

# Alaska SAR Facility

Modified Antarctic Mapping Mission  
System Test Plan and Procedures



ASF-00-TES-???  
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## Document Log

<u>Date</u>	<u>Description of Changes</u>
6/30/2000	Initial draft released
7/7/2000	Additional testing for Science Team, Mission Planning, TDRS and orbit maintenance added and some minor editorial changes by N. La Belle-Hamer

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## **Introduction**

### ***Related Documents***

[1] Antarctic Mapping Mission –2, RADARSAT-1 Antarctic Mapping Project, Science Requirements Document, June 22, 2000.

[2] Modified Antarctic Mapping Mission, ASF Functional Requirements Document, ASF-00-REQ001-0.9, June 22, 2000.

[3] Modified Antarctic Mapping Mission (MAMM) Operations Plan, ASF-00-OPS001-1.0, June 22, 2000.

### ***Contents***

This document contains the test plan and procedures for the Modified Antarctic Mapping Mission. Test results will be recorded in a child document following testing. This test effort is being undertaken to ensure that ASF is ready for the Modified Antarctic Mapping Mission.

### ***Change Control***

All revisions to this document will be noted in the document log.

# Modified Antarctic Mapping Mission System Test Plan

## ***Introduction***

During the fourth quarter of the year 2000, the Alaska Synthetic Aperture RADAR Facility (ASF) will be performing the acquisition phase of the second Modified Antarctic Mapping Mission (MAMM). A period of testing and rehearsals will precede this mission to ensure that ASF and all other participants, including the Canadian Space Agency (CSA) and the MAMM science team are ready. These activities will include mission planning, re-planning, data acquisition, and limited data distribution. Many of the ground receiving station operational procedures will not vary widely from standard defined procedures, but the intensity of effort will increase for many of the facilities. Consequently, a thorough, documented set of rehearsals is planned to stress each supporting element of the project. These activities will ensure the readiness of all parties involved. Although system testing and rehearsals are slightly different in nature, both must be done prior to the August 9 readiness review. Therefore, this document will embody both system tests and rehearsals. Both will be referred to as tests for the remainder of this document.

## ***Test Focus***

AMM system tests and rehearsals are designed to evaluate performance and readiness in 5 areas:

- 1) Acquisition planning, reporting, and replanning at CSA;
- 2) Acquisitions, validation and reporting activities at the McMurdo Ground Receiving Station;
- 3) Acquisitions, validation and reporting activities at the Alaska SAR Facility and sister organizations at PSS and GSS;
- 4) CSA flight operations and orbit maintenance strategies;
- 5) Science team validation and reporting procedures and interfaces.

# Mission Planning Test Procedures

## ***MAMM-STP-MP-1***

**Objective:** Verify that a 3-orbit payload outage can be re-planned at CSA by the NASA team.

### **Requirement(s) Under Test:**

- From Science Requirement Doc

### **Inputs:**

- Information sheet from CSA that a 3-orbit outage occurred

### **Outputs:**

- New acquisition plan ready for submission to CSA

### **Systems involved:**

- Swath Planning Application (SPA)
- Mission Planning Tools
- CSA MMO/DBMS

### **Actors:**

- NASA Mission Planner
- Science Team Lead (PI)
- CSA Planners
- 

**Pass Criteria:** New requests are planned and successfully submitted to MMO/DBMS. New schedules are generated for the reception facilities.

### **Procedures:**

1. MMO informs NASA team of outage
2. NASA team replans and submits to Technical Coordinator
3. Technical Coordinator submits to MMO
4. MMO generates and transmits new reception schedule (.rsh)
5. MMO informs reception facilities of new schedule/files

**Criticality of Test:** Mission Critical

## **MAMM-STP-MP-2**

**Objective:** Verify that a 24-hour payload outage can be re-planned at CSA by the NASA team.

### **Requirement(s) Under Test:**

- From Science Requirements doc

### **Inputs:**

- Information sheet from CSA stating a 24-hour outage has occurred

### **Outputs:**

- New acquisition plan ready for submission to CSA

### **Systems involved:**

- Swath Planning Application (SPA)
- Mission Planning tools
- CSA MMO/DBMS

### **Actors:**

- NASA Mission Planner
- Science Team Lead (PI)
- CSA Planners

**Pass Criteria:** New requests are planned and successfully submitted to MMO/DBMS. New schedules are generated for the reception facilities.

### **Procedures:**

1. MMO informs NASA team of outage
2. NASA team replans and submits to Technical Coordinator
3. Technical Coordinator submits to MMO
4. MMO generates and transmits new reception schedule (.rsh)
5. MMO informs reception facilities of new schedule/files

**Criticality of Test:** Mission Critical



### **MAMM-STP-MP-3**

**Objective:** Verify that a 3-orbit outage due to launch conflict can be re-planned at CSA by the NASA team.

**Requirement(s) Under Test:**

- From Science Requirement Doc

**Inputs:**

- Information sheet from **WFF** that a 3-orbit outage will occur due to launch conflict

**Outputs:**

- New acquisition plan ready for submission to CSA

**Systems involved:**

- Swath Planning Application (SPA)
- Mission Planning Tools
- CSA MMO/DBMS
- MGS/WFF

**Actors:**

- NASA Mission Planner
- Science Team Lead (PI)
- CSA Planners
- MGS/WFF planner

**Pass Criteria:** New requests are planned and successfully submitted to MMO/DBMS. New schedules are generated for the reception facilities.

**Procedures:**

1. WFF informs CSA of launch conflict and abandoned orbits
2. NASA team replans and submits to Technical Coordinator
3. Technical Coordinator submits to MMO
4. MMO generates and transmits new reception schedule (.rsh)
5. MMO informs reception facilities of new schedule/files

**Criticality of Test:** Mission Critical

## **TDRSS Test Procedures**

### ***MAMM-STP-TDR-1***

**Objective:** Verify that the MAMM Science Team can set up the TDRS and associated links for data to be piped to JPL from MGS during mission.

#### **Requirement(s) Under Test:**

- From Science Requirements doc

#### **Inputs:**

- 

#### **Outputs:**

- TDRS link set up and ready for data transmission

#### **Systems involved:**

- WFF
- MGS
- MAMM Science Team (JPL and OSU)

#### **Actors:**

- Science Team Lead (PI)
- WFF TDRS planners
- MGS ground station employees
- JPL Science Team members

#### **Pass Criteria:**

TDRS and DOM/SAT or equivalent link set up and ready to transmit data.  
Data is acquired and sent to White Sands via TDRSS.

#### **Procedures:**

1. JPL informs ASF about acquisitions requiring TDRSS
2. ASF informs WFF about acquisitions requiring TDRSS
3. WFF schedules TDRSS link
4. Data is acquired and sent via TDRSS to White Sands

**Criticality of Test:** Mission **Important**

# Science Team Test Procedures

## ***MAMM-STP-ST-1***

**Objective:** Verify that the Science Team can monitor Acquisition Coverage during mission.

### **Requirement(s) Under Test:**

- From Science Requirements doc

### **Inputs:**

- SRF
- **DQM or Equivalent**

### **Outputs:**

- Coverage maps

### **Systems involved:**

- Swath Planning Application (SPA)
- ERDAS Imagine

### **Actors:**

- Science Team Lead (PI)
- ASF Science Team members
- OSU Science Team members
- ASF Operations Center
- MGS/WFF

**Pass Criteria:** Demonstrated capability to construct reliable coverage maps

### **Procedures:**

1. ASF receives **DQM or equivalent** files from MGS **via FTP** and generates SRF files from either OBR data downlinked at ASF or data sent from PSS and GSS via Fed Ex.
2. ASF provides DQM and SRF files along with acquisition reports to science team.
3. Science team creates daily coverage maps based on this information.

Criticality of Test: **Mission Critical**

## **MAMM-STP-ST-2**

**Objective:** Verify that the Science Team can monitor Data Quality during mission.

### **Requirement(s) Under Test:**

- From Science Requirements doc

### **Inputs:**

- SRF
- DQM
- Quick Look Products
- L0

### **Outputs:**

- Report on quality to the Science Team Lead (Ken Jezek).
- End Products
- Distribution of L0 data to other science team members

### **Systems involved:**

- Swath Planning Application (SPA)
- ERDAS Imagine

### **Actors:**

- Science Team Lead (PI)
- ASF Science Team members
- OSU Science Team members
- ASF Operations Center

**Pass Criteria:** Demonstrates capability to process, distribute and analyze data

### **Procedures:**

1. Science team requests Q/L processing.
2. ASF creates quick look product.
3. ASF deliver product to science team
4. Science team requests L0 data
5. ASF creates L0 product
6. ASF science team distributes product
7. Science team creates Image and InSAR products

**Criticality of Test:** Mission Critical

### **MAMM-STP-ST-3**

**Objective:** Verify that the Science Team can analyze Baseline during mission.

**Requirement(s) Under Test:**

- From Science Requirements doc

**Inputs:**

- State vectors

**Outputs:**

- Baseline assessments

**Systems involved:**

- Swath Planning Application (SPA)
- FTP site

**Actors:**

- Science Team Lead (PI)
- ASF Science Team members
- OSU Science Team members
- ASF Operations Center
- CSA

**Pass Criteria:** Demonstrated ability to monitor baseline

**Procedures:**

1. CSA provides predicted state vectors to ASF
2. ASF stages state vectors to FTP site
3. Science team retrieves state vector data from ASF
4. Science team computes baselines
5. CSA provides restituted state vectors to ASF
6. ASF updates FTP site and identifies update state vector files
7. Science team re-computes baselines

**Criticality of Test:** Mission Critical

## **Orbit Maintenance Test Procedures**

### ***MAMM-STP-OM-1***

**Objective:** Verify the 1 Km guard band control for orbit maintenance.

#### **Requirement(s) Under Test:**

- From Science Requirements doc

#### **Inputs:**

- Orbit parameters

#### **Outputs:**

- Guard band values

#### **Systems involved:**

- CSA Orbit Maintenance

#### **Actors:**

- Science Team Lead (PI)
- CSA Orbit Maintenance Personnel
- JPL Orbit experts

**Pass Criteria:** verification of Orbit Maintenance Strategy

#### **Procedures:**

1. CSA begins controlling satellite to maintain 1 km guard band
2. Orbit determination data are evaluated by CSA and JPL

**Criticality of Test:** Mission Critical

# ASF MAMM Functionality Test Procedures

## **MAMM-STP-AP-1**

**Objective:** Verify that ASF can successfully submit acquisition requests to CSA

### **Requirement(s) Under Test:**

- 3.4.3 ASF shall ingest the test mission acquisition plan
- 3.4.4 ASF shall submit the test mission acquisition plan to the MMO
- 3.5.1 ASF shall receive the MAMM acquisition plan from JPL.
- 3.5.2 ASF shall combine the MAMM acquisition plan with the existing acquisition requests
- 3.5.3 ASF shall submit the combined acquisition plan to the RADARSAT Mission Management Office (MMO).

### **Inputs:**

- HTML User Request Files (URFs)

### **Outputs:**

- Confirmation of ingestion by CSA

### **System(s) Involved:**

- Swath Planning Application (SPA)
- Mission Planning tools
- CSA MMO/DBMS
- ODSys

### **Actors:**

- ASF Mission Planner
- Science Team or JPL
- CSA planners

### **Pass Criteria:**

- All requests are successfully ingested by CSA into the MMO/DBMS.

### **Procedures:**

1. Science Team (or analog) provides acquisition plan in HTML format URF files to ASF Mission Planners
2. ASF Mission planner submits some of the URF files and existing requests to CSA using Mission Planning Tools which automatically submit and approve URF files
3. CSA confirms successful ingestion of files

**Criticality of Test:** Mission Critical

**Comments:** Requirements 3.5.1, 3.5.2, and 3.5.3 are verified by demonstration as a result of the successful verification by test of requirements 3.4.3 and 3.4.4



## **MAMM-STP-AP-2**

**Objective:** Verify that ASF can successfully replan and resubmit acquisition requests to CSA

### **Requirement(s) Under Test:**

- 3.5.4 ASF shall provide adjustment of the MAMM acquisition plan based on feedback from MMO

### **Inputs:**

- HTML User Request Files (URFs)
- Contact from CSA stating that a replan is required

### **Outputs:**

- Confirmation of ingestion by CSA

### **System(s) Involved:**

- Swath Planning Application (SPA)
- Mission Planning tools
- CSA MMO/DBMS
- ODSys

### **Actors:**

- ASF Mission Planner
- Science Team or JPL?
- CSA planners

### **Pass Criteria:**

- All requests are successfully ingested by CSA into the MMO/DBMS.

### **Procedures:**

1. CSA Planners inform ASF of a need to replan acquisition for a period of time
2. ASF Mission planners replan affected acquisitions
3. ASF Mission planners resubmit URF files to CSA using Mission Planning Tools which automatically submit and approve URF files
4. CSA confirms successful ingestion of files

**Criticality of Test:** Mission Critical

**Comments:** There are many different reasons ASF would need to replan acquisitions. The purpose of this test is to demonstrate that requirement 3.5.4 can be met for any generic instance. Replans for various possibilities should be exercised in rehearsals.

## **MAMM-STP-DA-1**

**Objective:** Verify that ASF can successfully receive RADARSAT-1 data.

### **Requirement(s) Under Test:**

- (Constraint) 3.1.2 ASF shall use only the 10 meter antenna to collect MAMM mission data.
- 3.2.1 ASF shall support the acquisition of Antarctic Mapping data from RADARSAT-1 (north looking) August through November of 2000.
- 3.5.5 ASF shall acquire the RADARSAT data transmitted directly from RADARSAT-1 to ASF
- 3.5.10 ASF shall archive the MAMM mission data in a raw format.

### **Inputs:**

- CSA Scheduling files
- RADARSAT-1 Raw Signal Data

### **Outputs:**

- High Density Digital Recordings of RADARSAT data

### **System(s) Involved:**

- Flight Agency Interface Function (FAIF)
- Acquisition Planning Subsystem (APS)
- Host Controller (HC)
- 10 meter Antenna
- Sony DIR-1000 High Density Digital Recorders (HDDRs)
- Information Management Subsystem (IMS)

### **Actors:**

- ASF Acquisition Planner
- ASF Operator(s)
- CSA Planners

### **Pass Criteria:**

- RADARSAT data successfully received from RADARSAT and stored on Sony ID-1 tape

### **Procedures:**

1. CSA planner prepares and sends reception request file (.rrq).
2. FAIF retrieves reception request file.
3. ASF acquisition planner ingests reception request into APS and informs CSA of any conflicts.
4. CSA planner creates reception schedule file (.rsh).
5. FAIF retrieves reception schedule file.

6. ASF acquisition planner ingests reception schedule into APS and informs CSA of any conflicts.
7. ASF acquisition planner generates WOS file with this pass scheduled on the 10 meter antenna and state vectors.
8. ASF acquisition planner sends WOS and state vectors to HC.
9. ASF operator monitors HC, 10 meter antenna, and Sony HDDRs during RADARSAT pass.
10. HC sends appropriate messages to IMS.
11. ASF operator notifies interested parties in the case of a data loss.
12. IMS sends reception report to CSA.
13. ASF operator dismounts data tape from Sony HDDR.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates basic functionality to receive RADARSAT data using the 10 meter antenna at ASF and store the data on tape. Other tests demonstrate that the data is processable.

## **MAMM-STP-DA-2**

**Objective:** Verify that ASF can successfully receive Non-MAMM data.

### **Requirement(s) Under Test:**

- (Constraint) 3.1.1 ASF shall acquire non-MAMM data during MAMM.

### **Inputs:**

- ESA Scheduling files
- ERS-2 Raw Signal Data

### **Outputs:**

- High Density Digital Recordings of ERS-2 data

### **System(s) Involved:**

- Flight Agency Interface Function (FAIF)
- Acquisition Planning Subsystem (APS)
- Host Controller (HC)
- 10 or 11 meter Antenna
- Sony DIR-1000 High Density Digital Recorders (HDDR)
- Information Management Subsystem (IMS)

### **Actors:**

- ASF Acquisition Planner
- ASF Operator(s)
- ESA Planners

### **Pass Criteria:**

- ERS-2 data successfully received from ERS-2 and stored on Sony ID-1 tape

### **Procedures:**

1. ESA planner prepares and sends scheduling file(s).
2. FAIF retrieves scheduling file(s).
3. ASF acquisition planner ingests scheduling file into APS and informs ESA of any conflicts.
4. ASF acquisition planner generates WOS file and state vectors.
5. ASF acquisition planner sends WOS and state vectors to HC.
6. ASF operator monitors HC, antenna, and Sony HDDRs during ERS-2 pass.
7. HC sends appropriate messages to IMS.
8. ASF operator notifies interested parties in the case of a data loss.
9. IMS sends reception report to ESA.
10. ASF operator dismounts data tape from Sony HDDR.

**Criticality of Test:** Mission Constraint

**Comments:** This test demonstrates basic functionality to receive non-RADARSAT data at ASF and store the data on tape. This test is not mission critical since non-RADARSAT data is not a part of the MAMM mission.

### **MAMM-STP-DA-3**

**Objective:** Verify that ASF can successfully receive MAMM data from Gatineau Satellite Station.

#### **Requirement(s) Under Test:**

- 3.5.6 ASF shall receive MAMM mission data from the Gatineau receiving station.
- 3.5.6.1 ASF shall provide via airmail any required media to the Gatineau station before the start of the mission.
- 3.5.6.2 ASF shall verify phone communications between ASF and Gatineau for supporting MAMM.
- 3.5.6.3 ASF shall verify email communications between ASF and Gatineau for support of MAMM.
- 3.5.6.4 ASF shall provide for shipment of mission data from Gatineau to ASF.
- 3.5.6.5 ASF shall ingest (dub) MAMM mission data from Gatineau into the ASF archive.
- 3.5.6.6 ASF shall acknowledge successfully receipt of MAMM mission data back to the Gatineau receiving station.

#### **Inputs:**

- RADARSAT-1 raw data tape(s) from the Gatineau receiving station

#### **Outputs:**

- RADARSAT-1 data received at the Gatineau receiving station successfully archived at ASF.

#### **System(s) Involved:**

- Computer with email capability
- Foreign Station Ingest (FSI)
- Dub station
- Sony DIR-1000 High Density Digital Recorders (HDDRs)
- HD-96 High Density Digital Recorder
- Information Management Subsystem (IMS)
- Production Planning System (PPS)
- Raw Data Scanner (RDS)

#### **Actors:**

- ASF Operator(s)
- Gatineau Satellite Station (GSS) Operator(s)
- ASF Production Planner

#### **Pass Criteria:**

- Successful shipment of HD-96 media to GSS
- Successful telephone contact with GSS

- Successful email contact with GSS
- Successful shipment of HD-96 tape(s) containing RADARSAT data from GSS to ASF
- Successful ingest of data received at GSS into ASF archive
- Successful acknowledgement of data receipt at ASF to GSS

**Procedures:**

1. ASF operator ships HD-96 media to GSS.
2. ASF operator confirms delivery with delivery service.
3. ASF operator confirms delivery with GSS via phone.
4. ASF operator contacts GSS via email to confirm shipment of HD-96 tape containing data to ASF.
5. ASF operator receives tape from GSS.
6. ASF operator adds data to IMS using FSI.
7. ASF operator dubs HD-96 data to Sony ID-1.
8. Dub station informs IMS of new media for data.
9. IMS generates scan request.
10. ASF production planner expedites scan request to confirm validity of data.
11. ASF operator mounts tape on RDS.
12. RDS scans data.
13. ASF operator confirms validity of scan results.
14. ASF operator notifies GSS of successful ingest of data.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates basic functionality to receive RADARSAT data from GSS and ingest in into ASF's archive. It also shows that the data is readable following this process.

## **MAMM-STP-DA-4**

**Objective:** Verify that ASF can successfully receive MAMM data from the Prince Albert Satellite Station.

### **Requirement(s) Under Test:**

- 3.5.7 ASF shall receive MAMM mission data from the Prince Albert receiving station.
- 3.5.7.1 ASF shall provide via airmail any required media to the Prince Albert station before the start of the mission.
- 3.5.7.2 ASF shall verify phone communications between ASF and Prince Albert for supporting MAMM.
- 3.5.7.3 ASF shall verify email communications between ASF and Prince Albert for support of MAMM.
- 3.5.7.4 ASF shall provide for shipment of mission data from Prince Albert to ASF.
- 3.5.7.5 ASF shall ingest (dub) MAMM mission data from Prince Albert into the ASF archive.
- 3.5.7.6 ASF shall acknowledge successfully receipt of MAMM mission data back to the Prince Albert receiving station.

### **Inputs:**

- RADARSAT-1 raw data tape(s) from the Prince Albert receiving station

### **Outputs:**

- RADARSAT-1 data received at the Prince Albert receiving station successfully archived at ASF.

### **System(s) Involved:**

- Computer with email capability
- Foreign Station Ingest (FSI)
- Dub station
- Sony DIR-1000 High Density Digital Recorders (HDDRs)
- HD-96 High Density Digital Recorder
- Information Management Subsystem (IMS)
- Production Planning System (PPS)
- Raw Data Scanner (RDS)

### **Actors:**

- ASF Operator(s)
- Prince Albert Satellite Station (PASS) Operator(s)
- ASF Production Planner

### **Pass Criteria:**

- Successful shipment of HD-96 media to PASS



- Successful telephone contact with PASS
- Successful email contact with PASS
- Successful shipment of HD-96 tape(s) containing RADARSAT data from PASS to ASF
- Successful ingest of data received at PASS into ASF archive
- Successful acknowledgement of data receipt at ASF to PASS

**Procedures:**

1. ASF operator ships HD-96 media to PASS.
2. ASF operator confirms delivery with delivery service.
3. ASF operator confirms delivery with PASS via phone.
4. ASF operator contacts PASS via email to confirm shipment of HD-96 tape containing data to ASF.
5. ASF operator receives tape from PASS.
6. ASF operator adds data to IMS using FSI.
7. ASF operator dubs HD-96 data to Sony ID-1.
8. Dub station informs IMS of new media for data.
9. IMS generates scan request.
10. ASF production planner expedites scan request to confirm validity of data.
11. ASF operator mounts tape on RDS.
12. RDS scans data.
13. ASF operator confirms validity of scan results.
14. ASF operator notifies PASS of successful ingest of data.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates basic functionality to receive RADARSAT data from PASS and ingest in into ASF's archive. It also shows that the data is readable following this process.

## **MAMM-STP-DA-5**

**Objective:** Verify that ASF can successfully receive MAMM data from the McMurdo Ground Station.

### **Requirement(s) Under Test:**

- 3.5.8 ASF shall receive MAMM mission data from the McMurdo receiving station.
- 3.5.8.1 ASF shall provide via airmail any required media to the McMurdo station before the start of the mission.
- 3.5.8.2 ASF shall verify communications between ASF and McMurdo for supporting MAMM.
- 3.5.8.3 ASF shall ingest (dub) MAMM mission data from McMurdo into the ASF archive.
- 3.5.8.5 ASF shall acquire a Data Quality Memo (DQM) file from McMurdo within 48 hours of data reception

### **Inputs:**

- RADARSAT-1 raw data tape(s) from the McMurdo receiving station

### **Outputs:**

- RADARSAT-1 data received at the McMurdo receiving station successfully archived at ASF.

### **System(s) Involved:**

- Foreign Station Ingest (FSI)
- Dub station
- Sony DIR-1000 High Density Digital Recorders (HDDRs)
- Ampex DCRSi High Density Digital Recorder
- Information Management Subsystem (IMS)
- Production Planning System (PPS)
- Raw Data Scanner (RDS)

### **Actors:**

- ASF Operator(s)
- McMurdo Satellite Station (MGS) Operator(s)
- ASF Production Planner

### **Pass Criteria:**

- Successful shipment of DCRSi media to MGS
- Successful contact with MGS
- Successful shipment of DCRSi tape(s) containing RADARSAT data from MGS to ASF
- Successful ingest of data received at MGS into ASF archive
- Successful receipt of MGS DQM at ASF within 48 hours of a RADARSAT pass

**Procedures:**

1. ASF operator ships DCRSi media to MGS.
2. ASF operator confirms delivery with MGS.
3. MGS receives RADARSAT-1 Data.
4. MGS sends DQM message to ASF.
5. MGS sends DCRSi tape containing data to ASF.
6. ASF operator receives tape from MGS.
7. ASF operator adds data to IMS using FSI.
8. ASF operator dubs DCRSi data to Sony ID-1.
9. Dub station informs IMS of new media for data.
10. IMS generates scan request.
11. ASF production planner expedites scan request to confirm validity of data.
12. ASF operator mounts tape on RDS.
13. RDS scans data.
14. ASF operator confirms validity of scan results.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates basic functionality to receive RADARSAT data from MGS and ingest it into ASF's archive. It demonstrates that ASF can receive McMurdo DQM messages. It also shows that the data is readable following this process.

## **MAMM-STP-DP-1**

**Objective:** Verify that ASF can successfully process non-MAMM data during MAMM.

### **Requirement(s) Under Test:**

- (Constraint) 3.1.3 ASF shall process non-MAMM data during MAMM.

### **Inputs:**

- JERS-1, ERS-1, ERS-2, or RADARSAT ScanSAR raw data

### **Outputs:**

- Processed SAR image.

### **System(s) Involved:**

- Precision Processor (PP)
- ScanSAR Processor (SSP)
- Control Processor (CP)
- EOSDIS Data Gateway (EDG)
- Information Management Subsystem (IMS)
- Production Planning System (PPS)
- Raw Data Scanner (RDS)

### **Actors:**

- ASF Operator(s)
- ASF Production Planner
- Test Personnel

### **Pass Criteria:**

- SAR image processed successfully

### **Procedures:**

1. ASF test personnel place order or orders for data.
2. ASF production planner plans order.
3. ASF operator follows prompts of operational system to process data.
4. ASF operator performs image quality control.
5. ASF operator instructs IMS to process order to media.

**Criticality of Test:** Mission Constraint

**Comments:** This test demonstrates that ASF has the ability to process data that could be ordered either by science users or as part of a quicklook during MAMM. This test is not mission critical as this data is not used during MAMM.

## **MAMM-STP-DP-2**

**Objective:** Verify that ASF can successfully meet MAMM throughput requirements on the Precision Processor.

### **Requirement(s) Under Test:**

- 3.6.2 ASF shall process up to 30 low resolution detected products using the Precision Processor within 48 hours of acquisition at ASF, as requested by the MOC.

### **Inputs:**

- RADARSAT Standard, extended low, or fine beam raw data

### **Outputs:**

- At least 30 Processed SAR image.

### **System(s) Involved:**

- Precision Processor (PP)
- Control Processor (CP)
- EOSDIS Data Gateway (EDG)
- Information Management Subsystem (IMS)
- Production Planning System (PPS)
- Raw Data Scanner (RDS)

### **Actors:**

- ASF Operator(s)
- ASF Production Planner
- Test Personnel

### **Pass Criteria:**

- At least 30 SAR images processed successfully within 48 hours of acquisition

### **Procedures:**

1. ASF test personnel place orders for at least 30 frames of RADARSAT ST1, ST2, ST6, EL1, and FN1 data as soon after acquisition as possible.
2. ASF production planner plans orders.
3. ASF operators follow prompts of operational system to process data.
4. ASF operators perform image quality control.
5. ASF operators instructs IMS to process order to media.
6. ASF test personnel verify that 30 frames were processed within 48 hours of acquisition.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates that ASF has the ability to meet MAMM throughput requirements. It would be best if this was done as a “worst case” test on a single IBM SP2 tower

to verify that ASF can meet this requirement during MAMM if only one tower is available.

## **MAMM-STP-DP-3**

**Objective:** Verify that ASF can successfully meet MAMM throughput and distribution requirements on the Level Zero Processor.

### **Requirement(s) Under Test:**

- 3.6.3 ASF shall process daily, 2 level zero products (not to exceed five minutes per datatake) from the daily acquisitions to Level 0 format using the production Level Zero Processor (LZP) within 48 hours of acquisition at ASF, as requested by the MOC through user services.
- 3.6.3.1 The ASF MOC shall forward copies of selected L0 data to JPL, OSU, and Vexcel via mutually negotiated means.

### **Inputs:**

- RADARSAT Standard, extended low, or fine beam raw data

### **Outputs:**

- Two Level Zero Products

### **System(s) Involved:**

- Information Management Subsystem (IMS)
- Level Zero Processor (LZP)
- Level Zero Controller (LOC)

### **Actors:**

- ASF Operator(s)
- ASF User Services
- Test Personnel

### **Pass Criteria:**

- Two level zero products produced successfully within 48 hours of acquisition.
- Copies of level zero products forwarded to JPL, OSU, and Vexcel

### **Procedures:**

1. ASF test personnel place level zero orders with user services for 2 datatakes of RADARSAT ST1, ST2, ST6, EL1, and FN1 data as soon after acquisition as possible.
2. ASF user services plans orders.
3. ASF operators perform level zero processing to produce data.
4. ASF test personnel verify that 2 level zero products were processed within 48 hours of acquisition.
5. ASF Test Personnel forward copies of the level zero products to JPL, OSU, and Vexcel via the negotiated means.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates that ASF has the ability to meet MAMM throughput requirements on the level zero processor.



## **MAMM-STP-FC-1**

**Objective:** Verify that ASF can provide support for a Mission Operations Center.

### **Requirement(s) Under Test:**

- 3.6.1 ASF shall provide support for two onsite scientists ....

### **Inputs:**

- N/A

### **Outputs:**

- N/A

### **System(s) Involved:**

- N/A

### **Actors:**

- N/A

### **Pass Criteria:**

- ASF provides the following:
  1. One telephone line with long distance access
  2. Table and/or desk space
  3. Chairs
  4. Two Workstations
  5. Software tools

### **Procedures:**

1. Verify that each of the items given in the pass criteria is available for use in the MOC.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates that ASF has planned for the MOC.

## **MAMM-STP-RP-1**

**Objective:** Verify that ASF can provide meet the reporting requirements.

### **Requirement(s) Under Test:**

- 3.4.10 ASF shall produce a final summary of the data not successfully acquired within 30 days of receipt of the last acquisition.
- 3.5.9 ASF shall provide a Mission Operations Plan, to include a staffing Plan, operational procedures, and contingency plans, including emergency use of the 11 meter antenna.

### **Inputs:**

- Mission operations plan input

### **Outputs:**

- Mock-up report of data not acquired.
- Draft Mission operations plan

### **System(s) Involved:**

- N/A

### **Actors:**

- ?

### **Pass Criteria:**

- Dummy report of acquisitions that were not acquired produced.
- Draft Mission Operations plan produced

### **Procedures:**

1. ASF personnel create a dummy report of acquisitions that were not acquired during the acquisition phase of the mission.
2. ASF personnel create a draft of the Mission Operations Plan.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates that ASF has the capability to produce both the report of missed acquisitions and the Mission Operations Plan.

***MAMM-STP-RP-1 SEEMS TO BE A MISLABELING HERE RELATIVE TO THE PREVIOUS ITEM***

**Objective:** Verify that ASF can provide meet the reporting requirements.

**Requirement(s) Under Test:**

- 3.4.1 ASF shall conduct an on-site test mission at least two weeks before the first mission acquisition.
- 3.4.2 ASF shall prepare a test mission acquisition plan, to include at least the following datatakes: an INSAR pair of EL1, INSAR pair of ST1, INSAR pair of ST2, INSAR pair of ST5, three INSAR pairs of ST6, and an INSAR pair of EL1.
- 3.4.5 ASF shall acquire the test mission data.
- 3.4.6 ASF shall process portions of the test datatakes, selected by the science team, to SLC format.
- 3.4.7 ASF shall, as a goal, obtain RADARSAT coverage of the McMurdo transponder at ASF via the TDRSS link.
- 3.4.8 ASF shall provide JPL and Byrd Polar Research Center (BPRC) staff with two copies of the processed test data on DLT.
- 3.4.9 ASF shall prepare a report of the test mission results.
- 3.5.8.4 ASF shall assist in the verification of the McMurdo to JPL communication link (TDRSS channel).
- 3.6.4 ASF shall produce Scan Results Files (SRF) ...
- 3.6.5 ASF shall provide McMurdo DQM files to the MOC.
- 3.6.6 The MOC shall examine 100% of the SRFs produced and compare the results with the planned acquisitions within 24 hours of acquisition.
- 3.6.7 ASF shall provide the products to the MOC.
- 3.6.8 ASF shall provide MAMM data reception reports to CSA and the MOC within 24 hours of data reception.

**Inputs:**

- Mission operations plan input from Science Team

**Outputs:**

- Acquisition plan
- Test Mission Data
- McMurdo DQM Messages
- Scan Results Files
- Data Reception Reports
- Test Mission Results Report

**System(s) Involved:**

- FAIF
- APS
- HC
- Recorders

- 10 Meter antenna
- IMS
- CP
- PP
- Planning tools
- DADS

**Actors:**

- MOC or MOC Analogue
- ASF acquisition planners
- ASF production planner
- ASF operators
- CSA planners
- WFF planners

**Pass Criteria:**

- Acquisition plan produced
- Test Acquisitions successful
- Test Mission data produced
- DQM messages provided to MOC
- SRFs provided to MOC
- Reception reports provided to MOC and CSA
- Test Mission Results Report produced

**Procedures:**

1. ASF mission planners produce acquisition plan based on input from science team.
2. ASF mission planners submit and approve mission plan.
3. CSA sends ASF scheduling files for test mission period.
4. ASF acquisition planner creates WOS files for McMurdo.
5. ASF acquisition planner sends WOS files for McMurdo to WFF.
6. ASF requests TDRSS support for acquisition at McMurdo which contains transponder.
7. ASF acquisition planner creates ASF WOS Files.
8. ASF acquisition planner sends WOS files to HC.
9. ASF operators take test mission passes.
10. ASF operators produce SRFs from test mission passes within 6 hours of acquisition.
11. ASF operators provide SRFs to MOC.
12. ASF system provides reception reports to MOC and CSA.
13. McMurdo provides ASF with DQM messages within 48 hours of acquisition.
14. ASF provides DQM messages to MOC.
15. ASF produces processed SLC test data.
16. Processed SLC test data provided to MOC.
17. At conclusion of test mission, ASF produces test mission results report.

**Criticality of Test:** Mission Critical

**Comments:** This test demonstrates that ASF has the capability to successfully perform the acquisition phase of MAMM.