UPGRADE TO GALILEO IN RTK NETWORKS

GALILEO USER CONSULTATION PLATFORM, DECEMBER 1ST 2020

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SWEPOS®

- A national network of permanent reference stations and a part of the national geodetic infrastructure
- The investment is covered mainly by governmental funds
- The operation costs including future upgrades are covered by user fees
- Established in cooperation with Onsala Space Observatory/Chalmers
SWEPOS - A NATIONAL CORS-NETWORK

- 68 class A and 404 class B stations
- 24/7 service with support 06.30-20.30 weekdays (Friday until 18.00). On-duty call all other time on a weekly schedule
- Trimble NetR9 and Alloy receivers, Septentrio PolaRx5
- During the years continuously upgraded and developed to meet the needs from the user community.
- In 2016 the network was already prepared for Galileo
- Redundant datacenter in operation 2020
SWEPOS NETWORKS-RTK-SERVICE

6300 licenced users, 7500 in total
+ 85 000 hours of connection time/week

Main users;
Construction 35%
Surveyors 17%
Agriculture 16%
Municipalities 13%

The use of the service since 2004. Orange – number of users, blue – connection time/week
THE IMPLEMENTATION OF GALILEO IN SWEPOS

Since 2016 several Galileo tests has been carried out for the implementation of Galileo in SWEPOS network-RTK –service

- In spring of 2016 RTK tests with GPS and Galileo towards a physical SWEPOS station
- By the end of 2016 some more test measurements with VRS technology were carried out
- During the spring of 2017 in more difficult environments and high elevation cut off angles
- In October 2018 some more tests in forest
- In March 2019 a study was made with data from a monitoring station.
THE IMPLEMENTATION OF GALILEO IN SWEPOS

Summary;

• Test measurements show improved availability when adding the Galileo satellites
• More fixed solutions and shorter time to initialisation, especially at 25–35 degree elevation cut-off angle

In February 2018 support for Galileo was added in SWEPOS network RTK service.

Approximately 30% of the users connect to RTCM MSM data-streams with Galileo corrections, almost all new subscribing users use RTCM MSM
USE OF GALILEO FOR THE STAKEOUT OF THE NATIONAL BORDER BETWEEN SWEDEN AND NORWAY

Users of SWEPOS network RTK have also reported of increased availability when Galileo satellites have contributed to their measurements.

Galileo is used in the ongoing review of the national boundary between Sweden and Norway.

Has made it possible to work in denser vegetation than expected.
USE OF GALILEO IN INFRASTRUCTURE-PROJECT

Concept for the use of Network-RTK in large scale infrastructure projects.

During 2019 it was established for project "Norrbotniabanan", for the first stage between Umeå and Skellefteå.
USE OF GALILEO IN INFRASTRUCTURE-PROJECT "NORRBOTNIABANAN"

Project consist of 133 km railway and also new roads, bridges etc.

15 new SWEPOS stations established

Estimated savings by the use of Network-RTK and GNSS is 650 million SEK (~65 million EUR) compared to traditional technology, surveying and machine guidance.

Galileo is mandatory for all contractors in the project!
Thank you for your attention