

**Real Time Pilot Project**  
**Minutes of Teleconference**  
**Analysis Centre Coordination**  
**3 May 2008**

## **1 Meeting Summary**

This teleconference was held on 18 April 2008 and was hosted by NRCan.

Participants were:

ESOC: Loukis Agrotis, Carlos Garcia-Martinez, Pedro Alfaro, Javier Tegedor  
NRCan: Mark Caissy, Ken MacLeod  
BKG: Georg Weber  
TU Catalonia: Manuel Hernandez-Pajares  
GMV: Álvaro Mozo García  
LM Sweden: Gunnar Hedling

The following could not participate on the day and a separate teleconference will be organised to introduce them to the project:

NCL Philip Moore  
KASI Jung Hyun Jo, James Park  
Chalmers Jan Johansson

The following was the meeting agenda:

- 1) PP Status (M Caissy)
- 2) Analysis Centre Status and Plans for Participation (all)
- 3) Data Dissemination Policies and Procedures (G Weber, M Caissy)
- 4) Product Dissemination for Comparisons and Combination Solutions (L Agrotis)
- 5) Real Time Product Generation
- 6) AOB
- 7) Subsequent Discussions

## **2 PP Status**

Mark outlined the status and objectives of the PP. He mentioned that he has obtained the IGS Governing Board approvals for the submitted proposals and, after some delays due to unforeseen circumstances, it is now time to start the work.

The IGS workshop priorities for the PP session were highlighted as:

- Management Aspects
- Data Centres
- Real Time Formats
- Product Generation
- Other Activities (e.g. RTK)

A 30-minute discussion session at the workshop will be devoted to two topics, one of which will be the Data Format discussion.

Mark mentioned that a number of new proposals for participation have been received but have not yet been reviewed by the committee.

As a matter of priority, NRCan are working on updating the PP web site, including the addition of information on NTRIP and on the PP structure.

### **3 Analysis Centre Status and Plans for Participation**

The Analysis Centre representatives presented their infrastructure, their current and planned capabilities and plans for PP participation. These are summarised in the Analysis Centre Datasheet, which was disseminated separately to all Analysis Centre representatives for completion (see separate attachment).

In addition, the following discussion points were raised:

Gunnar mentioned that he was representing the Swedish effort since Jan Johanson could not participate.

Ken said that the NRCan ionospheric product is not made available due to the lack of density in the network. Manuel agreed and stated that they have initiated an activity to see what can be achieved and to propose an evolution of the network. Georg said that there is already good coverage for the ionospheric coverage in Europe. It is understood by Georg that the usage of the Real-time IGS network also comprises support of RTK networks for referencing them to ITRF. Another application in view is the real-time estimation and dissemination of troposphere corrections.

It was agreed that data from all RT stations should also be available as RINEX files at the Data Centres. What needs to be discussed is whether or not this should include 15min high-rate files converted from streams. It is understood that this would increase the total volume of RINEX data to be archived by Data Centres up to a factor of 10.

Georg raised the issue of what to do with stations that are currently:

- either not in the official IGS network, or
- only have the status of a proposed IGS station, or
- are neither an IGS nor a proposed IGS station.

It was agreed that these stations should be free to contribute but it may not be possible for the Analysis Centres to process all the data. Stations in remote locations should be encouraged to participate, as the RT products suffer from the uneven network distribution. It is understood as important that all these stations are included in a regular IGS post-processing procedure, as having precise coordinates and velocities available for them is a precondition for including the streams in any real-time analysis.

It was also noted that the provision of RT ionospheric products (DCB, TEC) could be a benefit and motivation for station operators.

### **4 Data Dissemination Policies and Procedures**

The Real Time Data Centre representatives presented their infrastructure, their current and planned capabilities and plans for PP participation. These are summarised in the Data Centre Datasheet (see separate attachment).

Further points to note are:

Ken said that by this summer, NRCan will have developed the RT-IGS standard for a more generic GNSS data message type. Later they will be working towards a generic product message type. The NRCan opinion is that RTCM is not necessarily the best

way forward for internal data transfers but it could be the solution for product dissemination to users.

Georg stated that new RTCMv3 messages are under development

- for orbit and clock corrections to broadcast ephemeris
- for transport all possible observation types from any GNSS

Furthermore, an NTRIP v2 is under development. It is planned that this will also offer UDP, in addition to the TCP capability.

## **5 Product Dissemination for Comparisons and Combination Solutions**

Loukis presented a proposed plan for RT analysis centre comparisons and for the generation of a combination product. The intention is to initially make comparisons based on submissions of clock RINEX and SP3 files from the Analysis Centres. These could be referred to the IGS rapid product and would therefore require the submissions of daily files. Since these comparisons can use existing standard tools, they can be implemented in a short time period.

Subsequently, it should be possible to receive and decode the Real Time product stream from each Analysis Centre. However, to ensure reliability, it is better to also retain the RINEX/SP3 comparisons.

A combination product can be produced using frequent batch file submissions. However, we have to consider that if there is an intention to provide a (very near) real time combination product, it may be better to provide a streaming combination product based on the Analysis Centre product streams. ESOC resources can only be steered into one out of these two possible directions, and the first proposal is to go for a streaming combination solution. Clearly, this area needs further discussion and agreement by all contributors.

## **6 Real Time Product Generation**

The discussion was mainly on formats. RTCM may be the way forward but a discussion is needed within the IGS before making a decision.

## **7 AOB**

It was agreed that Mark will approach the Data Centres to request that a repository be established for the archiving of the Real Time products using standard formats (AI raised).

Mark and Loukis thanked the participants for their contribution.

## **8 Subsequent Discussions**

Subsequent discussions were held with Jan Johansson (Chalmers), Leos Mervart (TU Prague), Philip Moore (University of Newcastle) and Jung Hyun Jo (KASI). All parties expressed their commitment to participate in the Pilot Project. This is reflected in the updated Analysis Centre datasheet

**9 Action Item List<sup>1</sup>**

Action Item	Status	Submit Date	Due/Close Date	Title	Description	Actionee	Response
M1-1	Open	18/04/08		Archive of RT Products	Request the IGS Data Centres to host repositories for the Real Time products and Analysis Centre comparisons and investigate the possibility for storing the 15 minute high rate data files.	Mark Caissy	

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<sup>1</sup> Greyed-out entries have been confirmed as closed