

Consultatif Committee for Time and Frequency

Seventeenth Session

(Sèvres, 14 and 15 September 2006)

Report of the NMi VSL TF section

NMi Van Swinden Laboratorium

April 2004 - September 2006

Introduction

In the period 2004-2006 the main activity was the movement to the new laboratory in March 2005. Other activities were mainly in the fields Two-Way Satellite Time and Frequency Transfer (TWSTFT), GPS and Glonass time transfer. Research on the SATSIM station delay calibrator was also continued.

The responsible person for Time and Frequency for the last decades, Gerrit de Jong, retired in December 2005. Gerrit's work will be continued by Erik Dierikx and Erik Kroon.

Movement to the new laboratory

In March 2005, NMi Van Swinden Laboratorium moved to its new location:

Thijsseweg 11
NL-2629 JA, DELFT
The NETHERLANDS

During the movement, the 4 Cs clocks were kept running on batteries. The clocks were moved one by one. The new TF laboratory is a screened room, in which the temperature is controlled within 0.1 °C and relative humidity is controlled within 5 %. It has been demonstrated that the uncertainty in the UTC(VSL) has not been affected by the movement of the clocks.

Clocks

At NMi VSL the UTC(VSL) time scale is based on 4 commercial high performance caesium clocks. During the years 2004-2006 most of the Cs clocks were performing well. At the end of 2005, in one of the clocks the Cs tube had to be replaced.

TWSTFT

For the TWSTFT system two new 2.4 m antennas were purchased and installed on the new VSL building.

A new improved SATSIM has been developed and installed. The first results showed a stability within 0.5 ns over at least one week.

The indoor up- and down converters have been replaced, as well as the LNA and the SSPA. The cables used in the TWSTFT system are phase-stabilized cables.

In November 2005 the NMi VSL TWSTFT system has been calibrated using the TUG portable TWSTFT system. The results were very satisfactory and have been applied in the system.

GPS

At NMI VSL, facilities are available for GPS CV and GPS multi-channel, and recently a geodetic receiver has been installed providing GPS P3 data.

In November 2005 NMI VSL attempted to participate in the GPS calibration campaign, but unfortunately, the hard-disk of the visiting GPS receiver system failed, so the measurement data was lost.

An advantage of moving to the new building is that our GPS antennas are now located at a geodetic fixed reference point which is also used for IGS measurements.

GLONASS

The GLONASS R100-40T receiver is still being used at NMI VSL. The new geodetic receiver also provides GLONASS data in RINEX format.