Procedure for Becoming an EPN Station

Prepared by the EPN Coordination Group and the EPN Central Bureau

Changes

Nov. 5, 2003: Major document revision to reflect the current procedure used at EPN CB
Apr. 22, 2002: IGS stations in Europe no longer automatically part of EPN
Nov. 24, 2000: Update "D. Data Format, Flow and Archive"

This document describes the procedure to be followed by GNSS stations in order to be included in the EUREF Permanent Network (EPN). It is applicable to European GNSS stations of regional interest, and includes detailed steps to be taken by the responsible agency, in consultation with the EPN Central Bureau. In addition to this document, candidate EPN stations should consult the "Guidelines for EPN Stations and Operational Centres" (http://www.epncb.oma.be/_organisation/guidelines/guidelines_station_operationalcentre.html) in order to comply with the detailed station requirements with respect to monumentation, receiver, antenna, data handling, documentation, and data formats as described in this document.
GNSS stations wishing to join also the IGS network need to solicit separately their inclusion into this network (see "Procedures for Becoming an IGS Station" at http://igscb.jpl.nasa.gov/network/join_igs.htm).
Prior to the station installation is it recommended to follow the "Monumentation Design and Implementation Recommendations" (http://igscb.jpl.nasa.gov/network/monumentation.html) issued by the IGS.

All electronic messages, unless otherwise specified, should be sent to the EPN CB at epncb@oma.be.

A. Procedure Summary

A station wishing to be included in the EPN should (unless specified otherwise, all actions should be taken by the Station Manager):

1. Make sure the station complies with the EPN station requirements (follow instructions in **B. Station Installation**)
2. Send a letter to the EPN CB stating the long-term commitment (at least 5 years) to operate the station following EPN Guidelines. The name of the Parent/Funding Organization, name and title of the Authorizing Official, name and title of the Primary Point of Contact, mailing address and phone/fax/e-mail should be included. The letter should be signed both by the Authorizing Official committing the organization/institution to the EPN and the Primary Point of Contact involved.
3. Complete the site log (follow instructions in **C. Documentation Files**) and send it to the EPN CB.
4. The manager of the Operational Centre should (re)submit the Operational Centre description form (follow instructions in **C. Documentation Files**).
5. Send digital station pictures from relevant monuments, markers or collocated instruments to the EPN CB (follow instructions in **C. Documentation Files**).
6. Subscribe to EUREF Mail (instructions at http://www.epncb.oma.be/_newsmails/EUREFmail/mail_rul.html).
7. Contact one of the EPN Data Centres (the Primary Data Centre) to arrange the data flow and test alternative data flow procedures to a Secondary Data Centre (follow instructions in **D. Data Format, Flow and Archive**).
8. Once the EPN CB has accepted and approved the site log, start the station data flow (follow instructions in **D. Data Format, Flow and Archive**) and inform the EPN CB when data flow is running smoothly.

9. When the data quality and consistency checks performed by the EPN CB are successful, the station will be designated to three EPN Local Analysis Centres (see **E. Data Analysis**).
10. The EPN CB will announce through EUREF mail the official integration of the station into the EPN.

The status of the EPN inclusion procedure can viewed on-line from
http://www.epncb.oma.be/_trackingnetwork/planned.html.

B. Station Installation

EPN standards need to be followed when installing the GNSS station. The section “Requirements for permanent Stations” in the document "Guidelines for EPN Stations and Operational Centres” gives a detailed description of these standards.

C. Documentation Files

Operational Centre Description Form

If the new station is part of an existing GNSS local network, the responsible Operational Centre has to update the centre description form (download ftp://ftp.epncb.oma.be/pub/center/oper/'center'.OC, modify it, and send it to the EPN CB).
If the station is part of a new network, the new Operational Centre has to create a centre description form (download ftp://ftp.epncb.oma.be/pub/center/oper/blnkform.OC, modify it, and send it to the EPN CB).

Site Log

For each station a site log must be prepared. The format of the site log is identical to the site log format used within the International GPS Service (IGS). This site log is uniquely linked to the marker that is observed and it describes its observation history (e.g. receiver and antenna changes). In addition, the International Earth Rotation and Reference Systems Service (IERS) assigns to the observed marker a unique DOMES number (used to keep track of all space geodetic stations). If requested (desired!), the IERS can also assign a DOMES number to any other monument or reference marker located at the same site. The four-character abbreviation used for the station is, through the DOMES number, uniquely linked to the marker.
Procedure:

1. Download the Form to request a DOMES number for your station/marker from http://lareg.ensg.ign.fr/ITRF/domes.req. Complete it and send it to domes@ensg.ign.fr.
2. Download a blank site log from ftp://ftp.epncb.oma.be/pub/station/general/blank.log and complete it (add the DOMES number) using the instructions available at
   ftp://epncb.oma.be/pub/station/general/sitelog_instr.txt (source: IGS).
   In addition, many examples are available in ftp://epncb.oma.be/pub/station/log/.
   Use a standard antenna, radome and receiver name from the receiver/antenna table at ftp://epncb.oma.be/pub/station/general/rcvr_ant.table (source: IGS). Check if the antenna used has calibration values listed in the ftp://epncb.oma.be/pub/station/general/antenna.gra (source: IGS). Contact the EPN CB is case the equipment is not known or calibrated.
   The EPN CB will assist in the designation of the four-character station abbreviation to prevent duplication (use http://sopac.ucsd.edu/scripts/checkSiteID.cgi to check duplications).
   If necessary, the EPN CB can assist with the choice of the Primary and Secondary Data Centre. Possible data centres (and contact persons) can be found in ftp://epncb.oma.be/pub/center/data.
3. Validate the contents and the format of the completed site log by submitting it to the automated site log tester at epncbslt@oma.be (some iterations might be necessary). Instructions and FAQ are available at http://www.epncb.oma.be/_trackingnetwork/sitelogsub_test.html.
4. Send the validated site log to the EPN CB.

Station Pictures

To complete the station documentation, digital pictures (gif, jpg, ps, bmp,...) from relevant monuments, markers, collocated instruments, ... need to be sent to the EPN CB. An ASCII readme file including the list of submitted pictures, a short description of each picture and the software used to generate the picture should accompany the pictures. Submitted pictures should be named SSSSi.xxx, with SSSS: 4-char station abbreviation, i: picture number and xxx: picture format (gif, jpg,..).

D. Data Format, Flow and Archive

It is the responsibility of the Operational Agency to provide GNSS data to the EPN in the Receiver Independent Exchange (RINEX) format (see ftp://igscb.jpl.nasa.gov/igscb/data/format/rinex210.txt). The RINEX files must be prepared following the "Guidelines for EPN Stations and Operational Centres".

The following items in the RINEX header should be fully consistent with the info in the site log (use capital letters):

1. 4-character site code (“MARKER NAME” field)
2. DOMES number (“MARKER NUMBER” field)
3. the North, East and Up eccentricities of the antenna (“ANTENNA: DELTA H/E/N” fields)
4. the receiver serial number, type and firmware version (“REC # / TYPE / VERS” fields)
5. the antenna serial number and type including the radome information (“ANT # / TYPE” fields)

Stations have to send their data to one unique EPN Local Data Centre (the so-called Primary Data Centre) from where the data will be forwarded, if desired, to the EPN/IGS Regional Data Centre (RDC). Only if no Local Data Centre (LDC) is available, the stations can directly send their data to the RDC, which will for this station take the role of the Primary Data Centre.
In addition to the Primary Data Centre, each station should have a secondary or alternative data centre (Local or Regional) where it can send its data in case of outages of the primary LDC/RDC. This alternate data flow procedure should be fully tested.
A list of available data centres can be retrieved from the EPN CB web site at http://www.epncb.oma.be/_dataproducts/datacentres/datacentres.html.

For the standard operations, the data delivery to the LDC/RDC must be within the same delay as the IGS precise satellite orbits become available (currently 12 days). Depending on additional requirements (e.g., by contributions to the IGS network, Special Projects, hourly data upload), shorter latencies may be necessary.

The long-term archiving of the raw and RINEX data falls within the responsibility of the Operational Centre.

E. Data Analysis

As the last step in the procedure for a station to be included in the EPN, the EPN CB assigns at least three EPN Analysis Centres (AC) to the station in order to guarantee its data processing. EPN stations need to be processed by at least two AC before they are included in the combined EUREF solution. A list of the EPN Analysis Centres can be found in ftp://ftp.epncb.oma.be/pub/center/analysis.