

# **SAAPS**

## **Satellite Anomaly Analysis and Prediction System**

Test Plan

Version 0.1

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## **Abstract**

This document describes how the functions of SAAPS shall be tested and verified.

# Chapter 1

## Introduction

SAAPS consists of three parts: the database and database tools (DB&T), the satellite anomaly analysis module (SAAM), and the satellite anomaly prediction module (SAPM). The DB&T runs both automatically by updating the database and manually from requests from the SAAM or SAPM. The SAAM and SAPM only runs manually and are connected to a user interface. The testing of SAAPS can thus be divided into two parts: the testing of the automatic background processes and the testing of the user interface.

In the SAAPS Manual [*Wintoft*, 2000b] are described how the DB&T, SAAM, and SAPM are operated. There are also examples of how to perform various operations. To carry out the tests below one should thus first study the manual.

## Chapter 2

# Database routines

The test of the database routines can only be performed on the SAAPS server as these are not accessible from the outside.

### 2.1 Add a new database object

To add a new database object the (system) user must create two Java classes. The classes are created by copying two template classes available on the SAAPS server. The user must then add the necessary information of the database object, such as the name of the object, the data fields, and the field units. The creation of the database object is described in the SAAPS Manual.

After the creation of the Java source code for the new database object the two classes must be compiled.

Finally, the database objects are added to the database by executing the `AddDatabaseObject` command. This step will create the `.data` and `.meta` files in the database.

The new object will automatically appear in any of the tools in SAPM or SAAM.

#### 2.1.1 Test

Carry out the above steps on the `Dummy.java` and `DummyDB.java` files as described in the SAAPS Manual.

Check that the new database object exists by using the `Inspect` program.

### 2.2 Remove a database object

A database object is removed by simply deleting the `.data` and `.meta` files in the database with the UNIX command `rm`. The Java classes need not to be removed.

If there is an automatic update that is still running after the database object that has been removed it will be created automatically again.

### 2.2.1 Test

Remove the `DummyDB.data` and `DummyDB.meta` files and verify that the objects disappear from e.g. the data plotter tool in SAAM.

## 2.3 Inspect and change the metadata

## 2.4 Latest available data

Examine that the latest available data actually exist in the SAAPS database. The data that shall be stored are listed in Table 1 in the database URD [*Wintoft, 2000a*].

### 2.4.1 Test

The test is made with the ASCII export tool on SAAPS. The exported ASCII data are compared with the source data at the corresponding ftp address.

## 2.5 Short interrupts in network communication

Short interrupts in network communication shall not affect the database more than that the latest data will not be available. An interrupt is considered short when it lasts for a time period shorter than the time extent of the original ftp data. This means that when the interrupt has passed the missing data in SAAPS shall be filled with the data available at the source.

### 2.5.1 Test

The test is performed by physically disconnecting the SAAPS server from the network for one hour. During this hour the data in the database shall be examined. This verifies that the server is still running but the latest data are missing. The SAAPS server is reconnected to the network and the database is examined again. The data for the period when SAAPS was disconnected shall now exist in the database.

## 2.6 Long interrupts in network communication

Long interrupts in network communication will affect the SAAPS database. The database will contain datagaps for the time period for which the interrupt lasted. An interrupt is considered long if the interrupt lasts for a time

period that is longer than the time period for which the data at the source extends over.

### **2.6.1 Test**

This test is carried out by physically disconnecting the SAAPS server from the network for four hours. This will affect the ACE and GOES data as the data sources only contain the latest two hours of data. After SAAPS has been reconnected with the network the database shall be examined. The data will show a two hour long period for which the data fields are set to NaNs.

## **2.7 Data gaps in source data**

Ocasionally there will be data gaps in the source data from the ftp site. The description of the data gaps varies from the different sources. In the SAAPS database the gaps shall always be described with NaNs (Not a Number). Sometimes the last data in the source contain a data gap while a few minutes later this gap has been replaced by a value.

### **2.7.1 Test**

The propagation of the data gaps are tested by searching the data source for periods with data gaps, and exploring the data in the SAAPS database for the same period.



## Chapter 3

# Test of user interface

There are two aspects of the testing of the user interface. Firstly, there is the test of the expected behaviour of the tool when the user proceeds along the right steps. Secondly, there is the test of when the user misses some essential step and tries to proceed. The different tools usually contain several items that need to be specified by the user to be able to produce expected action. If the items in the interface have not been correctly set the user shall be notified.

### 3.1 Data plotter

If the user pushes the Get Data button before selecting any database object a dialog shall notify him.

When the Get Data button is pushed and there are no data for the selected database object, for the given start and end dates, the user shall be notified.

When the Plot button is pushed and the data fields to plot has not been selected the user shall be notified.

#### 3.1.1 Test

Go through the database object list, one at a time, and produce a plot for the current day.

### 3.2 Superposed epoch analysis tool

Clear the event window list and push Generate random list. The user shall be notified that no events have been specified.

### 3.3 Anomaly prediction tool

## 3.4 Help pages

### References

Wintoft, P., *Satellite Anomaly Analysis and Prediction System SAAPS WP 110 Database and Database Tool User Requirements Document, Version 1.1*, ESA/ESTEC Contract 11974/96/NL/JG(SC), April 2000.

Wintoft, P., *Satellite Anomaly Analysis and Prediction System SAAPS Manual*, In preparation, 2000.

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