NORDISKA KOMMISSIONEN FÖR GEODESI

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The NKG Steering Committee on the on-going sub-projects for "NORDIC POSITIONING SERVICE"

Minutes of the 16th meeting

Gävle, Sweden - November 10-11, 2003

PRESENT

Denmark: Sigvard Stampe Villadsen
Bo Madsen
Finland: No representative
Norway: Bjørn Engen
Rune Hanssen
Sweden: Bo Jonsson
Andreas Engfeldt(secretary)

ITEM 1: OPENING OF THE MEETING

Bjørn Engen welcomed everybody to the 16th meeting of the NKG Steering Committee on the on-going sub projects for "Nordic Positioning Service".

The Steering Committee agreed to the following agenda for the meeting

1. Opening
2. Minutes from the 15th Steering Committee meeting on 3 June in København and review of the action list
3. Situation for the institutions
4. Task from the Presidium

5. Report from the latest Directors General Meeting
6. Current status, national Network RTK, results of performed tests, GPRS
7. Activities before 1 July 2004 Computer network B – Real time service with dm accuracy
8. Activities after 1 July 2004
   A0 – Station database and Standard for reference stations
   A1 – Web (post-processing data)
   C1B – Real time service with cm accuracy and evaluation of RTK algorithms
   A2 – Automated Computation Service
   C1A – Distribution channel for RTK
9. Plan to complete the project
10. Future work
11. Other items
12. Next meeting and closing

ACTION LIST:

- Three documents should be written for the Presidium and finished latest the 3rd of May 2004: Status plan, financial plan, future visions (ITEM 4). Stampe will start the writing on the Status plan.
- The Javad format to be used should be defined (before 1/12-2003) (ITEM 7). Statens Kartverk are responsible together with Lantmäteriverket.
- A Javad-Ribex converter should be developed by Statens Kartverk (before 1/4-2004) (ITEM 7).
- All data for the Nordic dm service will be sent to Hønefoss and the software will be run from there. This should be finished in the end of November (ITEM 7, B).
- DPOS (Network-DGPS) should be working in Denmark as soon as possible. Rune will take the initiative for a telephone meeting between KMS and SK (ITEM 7, B).
- Andreas will send a coordinate list of the Swedish stations to Rune (ITEM 7, B).

- Until next meeting every country will classify at least two types of reference stations in their own country (ITEM 8, A0).

ITEM 2: MINUTES FROM PREVIOUS MEETING Minutes from the 15th Steering Committee meeting on June 3, was approved after the following remarks were given: **REVIEW OF THE ACTION LIST FROM THE MEETING OF THE STEERING COMMITTEE ON JUNE 3 AND WHAT HAS HAPPENED:**

- Resources will be allocated to solve the computer network problems between Norway and Sweden. This will be done before the summer holidays. Action carried out: Data from three Swedish stations are now sent to Norway (ITEM 7).
- A new project group will be formed for sub-project A0. They will have their first Meeting on the 2-3 of September, probably in Hønefoss. Action carried out: A Meeting took place in Norway (ITEM 8, A0).
- Before the meeting of the new A0 project group, every country have to classify two different types of reference stations. Action carried out: None (ITEM 8, A0).
- A new web-project group will be formed. They will have their first Meeting on the 4th of September at Gardermoen. Action carried out: The meeting was cancelled (ITEM 8, A1).
- In August and September a two months test with SAPOS and DARC will be performed in one of the Network RTK areas in Sweden. Action carried out: The tests are delayed (ITEM 8, C1A).
- Bo Jonsson will check how Network RTK works in Switzerland and Andreas Engfeldt will check how the SAPOS network is working. This will be checked before the next meeting. Action carried out: Bo met Andreas Wiegert in Japan in June and got some information from him. There are just a few users in the gouvernmental network, but in spite of that the user fees were also about to increase. There is also a private network in Switzerland, but Bo didn't get any information about number of the users in that network. Andreas Engfeldt informed about the

German SAPOS network. Their service HEPS is their centimeter solution and the subscription cost is 250 Euro/year + 0,10 Euro/minute.

- The Danish height test is planned to be performed in June (two weeks after this meeting). Action carried out: It was performed then and the results are reported in ITEM 6 here.
- When all data problems with the computer network and data formats for real-time raw data have been solved, KMS will perform a DPOS-test . Action carried out: There are still some data problems with the computer network (ITEM 7).
- LMV will present statistics for the SWEPOS Automated Computation Service on the next meeting of the Steering Committee. Action carried out: Bo presented the statistics on this Meeting (ITEM 8, A2).

ITEM 3: SITUATIONS FOR THE INSTITUTIONS

KMS: A new Director General has recently been installed. According to him will no more big things in the organisation happen within the next two years. LM: This week Joakim Ollén will resign as Directors General. No successor has been found yet. All investments must be approved by the Directors General since the beginning of June SK: There will be 30% reduction of funds next year, which could mean that one of the main tasks for Geodesy could be stopped. The Wednesday after this meeting a meeting about this will take place at the Environment Ministry. The mapping work at sea has the highest priority until 2006, which means that the production of county maps will be reduced. 18 offices in the Counties will be reduced to 12.

ITEM 4: TASK FROM THE PRESIDIUM

Bjørn/Bo informed that we must develop a vision for the project. Three documents should be written for the Presidium and finished latest on the 3rd of May 2004:

- Status report (Stampe starts with the writing)

- Financial plan
- Future visions

ITEM 5: REPORT FROM THE LATEST DIRECTOR GENERALS MEETING

Bjørn reported about the latest Directors General Meeting on 25-26 August in Iceland. Nothing in particular happened and quite shortly after the Meeting it was announced that Peter Jacobsen should resign, the same thing as Joakim Ollén had announced a few months before the Meeting.

ITEM 6: CURRENT STATUS

Tests:

Stampe reported about the Danish Height test. Three GPS antennas of different brands were used together with the same GSM-connection. Totally four antennas were tested: Javad, Leica 530, Trimble 4700 and Trimble 5800. The deviation for the antennas without groundplane (Leica 530 and Trimble 5800) had a bigger amplitude = bigger differences between the values. The average deviation from the known height value was 0 mm for Trimble 4700; 3 mm for Leica; and 7 mm for Javad and Trimble 5800.

Map of Nordic reference stations:

Quite many different versions of maps of the Nordic permanent reference stations have now been developed.

GPRS:

Bo informed that Network RTK probably contains too big amount of data to gain the using of GPRS as distribution channel. At LMV a diploma work is at present being performed, where GPRS and Internet are tested as distribution channels for GPS.

ITEM 7: ACTIVITIES BEFORE 1 JULY 2004 THE COMPUTER NETWORK

The computer network between SATREF, SWEPOS and the Danish network

is working. Exchange of data between SATREF and the Danish network of permanent reference stations is in operation. The software development for exchange of data between SWEPOS and SATREF/the Danish network is still not finalised. The Swedish server, IMOS, which works as the controller of the stations (by alarms etc), only accepts Ashtech- and Javad-formats. This is a problem that must be solved, because the data from Norway is not in Ashtech- or Javad-formats.

The goals are to:

- Make data available from all Nordic stations in real-time in the pre-defined formats to all respective institutions. KMS, LMV and SK are responsible.
- Define Javad format to be used (before 1/12-2003). LMV and SK are responsible.
- Develop a Javad-Ribex converter (before 1/4-2004). SK is responsible.

B - A Nordic Real-time Service with half-meter horizontal accuracy (95 %)

It was decided that this sub project should get the highest priority. In the DPOS network for Sweden and Denmark the following stations will be included:

- Mårtsbo, Karlstad, Visby, Jönköping, Onsala, Norrköping, Skillinge, Leksand, Buddinge, Smidstrup, Suldrup, Oslo, Kristiansand, Stavanger, Dagali och Trysil.

In the DPOS network for Norway the following Swedish stations will be added:

- Kiruna, Arjeplog, Vilhelmina, Östersund and Sveg.

It is still not decided if we will use one solution for the whole area or two solutions, one for Norway and one for Sweden and Denmark. During December we must check how everything is working. In January we will have a working group meeting.

All GPS-data for the Nordic DPOS-service will be sent to Hønefoss. The software will then be run from there. This will be finished in the end of November. Today data from three Swedish stations are sent to Norway

(Hässleholm, Onsala and Vänersborg). Andreas will mail a coordinate list of the Swedish stations to Rune.

Still the Javad format is a problem (see ITEM 7, Computer Network). Of the stations mentioned above, Jönköping, Kiruna, Mårtsbo, Onsala and Visby are equipped with Javad receivers as main receivers. In a few months time also Vilhelmina will use a Javad receiver as main receiver.

The first thing to do is to make DPOS work in Denmark as soon as possible. Rune will take the initiative for a telephone meeting.

The goals are to:

- Make DPOS corrections available for national distribution in each country based on data from Nordic base stations and based on a common Nordic communication network (more or less ready).
- Testing of DPOS in Denmark by means of a monitor station at KMS (15/11-2003).
- Testing distribution in Denmark on DAB.
- Improve DPOS in North Norway.
- Provide a DPOS prototype service in Southern Sweden.
- Provide a DPOS service in Skagerrak.
- Provide a DPOS prototype service in Northern Sweden.

ITEM 8. ACTIVITIES AFTER 1 JULY 2004

PROJECT A0 - A Nordic standard for reference stations

The document of the classification of the reference stations that has been developed is at last written, see Appendix A. This document will have to be revised every second year. Bo Madsen accepted to be responsible for that. Andreas will distribute the document together with the minutes of the 15th meeting of the Steering Committee.

Until the next meeting of the Steering committee each country will classify at least two types of reference stations in their own country.

The goals are to:

- Ensure that the permanent GPS stations in the Nordic countries have the required quality with regards to their use. This shall be achieved through a classification system for each usage area.
- Test classification of existing stations and evaluation of the standards.
- Relate the standard to the different major requirements.

Database for station information

A project group, who will make all arrangements for the database, has been formed. A working group meeting was held on the 2-3 of September in Hønefoss. Nothing was decided at the meeting. Rune had a proposal, but there were no comments on it from the other participants. We decided to put the database sub project in a mothproof bag for a while.

PROJECT A1 - A Nordic Web-site for download of reference station data for post-processing purposes

KMS will co-ordinate and start the development of a login page for the Nordic Web-site portal for post-processing data. In this matter a lot of different ideas (not mentioned here) how the Web-site should work were discussed. It was decided that we will have only one start page for the download of post processing data and from that page the users should be directed to the national page after they have marked which system they are registered users of (SATREF/SWEPOS/the Danish network).

The computer is in Denmark. Norway can solve the matter on their own behalf. The problem for Sweden is the Unix-environment. It will take a while before Sweden can show the portal.

The goals are to:

- Starting a new Nordic Web portal in Norway. KMS and LMV shall provide the necessary daily data for post processing.

C1B - Evaluation of available RTK algorithms

Nothing in particular was mentioned here.

PROJECT A2 - An Automated Computation Service
Statistics from the LMV Automated Computation Service was shown. During this year (2003), 1600 different jobs (point positions) from people outside the Geodetic Research Division, has been calculated. Totally these jobs have been calculated for about 100 different users.

The goals are to:

- Pending. A Nordic solution in 2004.

The 10-12 of June the NKG Working Group for Reference Frame and Positioning had a meeting in Gävle where the plan for a 3-D GPS campaign was developed. The campaign was meant to investigate the relations between the national reference systems in the Nordic countries. Now when this is done the computation service can be extended to be a Nordic service and introduced e.g. in Denmark.

PROJECT C1A - Test of distribution channels for RTK Two municipalities in the western Network RTK area of Sweden are just about to start a test with the SAPOS RTCM-message 59 for network-RTK. Then the DARC channel on the FM-radio network will be used as the distribution channel (locally). As mentioned in ITEM 6, a diploma work is being performed at LM, which tests GPRS and Internet as the distribution channel.

STATUS FOR THE CPOS-SERVICE IN NORWAY, THE COMMERCIAL SERVICES IN DENMARK AND THE REGIONAL POSITIONING SERVICES IN SWEDEN

Goals for a RT service with cm accuracy:

- Guidelines for optimal Network RTK/single station RTK use concerning reliability and efficiency. Per Erik Opseth will distribute a draft of the guidelines to the steering Committee.

- Exploit Nordic stations for an optimal distribution of base stations with regards to national services.

The new Danish permanent reference station, Gedser, is now built. The monument for the future station in Hirtshals will be built in December. Esbjerg is another place where a permanent reference station is planned. The coordinates of Smidstrup were changed 2-3 mm in plane and 6 mm in height when the GPS antenna was switched to another GPS antenna of the same type.

CPOS have now two types of users; one type thinks the service is "great" and the other type thinks it is not good enough for them. In May/June 2004 there will be a workshop about "CPOS". There will also be another workshop in January, about "Guidelines for Network RTK and Single station RTK".

In Sweden the three Network-RTK projects will turn into a Network RTK-service on 1/1 2004.

ITEM 9: PLAN TO COMPLETE THE PROJECT
See ITEM 4.

ITEM 10: FUTURE WORK EGNOS will be a new point on the agenda for next meeting.

ITEM 11: OTHER ITEMS
Nothing in particular was mentioned here.

ITEM 12: NEXT MEETING AND CLOSING
The next meeting of the Steering Committee will take place in Hønefoss on February 26, 2003, 12.00 – February 27, 2003, 12.00. Bjørn thanked all the participants for their contribution to a fruitful meeting.