the SDS in April, 2006 and continuing with a series of tests as part of the AIM Ground Data System End-to-End Tests. This document focuses on the first SDS EET which will primarily test the data management and communications capability of and between the various facilities of the SDS.

1.2 System Overview

The AIM Data System consists of two primary elements, the Mission Operations Data System (MODS) and the Science Data System (SDS) as shown in **.** The MODS elements, consisting of the Ground Station, Mission Operations Center (MOC), and instrument Payload Operation Centers (POCs) are responsible for the command, control and monitoring of the AIM spacecraft and instruments. The SDS elements, which include the Project Data Center (PDC), the instrument Data Processing Centers (DPCs) and the portion of the POCs engaged in telemetry storage and distribution, are responsible for the transformation of raw instrument data into the science data products described in the AIM Data Management Plan.

1.3 Document Overview

This document describes the End-to-End Test Plan for the AIM SDS.

1.4 Relationship to Other Plans

This EETP is related to the both the AIM Data Management Plan and the AIM SDS ICD listed below.

2 Referenced Documents

1. AIM Data Management Plan, G&A Technical Software, Inc., AIM-DMP-03-1.V2, Apr 2005.

2. AIM Science Data System Interface Control Document, G&A Technical Software, Inc., AIM-SDS-ICD-03-1.V1, Oct 2004.

3 Software Test Environment

3.1 Software Items

The software items needed to perform the AIM SDS End-to-End Testing are listed in Table 1. The data and software used are unclassified and have no security issues.

Software Item	Purpose
MOC	
CDE Processing Software	Process CDE instrument data and generate science data products
CIPS Processing Software	Process CIPS instrument data and generate science data products
SOFIE Processing Software	Process SOFIE instrument data and generate science data products
CVO Processing Software	Process Common Volume Observation data and generate science data products
PDC UIS	User Interface to the AIM PDC
PDC SIS	Provide automated communication to the CDE/CIPS/SOFIE data processing centers.
PDC DSS	Ingest and manage information in the AIM data catalog
Test files	Exercise interfaces with correctly formatted data

Table 1: Software Items Required to Support End-to-End Testing

The test files needed to support this EET consist of all AIM Science Data Products identified in the AIM Data Management Plan (Reference 1).

3.2 Hardware Items

The hardware items needed to perform the End-to-End test and their purpose are listed in Table 2.

Hardware Item	Purpose
Computers (PDC, CDE, CIPS, SOFIE)	Host the software components of the AIM SDS
Web server hardware	Host web sites
Data storage	Provide storage for source code, executables, and test data for the EET

3.3 Test Class Descriptions

- **Expected value testing –** a range of values typical of the input domain will be used to test nominal performance.

- **Boundary value testing –** values from input domain boundaries will be used to test extreme input and support error detection, recovery and reporting.

- **Stress testing –** maximum capacity of the input domain will be used to test interfaces, error handling, system response and execution times.

- **Erroneous input –** values outside the input domain (erroneous values) will be used to test error handling, error recovery, and reporting of errors.

- **Data validation testing –** output data will be validates by comparison with a baseline and by acceptable results in downstream applications or demonstration.

- **Desk check testing –** output will be manually inspected and analyzed.

3.4 Test Level Descriptions

- **System level –** evaluate conformance to system performance requirements.

- **Interface level –** evaluate compliance with internal and external interface requirements.

- **Component level –** evaluate conformance to component requirements and validate output.

4 SDS Internal Interface 1 (DPC to PDC)

Communication from the instrument DPCs to the AIM PDC is handled via either forms on the PDC website or automated XML formatter e-mail messages.

4.1 Data Processing Center URL (DPC_URL)

The purpose of this test is to verify the DPC_URL handling capability of the Science Data System, particularly the AIM PDC. The DPC_URL is a message providing the web location and e-mail address of a DPC to the PDC. The ability to add, delete, and modify a DPC_URL via web form and automated e-mail will be tested.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	*Automated E-mail*
Add	DPC_URL_1	DPC_URL_4
Modify	DPC_URL_2	DPC_URL_5
Delete	DPC_URL_3	

4.1.1 Test DPC_URL_1 (Web Form Add)

4.1.1.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *UPDATE DPC URL* link

4. Select the appropriate DPC name (CDE, CIPS, SOFIE)

5. Enter the e-mail address that will be used by the DPC for automated messages

6. Enter the URL for the DPC website

4.1.1.2 Acceptance Criteria

1. PDC operator / manager performs a database query, manually inspects the results to verify the e-mail address and URL are correctly recorded.

4.1.2 Test DPC_URL_2 (Web Form Modify)

4.1.2.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *UPDATE DPC URL* link

4. Select the appropriate DPC name (CDE, CIPS, SOFIE)

5. Enter the e-mail address that will be used by the DPC for automated messages

6. Enter the URL for the DPC website

4.1.2.2 Acceptance Criteria

1. PDC operator / manager performs a database query, manually inspects the results to verify the e-mail address and URL are correctly recorded.

4.1.3 Test DPC_URL_3 (Web Form Delete)

4.1.3.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *UPDATE DPC URL* link

4. Select the appropriate DPC name (CDE, CIPS, SOFIE)

5. Enter the e-mail address that will be used by the DPC for automated messages

6. Enter the URL for the DPC website

4.1.3.2 Acceptance Criteria

1. PDC operator / manager performs a database query, manually inspects the results to verify the e-mail address and URL are correctly recorded.

4.1.4 Test DPC_URL_4 (Automated E-mail Add)

4.1.4.1 Test Procedure

1. Run the script dpc_url.pl with arguments as follows:

    ./dpc_url <DPC Name> <Email Address> <DPC URL>

4.1.4.2 Acceptance Criteria

1. PDC operator / manager performs a database query, manually inspects the results to verify the e-mail address and URL are correctly recorded.

4.1.5 Test DPC_URL_5 (Automated E-mail Modify)

4.1.5.1 Test Procedure

1. Run the script dpc_url.pl with arguments as follows:

    ./dpc_url <DPC Name> <Email Address> <DPC URL>

4.1.5.2 Acceptance Criteria

1. PDC operator / manager performs a database query, manually inspects the results to verify the e-mail address and URL are correctly recorded.

4.2 Data Product Specification (DPS)

The purpose of this test is to verify the DPS handling capability of the Science Data System, particularly the AIM PDC. The DPS is a message containing the description of a science data product as an attachment (NetCDF cdl definition file). The ability to add, delete, and modify a DPS via web form will be tested.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	Automated E-mail
Add	DPS_1	DPS_4
Modify	DPS_2	

	Web Form	*Automated E-mail*
Delete	DPS_3	

4.2.1 Test DPS_1 (web form add)

4.2.1.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *PRODUCT SPECIFICATIONS* link

4. Click *Add Product Specification.*

5. Click *Browse* and select the NetCDFcdl definition file to be uploaded.

6. Fill in the required fields in the form.

7. Press the *Upload* button.

4.2.1.2 Acceptance Criteria

1. Click on the *PRODUCT SPECIFICATIONS* link

2. Click *Update/Delete Existing Product Specification.*

3. Select product specification file that was just uploaded

4. Verify that all the fields appear correctly.

4.2.2 Test DPS_2 (web form modify)

4.2.2.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *PRODUCT SPECIFICATIONS* link

4. Click *Update/Delete Existing Product Specification.*

5. Select product specification file added in test DPS_1

6. Modify each field in the form

7. Press the *Update* button.

4.2.2.2 *Acceptance Criteria*

1. Click on the **PRODUCT SPECIFICATIONS** link

2. Click **Update/Delete Existing Product Specification.**

3. Select product specification file that was just updated

4. Verify that the changes made to the fields appear correctly.

4.2.3 Test DPS_3 (web form delete)

4.2.3.1 *Test Procedure*

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the **PRODUCT SPECIFICATIONS** link

4. Click **Update/Delete Existing Product Specification.**

5. Select product specification file modified in test DPS_2

6. Press the *Delete* button.

4.2.3.2 *Acceptance Criteria*

1. Click on the **PRODUCT SPECIFICATIONS** link

2. Click **Update/Delete Existing Product Specification.**

3. Verify that the file deleted no longer appears in the list.

4.2.4 Test DPS_4 (automated e-mail add)

4.2.4.1 *Test Procedure*

1. Edit variable values in product_specs.pl and execute it. See Table C - 14 in the Interface Control Document for full description of fields

4.2.4.2 Acceptance Criteria

1. Click on the ***PRODUCT SPECIFICATIONS*** link

2. Click ***Update/Delete Existing Product Specification.***

3. Select product specification file that was just updated

4. Verify that the changes made to the fields appear correctly.

4.3 Problem Report, Change Request, Change Notification (CR)

The purpose of this test is to verify the problem reporting and change request handling system at the AIM PDC. The ability to add, delete, and modify a Problem Report / Change Request via web form will be tested.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	*Automated E-mail*
Add	CR_1	
Modify	CR_2	
Delete	CR_3	

4.3.1 Test CR_1 (web form add)

4.3.1.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the ***Admin*** to access the administrative section of the website and provide the proper username / password.

3. Click on the ***CHANGE REQUEST*** link

4. Click ***New Change Request.***

5. Fill in the required fields in the form.

6. Press the ***Submit*** button.

4.3.1.2 Acceptance Criteria

1. Click *Update/Delete Change Request.*

2. Select the current month and year

3. Click *Show Reports.*

4. Verify that the change request just submitted is in the list and all fields are correct.

4.3.2 Test CR_2 (web form modify)

4.3.2.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *CHANGE REQUEST* link.

4. Click *Update/Delete Change Request.*

5. Select the current month and year.

6. Click *Show Reports.*

7. Select the change request created in CR_1.

8. Modify each field of the change request individually and collectively.

9. Click *Update Request.*

4.3.2.2 Acceptance Criteria

1. Click *Show Reports.*

2. Verify that all of the changes made to the change request appear correctly.

4.3.3 Test CR_3 (web form delete)

4.3.3.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the ***CHANGE REQUEST*** link.

4. Click ***Update/Delete Change Request.***

5. Select the current month and year.

6. Click ***Show Reports.***

7. Select the change request created in CR_1 and modified in CR_2.

8. Click ***Delete Request.***

4.3.3.2   Acceptance Criteria

1. Click ***Show Reports.***

2. Verify that the change request created in CR_1 is no longer in the list.

4.4   Product Availability Notice (PAN)

The purpose of this test is to verify the ability to transfer meta-data for the science data product files to the AIM PDC. The ability to add, delete, and modify a Product Availability Notice message via automated e-mail will be tested.

- **Test Class:**
  - ○ Desk check testing – output will be manually inspected and analyzed.
  - ○ Erroneous input – values outside the input domain (erroneous values) will be used to test error handling, error recovery, and reporting of errors.
- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	*Automated E-mail*
Add		PAN_1
Modify		PAN_2
Delete		PAN_3

4.4.1   Test PAN_1 (automated e-mail add)

4.4.1.1   Test Procedure

1. Each instrument DPC should obtain one day of instrument data from the AIM MOC. This data should be for the same day / time period for all three instruments.

2. Merge simulated science data into the recorded instrument data from the MOC as needed to facilitate processing. This data wil be used as input for the DPC's science data processing system.

3. Process the merged data into the various science data products as specified in the AIM Data Management Plan. There should be one day's worth of NetCDF files produced for each data product.

4. Run the PAN generation scripts on the NetCDF files produced to generate the necessary PANs, save a copy of the PANs locally, and transmit the PANs (via e-mail) to the AIM PDC.

5. Re-run the PAN generation scripts on the NetCDF files to send duplicate PANs to the AIM PDC.

6. Manually e-mail a copy of the PANs created in step 4 to the AIM PDC, but using a bogus **From:** e-mail address.

7. Modify the copies of the PANs created in step 4, so that the URLs are no longer valid.

8. Manually e-mail the modified PANs created in step 7 to the AIM PDC

4.4.1.2 Acceptance Criteria

1. Check the e-mail inbox for the instrument DPC. There should be a PAN response message for each of the PAN sent in test procedure steps 4, 5, and 8. The PANs sent in step 6 should not produce PAN responses.

    1. The PANs sent in step 4 above should produce PAN responses indicating that the PAN was accepted and ingested into the catalog.

    2. The PANs sent in step 5 above should produce PAN responses indicating a "duplicate entry" and that the PAN was not ingested into the catalog.

    3. The PANs sent in step 8 above should produce PAN responses indicating an "invalid URL" and that the PAN was not ingetsed into the catalog.

2. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

3. Click on the *Data Services* tab/link.

4. Click on the *GET DATA* link under the *SERVICES* menu.

5. Select the proper instrument.

6. Select the *Year* then *Month* then *Day* for the PANs created and e-mailed in the test procedure above.

7. The NetCDF files generated steps 1-3 above should be listed with a URL link for the file.

8. Click on the link to download a NetCDF file and use *ncdump* or similar utility to verify that it is the file generated above and has the proper global and variable attributes.

9. Repeat step 8 for all listed files.

4.4.2 Test PAN_2 (automated e-mail modify)

4.4.2.1 Test Procedure

1. Using the each of the NetCDF files produced in test **PAN_1** run the PAN generation scripts with the *modified* flag set.

2. Transmit (e-mail) the PANs created in step 1 to the AIM PDC.

4.4.2.2 Acceptance Criteria

1. Check the e-mail inbox for the instrument DPC. There should be a PAN response message for each of the PAN sent in test procedure steps 2. The PAN responses should indicate that the PAN was accepted and the catalog was updated / modified.

2. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

3. Click on the *Data Services* tab/link.

4. Click on the *GET DATA* link under the *SERVICES* menu.

5. Select the proper instrument.

6. Select the *Year* then *Month* then *Day* for the PANs created and e-mailed in the test procedure above.

7. The NetCDF files from steps 1 above should be listed with a URL link for the file.

8. Click on the link to download a NetCDF file and use *ncdump* or similar utility to verify that it is the file generated above and has the proper global and variable attributes.

9. Repeat step 8 for all listed files.

4.4.3 Test PAN_3 (automated e-mail delete)

4.4.3.1 Test Procedure

1. Using the each of the NetCDF files produced in test **PAN_1** run the PAN generation scripts with the *delete* flag set.

2. Transmit (e-mail) the PANs created in step 1 to the AIM PDC.

4.4.3.2   Acceptance Criteria

1. Check the e-mail inbox for the instrument DPC. There should be a PAN response message for each of the PAN sent in test procedure steps 2. The PAN responses should indicate that the PAN was accepted and the PAN entry in the catalog was deleted.

2. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

3. Click on the *Data Services* tab/link.

4. Click on the *GET DATA* link under the *SERVICES* menu.

5. Select the proper instrument.

6. Select the *Year* then *Month* then *Day* for the PANs created and e-mailed in the test procedure above.

7. None of the NetCDF files used in step 1 above should be listed.

5   SDS Internal Interface 2 (PDC to DPC)

5.1   Product Availability Notice Response (PAN_RES)

The purpose of this test is to verify the ability of the AIM PDC to respond to Product Availability Notices. This test is actually part of the PAN test above.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	*Automated E-mail*
Add		PAN_RES_1
Modify		PAN_RES_2
Delete		PAN_RES_3

5.1.1   Test PAN_RES_1 (automated e-mail add)

5.1.1.1   Test Procedure

This test can be run as part of Test Procedure 4.4.1.1. If it is to be run separately, please follow the steps in 4.4.1.1.

5.1.1.2   Acceptance Criteria

The acceptance criteria for test PAN_RES_1 is the same as criteria 1 in 4.4.1.2, i.e.:

1. Check the e-mail inbox for the instrument DPC. There should be a PAN response message for each of the PAN sent in test procedure 4.4.1.1 steps 4, 5, and 8. The PANs sent in step 6 should not produce PAN responses.

   1. The PANs sent in step 4 above should produce PAN responses indicating that the PAN was accepted and ingested into the catalog.

   2. The PANs sent in step 5 above should produce PAN responses indicating a "duplicate entry" and that the PAN was not ingested into the catalog.

   3. The PANs sent in step 8 above should produce PAN responses indicating an "invalid URL" and that the PAN was not ingetsed into the catalog.

5.1.2 Test PAN_RES_2 (automated e-mail modify)

5.1.2.1   Test Procedure

This test can be run as part of Test Procedure 4.4.2.1. If it is to be run separately, please follow the steps in 4.4.2.1.

5.1.2.2   Acceptance Criteria

The acceptance criteria for test PAN_RES_2 is the same as criteria 1 in 4.4.2.2, i.e.:

1. Check the e-mail inbox for the instrument DPC. There should be a PAN response message for each of the PAN sent in test procedure steps 2. The PAN responses should indicate that the PAN was accepted and the catalog was updated / modified.

5.1.3 Test PAN_RES_3 (automated e-mail delete)

5.1.3.1   Test Procedure

This test can be run as part of Test Procedure 4.4.3.1. If it is to be run separately, please follow the steps in 4.4.3.1.

5.1.3.2   Acceptance Criteria

The acceptance criteria for test PAN_RES_3 is the same as criteria 1 in 4.4.3.2, i.e.:

1. Check the e-mail inbox for the instrument DPC. There should be a PAN response message for

each of the PAN sent in test procedure steps 2. The PAN responses should indicate that the PAN was accepted and the PAN entry in the catalog was deleted.

6 SDS Internal Interface 3 (MOC to PDC)

6.1 Mission Status / Data Quality Report (MSDQ)

The purpose of this test is to verify the ability of the MOC to transfer Mission Status and Data Quality reports to the PDC. Mission Status and Data Quality reports are transferred to the PDC either via web form or automated e-mail. The ability to add, delete, and modify MSDQ via web form and automated e-mail will be tested.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	*Automated E-mail*
Add	MSDQ_1	MSDQ_4
Modify	MSDQ_2	
Delete	MSDQ_3	

6.1.1 Test MSDQ_1 (web form add)

6.1.1.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* tab to access the administrative section of the website and provide the proper username / password.

3. Click on the *REPORTS* link

4. Click *Add New Report.*

5. Click *Browse* and select the file or document to be uploaded.

6. Select *Mission Status Report*

7. Fill in the remaining fields in the form – remember the Gen. Date and Data Date values.

8. Press the *Upload* button.

9. Click *Browse* and select a file or document to upload

10. Select *Data Quality Report.*

11. Fill in the remaining fields in the form – remember the Gen. Date and Data Date values.

12. Press the *Upload* button

6.1.1.2   Acceptance Criteria

1. Click on the *Instrument Status* tab.

2. Click *Mission Status Reports.*

3. Select a time period that includes the Gen. Date that was input.

4. Press the *Submit* button.

5. Verify the file that was just uploaded is in the list and click on its link

6. Verify the contents of the file.

7. Click on the *Data Services* tab.

8. Click the *Data Quality Reports* link*.*

9. Select a time period that includes the Gen. Date that was input.

10. Click on *Get Data Quality Reports*.

11. Verify the file that was just uploaded is in the list and click on its link

12. Verify the contents of the file.

6.1.2   Test MSDQ_2 (web form modify)

6.1.2.1   Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* tab to access the administrative section of the website and provide the proper username / password.

3. Click on the *REPORTS* link

4. Click *Update/Delete Existing Report.*

5. Select *Mission Status Report.*

6. Select the month and year of the Gen. Date of the mission status report uploaded in 6.1.1.1

7. Click *Show Reports.*

8. Select the appropriate file from the list displayed.

9. Modify each of the fields and click *Update Report.*

10. If you modified the Gen. Date, remember the values input.

11. Select *Data Quality Report.*

12. Select the month and year of the Gen. Date of the data quality report uploaded in 6.1.1.1

13. Click *Show Reports.*

14. Select the appropriate file from the list displayed.

15. Modify each of the fields and click *Update Report.*

16. If you modified the Gen. Date, remember the values input.

6.1.2.2   Acceptance Criteria

1. Click on the *Instrument Status* tab.

2. Click *Mission Status Reports.*

3. Select a time period that includes the Gen. Date that was input.

4. Press the *Submit* button.

5. Verify the file that was just uploaded is in the list and click on its link

6. Verify the contents of the file.

7. Click on the *Data Services* tab.

8. Click the *Data Quality Reports* link*.*

9. Select a time period that includes the Gen. Date that was input.

10. Click on *Get Data Quality Reports*.

11. Verify the file that was just uploaded is in the list and click on its link

12. Verify the contents of the file.

6.1.3   Test MSDQ_3 (web form delete)

6.1.3.1   Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *REPORTS* link

4. Click *Update/Delete Existing Report.*

5. Select *Mission Status Report.*

6. Select the month and year of the Gen. Date of the mission status report uploaded in 6.1.1.1

7. Click *Show Reports.*

8. Select the appropriate file from the list displayed.

9. Modify each of the fields and click *Update Report.*

10. If you modified the Gen. Date, remember the values input.

11. Select *Data Quality Report.*

12. Select the month and year of the Gen. Date of the data quality report uploaded in 6.1.1.1

13. Click *Show Reports.*

14. Select the appropriate file from the list displayed.

15. Modify each of the fields and click *Update Report.*

16. If you modified the Gen. Date, remember the values input.

17. Press the *Delete* button.

6.1.3.2   Acceptance Criteria

1. Click on the *Instrument Status* tab.

2. Click *Mission Status Reports.*

3. Select a time period that includes the Gen. Date that was input.

4. Press the *Submit* button.

5. Verify the file that was just deleted is no longer in the list.

6. Click on the *Data Services* tab.

7. Click the *Data Quality Reports* link.

8. Select a time period that includes the Gen. Date that was input.

9. Click on *Get Data Quality Reports*.

10. Verify the file that was just deleted is no longer in the list.

11. Verify the contents of the file.

6.1.4 Test MSDQ_4 (automated e-mail add)

6.1.4.1 Test Procedure

1. Modify the variables in the routine SendReports.pland execute it.

6.1.4.2 Acceptance Criteria

1. Click on the *Instrument Status* tab.

2. Click *Mission Status Reports.*

3. Select a time period that includes the Gen. Date that was input.

4. Press the *Submit* button.

5. Verify the file that was just uploaded is in the list and click on its link

6. Verify the contents of the file.

7. Click on the *Data Services* tab.

8. Click the *Data Quality Reports* link*.*

9. Select a time period that includes the Gen. Date that was input.

10. Click on *Get Data Quality Reports*.

11. Verify the file that was just uploaded is in the list and click on its link

12. Verify the contents of the file.

7 SDS External Interface 3 (EPO, Science Team, CO-I's to PDC)

7.1 Supplementary Data Upload (SDU)

The purpose of this test is to verify the SDU handling capability of the Science Data System, particularly the AIM PDC. The SDU is a message containing the description of a supplementary data product as an attachment. The ability to add, delete, and modify a SDU via web form will be tested.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	Automated E-mail
Add	SDU_1	
Modify	SDU_2	
Delete	SDU_3	

7.1.1 Test SDU_1 (web form add)

7.1.1.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *DATA TRANSFER* link

4. Click *Add Data Transfer.*

5. Click *Browse* and select the file to be uploaded.

6. Fill in the required fields in the form (particularly the date/time).

7. Press the *Upload* button.

7.1.1.2 Acceptance Criteria

1. Click on the *DATA TRANSFER* link

2. Click *Update/Delete Existing Data Transfer.*

3. Select the Month and Year of the supplied with the file that was uploaded in 7.1.1.1.

4. Click *Show Reports.*

5. Select product specification file that was just uploaded

6. Verify that all the fields appear correctly.

7.1.2 Test SDU_2 (web form modify)

7.1.2.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper

username / password.

3. Click on the *DATA TRANSFER* link.

4. Click *Update/Delete Existing Data Transfer.*

5. Select the Month and Year of the supplied with the file that was uploaded in 7.1.1.1.

6. Click *Show Reports.*

7. Click on the name of the file uploaded in 7.1.1.1.

8. Modify each of the fields in the form.

9. Press the *Update* button.

7.1.2.2 Acceptance Criteria

1. Click on the *DATA TRANSFER* link

2. Click *Update/Delete Existing Data Transfer.*

3. Select the Month and Year of the supplied with the file that was uploaded in 7.1.2.1.

4. Click *Show Reports.*

5. Select product specification file that was just uploaded

6. Verify that all the fields appear correctly.

7.1.3 Test SDU_3 (web form delete)

7.1.3.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* to access the administrative section of the website and provide the proper username / password.

3. Click on the *DATA TRANSFER* link.

4. Click *Update/Delete Existing Data Transfer.*

5. Select the Month and Year of the supplied with the file that was modified in 7.1.2.1.

6. Click *Show Reports.*

7. Click on the name of the file modified in 7.1.2.1.

8. Press the *Delete* button.

7.1.3.2 Acceptance Criteria

1. Click on the *DATA TRANSFER* link

2. Click *Update/Delete Existing Data Transfer.*

3. Select the Month and Year supplied with the file that was deleted in 7.1.3.1.

4. Click *Show Reports.*

5. Verify that the file deleted in 7.1.3.1 is not in the list.

7.2 Document Upload (DU)

The purpose of this test is to verify the SDU handling capability of the Science Data System, particularly the AIM PDC. The SDU is a message containing the description of a supplementary data product as an attachment. The ability to add, delete, and modify a SDU via web form will be tested.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

	Web Form	**Automated E-mail**
Add	DU_1	
Modify		
Delete		

7.2.1 Test DU_1 (web form add)

7.2.1.1 Test Procedure

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Admin* tab to access the administrative section of the website and provide the proper username / password.

3. Click on the *UPLOAD* link

4. Click *Browse* and select the document to be uploaded.

5. Fill in the required fields in the form.

6. Press the *Upload* button.

7.2.1.2 Acceptance Criteria

1. Click on the *Science* link

2. Click *Documents* link.

3. Verify that the file uploaded in 7.2.1.1 is in the list of files

4. Download the file that was just uploaded by clicking on the filename

5. Verify that the file downloaded is the same as the file uploaded in 7.2.1.1

7.3 User Interface Inspection (UII)

The purpose of this test is to examine the PDC web site and evaluate its operation. The user will surf through the entire web site and make notations of any problems, errors, poor wording, or awkward operations.

- **Test Class:** Desk check testing – output will be manually inspected and analyzed.

- **Test Level:** Interface level – evaluate compliance with internal and external interface requirements

7.3.1 Test UII_1

7.3.1.1 Test Procedure

1. Using a web browser, access the AIM web site (http://aim.hamptonu.edu/).

2. In any order, click on all the tabs and links and follow them until all pages of the web site have been visited.

3. For each page, note any:

   1. errors - links giving an error message,

   2. problems - links that don't do anything or seem to hang,

   3. wording – descriptions that are wrong, poor word choice, etc. If possible suggest better alternatives to what is there,

   4. operations – things work, but not like you think they should. If possible suggest a better alternative.

7. Click on the *UPLOAD* link

8. Click *Browse* and select the document to be uploaded.

9. Fill in the required fields in the form.

10. Press the *Upload* button.

7.3.1.2 Acceptance Criteria

1. Click on the *Science* link

2. Click *Documents* link*.*

3. Verify that the file uploaded in 7.2.1.1 is in the list of files

4. Download the file that was just uploaded by clicking on the filename

5. Verify that the file downloaded is the same as the file uploaded in 7.2.1.1

8 Other Tests

8.1 CVO Data Processing (CVO)

The purpose of this test is to verify the routine CVO data management capability of the Science Data System, particularly the AIM PDC. The routine CVO data processing / management consists of four basic steps.

1. Selection of the CVO data for each instrument (CIPS & SOFIE) by the respective DPC.

2. Transfer of the instrument CVO data from the DPC to the PDC

3. Merge the instrument CVO data files into a single AIM CVO data product.

4. Ingest the AIM CVO data product meta-data into the AIM PDC data catalog.

8.1.1 Test CVO_1

8.1.1.1 Test Procedure

1. Each instrument DPC generates NetCDF data product files as described in steps 1-3 of test procedure 4.4.1.1.

2. The SOFIE DPC will determine the latitude, latitude and altitude location of the CVO "box" and transmit that information to the CIPS DPC.

3. The SOFIE DPC will create a SOFIE CVO netCDF file based on the CVO box, and generate and transmit a PAN for that file to the PDC.

4. The CIPS DPC will create a CIPS CVO netCDF file based on the CVO box, and generate and transmit a PAN for that file to the PDC.

5. The AIM PDC will download the two files described by the PANs and merge them into a single AIM CVO data product netCDF file.

6. The AIM PDC will store the AIM CVO netCDF file and ingest its meta-data into the data catalog.

8.1.1.2 *Acceptance Criteria*

1. Using a web browser, access the AIM PDC web site (http://aim.hamptonu.edu/sds/).

2. Click on the *Data Services* tab.

3. Click on the *Get Data* link.

4. Click on the *CVO* link.

5. Click on the *YEAR* of the data.

6. Click on the *Month* of the data.

7. Click on the *Day* of the data.

8. Verify that there is an entry for the AIM CVO data file that was just produced.

9. Click on the filename and download the CVO data file.

10. Use *ncdump* or similar utility to view the contents of the netCDF file.

11. Verify the data is correct based on the two input CVO data files.

9 Test Schedule

10 Data Recording, Reduction, and Analysis

11 Requirements Traceability Matrix

	GST 271	GST 272	GST 273	GST 274	GST 275	GST 276	GST 277	GST 278	GST 279	GST 280	GST 281	GST 290	GST 292
DPC_URL													
DPC_URL_1													
DPC_URL_2													
DPC_URL_3													
DPC_URL_4													X
DPC_URL_5													X
DPS													
DPS_1					X								
DPS_2					X								
DPS_3					X								
DPS_4					X								X
CR													
CR_1												X	
CR_2												X	
CR_3												X	
PAN													
PAN_1	X	X			X	X	X	X		X			X
PAN_2	X	X			X	X	X	X		X			X
PAN_3	X	X			X	X	X	X		X			X
PAN_RES													
PAN_RES_1													X
PAN_RES_2													X
PAN_RES_3													X
MSDQ													
MSDQ_1													
MSDQ_2													
MSDQ_3													
MSDQ_4													X
SDU													
SDU_1													
SDU_2													
SDU_3													
DU													
DU_1													
UII													
UII_1													
CVO													
CVO_1			X	X					X		X		X

12 Acronyms and Abbreviations

1 Test Summary Matrices

2 AIM SDS End-to-End Test Cases