EUPOS®
European Position Determination System

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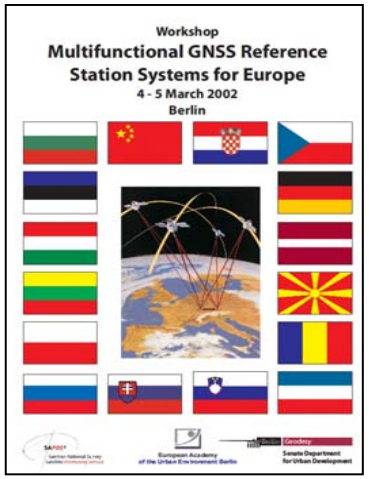
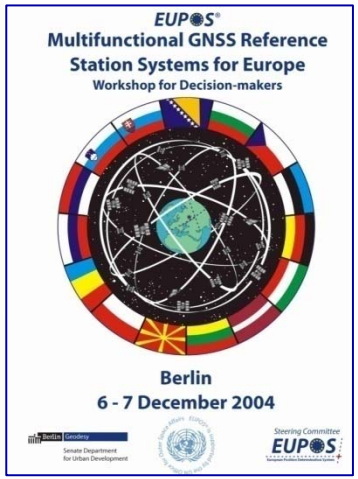
The *EUPOS* initiative

A project was initiated by the Berlin Senate Department for Urban development and supported by the European Academy of Urban Environment (EA.UE) in Berlin, Germany, 4th-5th March 2002.

A Steering Committee was elected at the conference in Berlin on 4th and 5th March 2002, to draw up the draft proposal of the European GNSS reference network to be established in the near future.





The *EUPOS* initiative

EUPOS is a European regional ground-based GNSS augmentation system and an international organisation as well,

EUPOS provides in Central and Eastern Europe and in several Eurasian countries a network of multi-functional DGNSS reference station systems providing signals that could be used for both geodetic point positioning and land, marine and air navigation. It's a border less transition to the Asian-Pacific initiative Multi GNSS ASIA (MGA)

EUPOS fulfils all accuracy requirements of geodesy and navigation – centimetre and sub-centimetre in post-processing, and centimetre as well as metre in all real-time modes.

The *EUPOS* initiative

EUPOS guarantees availability, quality and a service continuity due the use of uniform technical standards in 22 countries.

EUPOS membership is admitted on a voluntary basis.

EUPOS is the densest coordinated strategic ground based GNSS infrastructure worldwide

EUPOS is a multi GNSS infrastructure providing services and promoting service based applications

EUPOS ® characteristic

Uniform multifunctional DGNSS reference station systems and services are going to be build up in all EUPOS participating countries

EUPOS is an common realization of high density reference station networks (single segments)

Common terms of reference and standards for building up and managing the GNSS infrastructure

High redundancy based on additional stations (65-70 km) and used signals L1,L2,L5 for GPS,GLONASS,GALILEO ….

ICG and SC-104 Differential GNSS Standardization

Achieving compatibility and interoperability among global and regional space-based augmentation systems guaranties the trans border worldwide use of positioning and navigation services of GBAS

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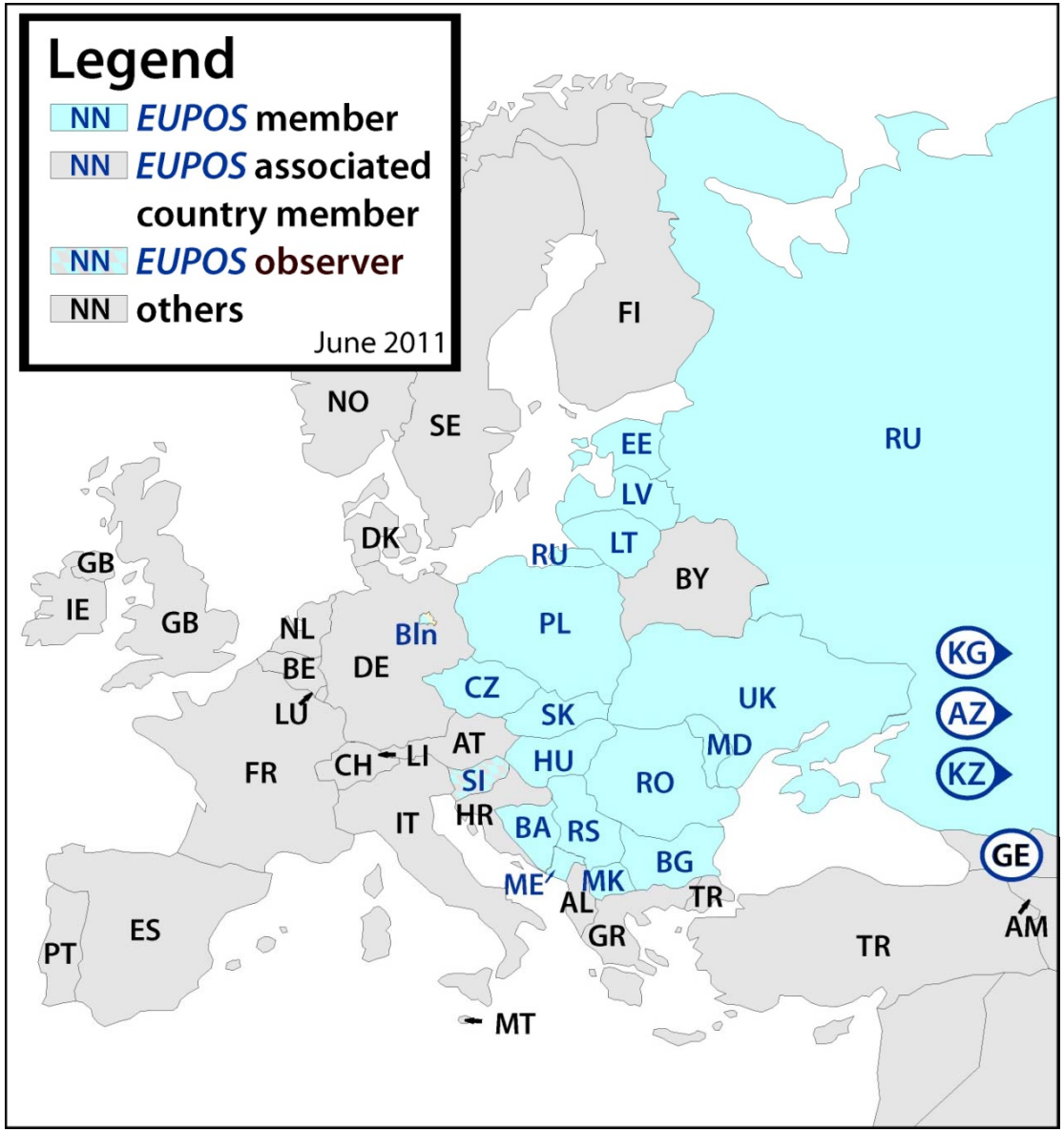


EUPOS members

Bosnia and Herzegovina
Bulgaria
Czech Republic
German state Berlin (ISCO)
Montenegro
Estonia
Hungary
Kazakhstan
Latvia + Riga
Lithuania
Republic of Macedonia
Moldova
Poland
Romania
Russian Federation
Serbia
Slovak Republic
Ukraine
Slovenia (observer)

Azerbaijan, Kyrgyzstan and Georgia are *EUPOS* associated country's

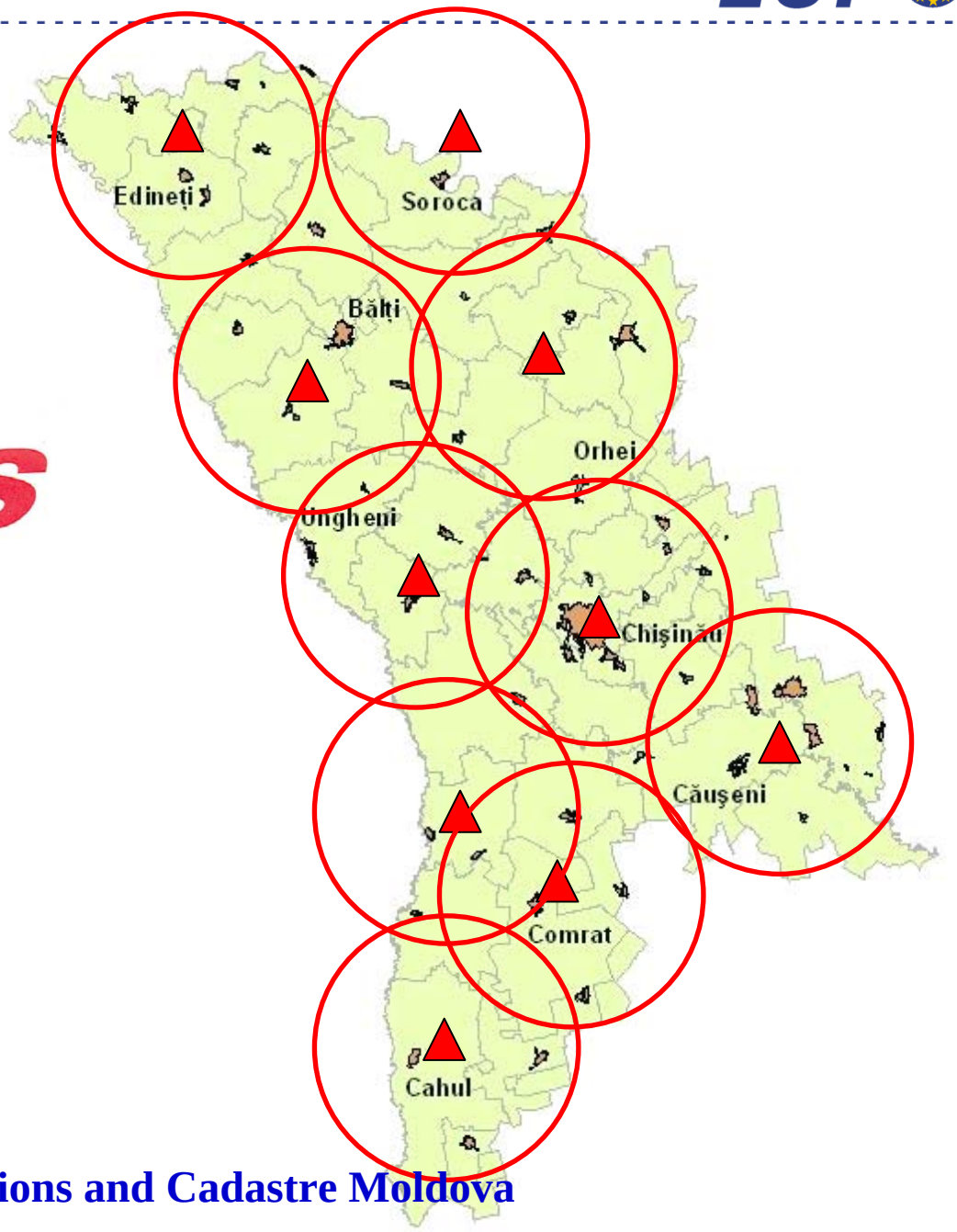
As at 1st June 2011

EUPOS Country (ISO 3166)	Area [km²]	planned RS	realised RS	*EUPOS* Country (ISO 3166)	Areal [km²]	planned RS	realised RS
BA	51,000	26	1	MK	25,434	14	14
BG	110,950	36	36	MD	33,700	15	10
CZ	78,870	27	27	PL	323,520	99	99
DE/ Berlin	891	4	4	RO	237,500	73	58
EE	45,220	17	9	RU	17,075,400	238+	224
HU	93,030	36	35	RS	88,360	32	32
KZ	2,724,	500	30	SL	20,270	15	15

As at 1st June 2011

EUPOS Country (ISO 3166)	Area [km²]	planned RS	realised RS	*EUPOS* Country (ISO 3166)	Areal [km²]	planned RS	realised RS
LV	64,600	23	23	**SK**	46,035	25	23
LV/ Riga	307	5	5	**UA**	603,700	30	8

Configuration MOLDPOS network (10 stations) started November 2011



Locations for permanent stations:
1. Edineț
2. Făleşti
3. Sărăteni Vechi
4. Soroca
5. Căuşeni
6. Comrat
7. Cahul
8. Nisporeni
9. Leovo
10. Chişinau

***sourece: Agency for Land Relations and Cadastre Moldova**

EUPOS
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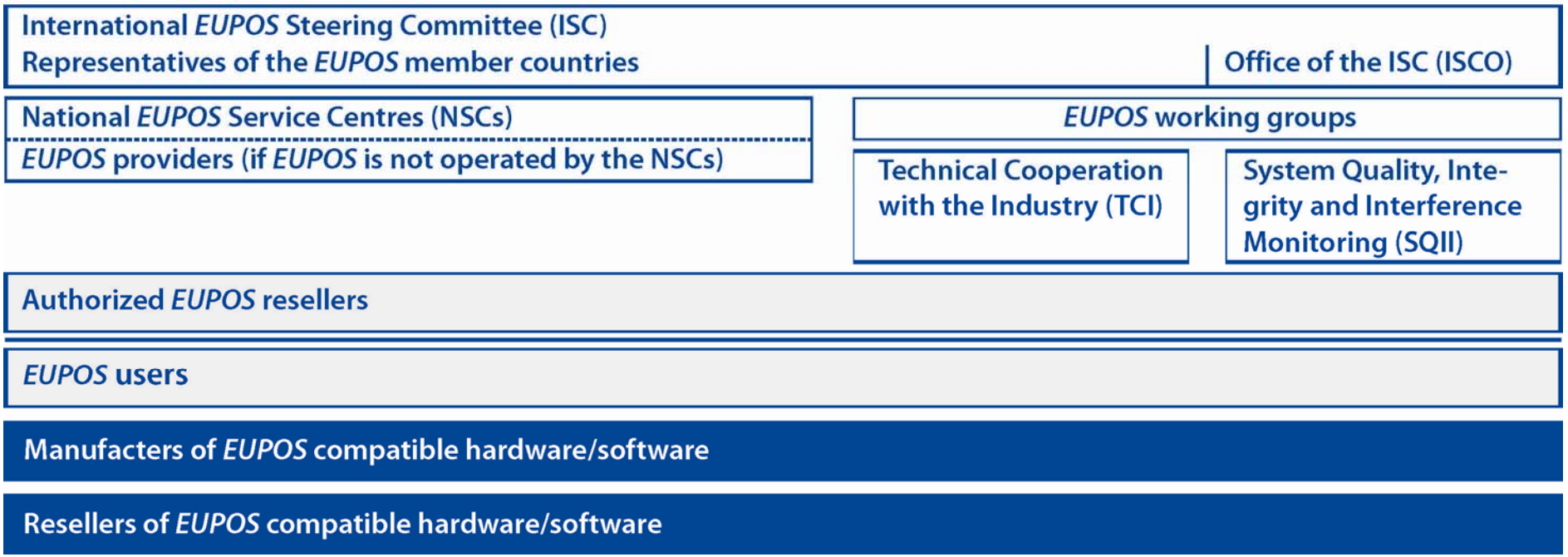
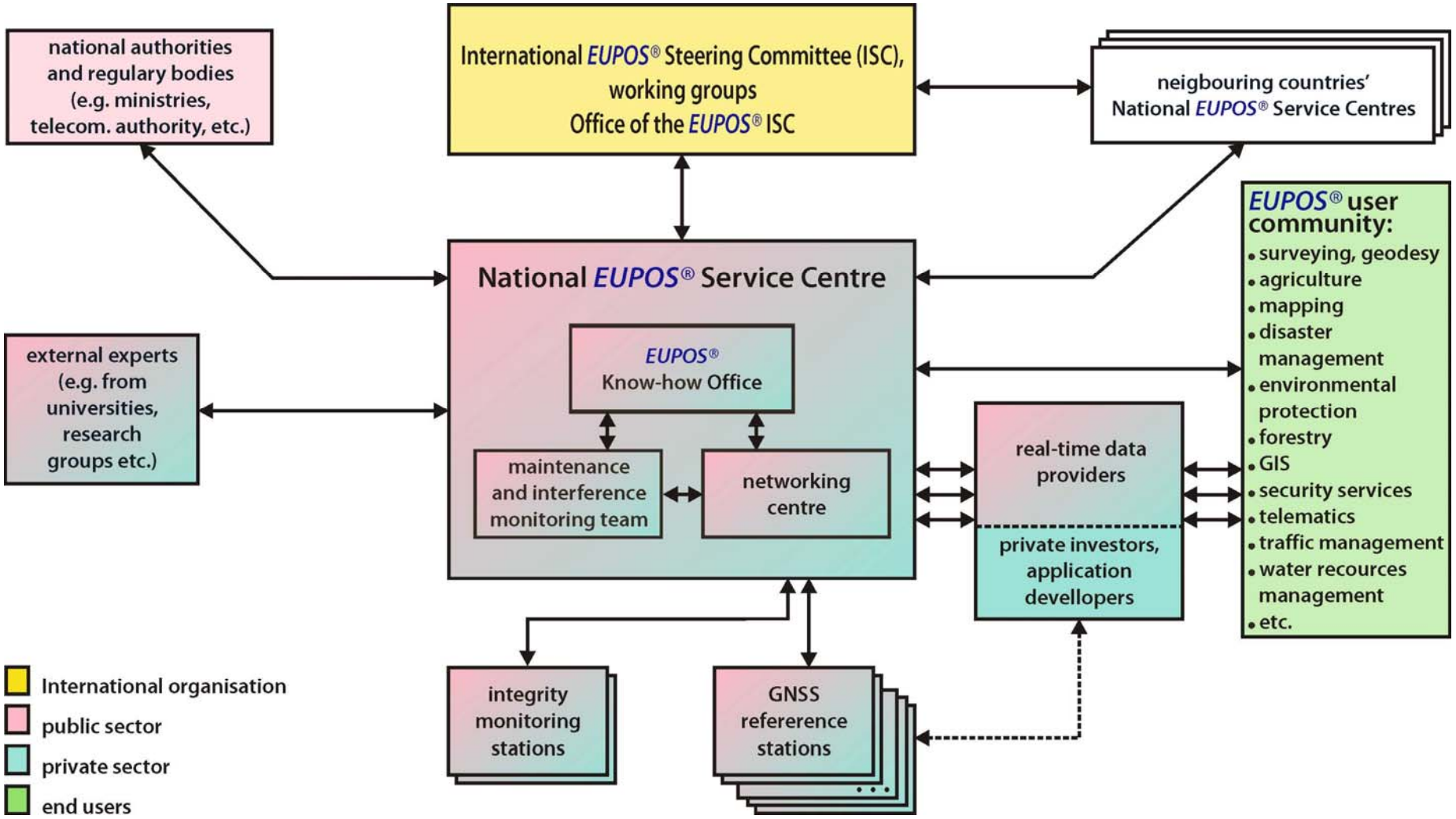
The organisational structure of *EUPOS*



EUPOS National Service Centres structure



Changes of the *EUPOS* Terms of Reference (excerpt of §5)

Members of the ISC are:

(a) One representative from each *EUPOS* member country. In exceptional cases a country may be granted more than one representative should this be advisable due to that country's particular situation. They shall, nevertheless, hold a common position in the ISC decision-making process;

(b) Representatives of other states, organizations, institutions, companies etc. which joined the ISC at its founding;

(c) The head of the ISC Office (ISCO);

New

(d) Non-European countries can apply for the status "associated country", which allows participation in all *EUPOS* conferences and activities. However countries which have associated country status can not vote in the *EUPOS* decision making. Associated countries receive full membership if the DGNSS infrastructure will be established and fulfill the *EUPOS* Standards.

Current technical matters

To continue the development of DGNSS ground-based augmentation systems in the *EUPOS* countries with regard to the *EUPOS* standards and guidelines.

To ensure that all antennas of the *EUPOS* reference stations are calibrated in consideration of absolute antenna Phase Center Variations (PCV).

To reach RTCM SC 104 Standard of encrypted data messages (Private Messages).

To develop a *EUPOS* self-certification procedure corresponding with the *EUPOS* technical standards.

To revise *EUPOS* technical standards (DOMES nomenclature, sitelog submission to ESDB) and *EUPOS* reference frame fixing guidelines.

EUPOS co-operations and memberships

EUPOS contributes to UNOOSA activities and goals in the field of DGNSS and applications, e.g. by *EUPOS* participation in UNOOSA workshops.

EUPOS is an associated member of the International Committee on GNSS (ICG), and a founding member of the ICG since 2004.

EGNOS and *EUPOS* have agreed on the goal of entering into a co-operation for their reciprocal benefit. A first meeting was held in Berlin on 23rd March 2011.

EUPOS co-operations and memberships

EGNOS is laced with some limitations regarding coverage toward parts of Eastern European countries.

EUPOS is a growing network, however lacing some white spots in the coverage area.

EUPOS could be an alternative for more (e.g. farmers in precise agriculture) beyond the edge of the EGNOS coverage area.

EGNOS can help to some white spots where *EUPOS* is not yet operable.

EGNOS and *EUPOS* supplement each other in the means of desired precision of measurements.

More options for co-operation are currently being investigated.

EUPOS co-operations and memberships

EUPOS and EUREF have established an information exchange at the start of the co-operation. Reports on discussions and results of both EUREF and *EUPOS* conferences, are to be distributes each to the other organisation.

Bundesamt für Kartographie und Geodäsie

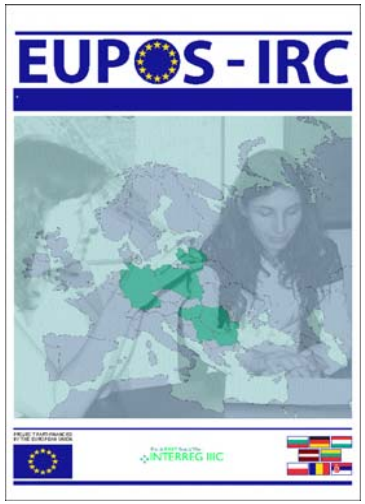
Information on German BKG activities and news are to be distributed to the International *EUPOS* Steering Committee, and reports on the *EUPOS* conferences be distributed to BKG.

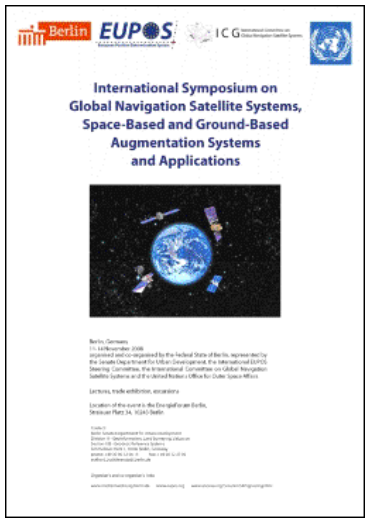
EUPOS is an active member of the Radio Technical Commission for Maritime Services (RTCM).

EUPOS' co-operation with other organisations

A successful series of UNOOSA/... Workshops and of *EUPOS* Symposia related on themes in the field of GNSS, DGNSS Augmentation and Applications started 2008

Further publication of *EUPOS* and Berlin are available





Conclusions

EUPOS is an initiative for close co-operation of currently 19 Central and Eastern European countries, + 3 observers and one German Land that build up a ground based European regional GNSS augmentation system with uniform standards.

The coordinates of the ***EUPOS*** stations are determined with high precision in geodetic reference and coordinate systems which conform the INSPIRE Directive requirements.

EUPOS will use the signals of Galileo as a basic standard as soon as it is available, and GPS and GLONASS as basic standard up to complete availability of Galileo and as optional standard after complete functionality of Galileo.

Thank you for your attention!

www.eupos.org