

# **Monitoring permanentních GNSS stanic v ČR: Výpočet a kombinace z kampaně 05/2015 pro zařazení sítě TopNet do monitoringu**

*Vratislav Filler, Jakub Kostecký*

Technická zpráva č. 1240/2015

---

Ondřejov, červenec 2015

## Obsah

|                                     |    |
|-------------------------------------|----|
| 1. Úvod.....                        | 2  |
| 2. Kampaň 05/2015.....              | 2  |
| 3. Výsledky pro kampaň 05/2015..... | 3  |
| 4. Závěr.....                       | 12 |
| 5. Literatura.....                  | 12 |
| Přílohy – souřadnicové soubory..... | 13 |

### 1. Úvod

Monitoring permanentních stanic v České republice je služba, která slouží k ověřování permanentních stanic, jejichž naměřená data a produkty z nich vzešlé slouží při určování polohy technologiemi GNSS v geodetické praxi. Výsledky zpracování monitoringu permanentních stanic jsou široké veřejnosti publikovány pomocí webových stránek <http://oko.pecny.cz/monitor/>.

**Předmětem této zprávy je řešení kampaně 05/2015**, určené pro vypočtení souřadnic nově zařazovaných stanic sítě TopNet. Jedná se o dílčí kampaň, komplexní zpracování roku 2015 proběhne po jeho skončení.

### 2. Kampaň 05/2015

Od zpracování kampaně 01/2015 [14] nedošlo v řešení kampaně CZECH k větším změnám. Na základě kampaně 2014 [13] byly ke dni 28.6.2015 upraveny ověřené souřadnice stanic CZKO, CZVZ a KUNZ.

#### 2.2 Rozsah kampaně

Kampaň byla realizována pro GPS týdny 1838 - 1847 (tj. 15/088 – 15/157), s referenční epochou 15/121 (1. 5. 2015). Kampaň trvala 70 dnů. Denní řešení kampaně byly realizovány formou běžného denního řešení kampaně CZECH.

#### 2.3 Výpočet kombinace

Kombinace byla realizována na úrovni normálních rovnic (programem Bernese ADDNEQ2) z denních řešení (nebyly tedy použity dílčí týdenní kombinace).

Kombinace proběhla jako „minimum constraint solution“. Jako opěrné stanice byly pro kombinaci použity vybrané stanice EPN, třídy „A“ prakticky stejným způsobem, jakým vstupují do monitoringu. Jedná se o stanice GOPE, WTZR, BOGO, GRAZ, KIRO, MAR6, ONSA, SVTL, TRAB, VIS0, POLV, GANP, BOR1, HFLK, JOZE, PENC, POTS, WROC. Byly použité souřadnice těchto stanic ITRF2005 z kumulativního řešení EUREF z GPS týdnů 860 – 1600 (soubor EPN\_A\_ITRF2005\_C1600)<sup>1</sup>, ze dne 23.10.2012.

Kombinace byla řešena dvoustupňově:

1. První řešení použilo sadu extrapolovaných apriorních souřadnic v systému ITRF2005.

1 [http://epncb.oma.be/\\_productsservices/coordinates/](http://epncb.oma.be/_productsservices/coordinates/)

- Následně byla z kombinace v několika iteracích vylučována řešení s odlehlostí do 6 mm v některé z horizontálních složek a do 20mm ve složce vertikální – další vylučování nebylo možné pro narušení numerické stability řešení. Ze stejného důvodu bylo ze zpracování přímo vyloučeno posledních 8 dnů měření na stanici TJES (technicky to bylo provedeno rozdělením měření na dva intervaly – nezávislé stanice – a uvažováním pouze prvního intervalu). Pro kontrolu byl vypočten rozdíl v souřadnicích mezi oběma intervaly, který činí 7,2 mm v poloze a 5,7 mm ve výšce.

V kombinacích bylo použito silné navázání na apriorní rychlosti v modelu NUVEL-A. U opěrných stanic a tam, kde jsou známy rychlosti z kumulativního řešení EUREF, byly použity přednostně tyto známé rychlosti.

Výsledkem finální kombinace byl soubor výsledných souřadnic v systému ITRS05 ve střední epoše 1. května 2015 (15 / 121). Dalšími výstupy z kombinace jsou SINEX řešení a protokol z programu ADDNEQ2.

### 3. Výsledky pro kampaň 05/2015

Výpočet kombinace v souřadnicovém systému ITRF2005 v epoše řešení se nachází v příloze 1 a v souboru C1501\_05.CRD.

#### 3.1 Formální přesnost řešení kampaně 05/2015

Formální aposteriorní přesnost kombinace byla určena z oprav k výsledné kombinaci. Pro každou stanicí byla určena formální směrodatná odchylka výsledných souřadnic (Root Mean Square, rms) v místní soustavě (osy ve směrech N, E, U - North, East, Up – sever, východ, nahoru) a opakovatelnost denních měření (Repeatability, rpt). Číselné hodnoty jsou uvedeny níže:

| site | rpt. N | rpt. E | rpt. U [mm] | #of sols. | rms N | rms E | rms U [mm] |
|------|--------|--------|-------------|-----------|-------|-------|------------|
| BEZD | 0.99   | 1.64   | 3.23        | 34        | 0.17  | 0.28  | 0.55       |
| BISK | 0.98   | 1.71   | 2.83        | 75        | 0.11  | 0.20  | 0.33       |
| BOGO | 0.00   | 0.00   | 0.00        | 1         | 0.00  | 0.00  | 0.00       |
| BOR1 | 0.65   | 1.17   | 2.56        | 77        | 0.07  | 0.13  | 0.29       |
| BZRG | 1.14   | 1.68   | 3.61        | 77        | 0.13  | 0.19  | 0.41       |
| CBUD | 0.73   | 0.98   | 3.14        | 75        | 0.08  | 0.11  | 0.36       |
| CDAC | 0.96   | 1.04   | 3.43        | 74        | 0.11  | 0.12  | 0.40       |
| CDOM | 0.88   | 1.32   | 3.63        | 75        | 0.10  | 0.15  | 0.42       |
| CFRM | 0.81   | 1.02   | 3.62        | 76        | 0.09  | 0.12  | 0.42       |
| CHOD | 0.93   | 1.40   | 3.88        | 76        | 0.11  | 0.16  | 0.45       |
| CHOT | 1.01   | 1.14   | 2.74        | 76        | 0.12  | 0.13  | 0.31       |
| CJES | 1.09   | 1.59   | 4.03        | 77        | 0.12  | 0.18  | 0.46       |
| CJIH | 1.58   | 1.99   | 3.24        | 75        | 0.18  | 0.23  | 0.37       |
| CKRO | 0.76   | 0.90   | 3.32        | 76        | 0.09  | 0.10  | 0.38       |
| CKVA | 0.82   | 0.97   | 3.08        | 77        | 0.09  | 0.11  | 0.35       |
| CLIB | 1.09   | 1.14   | 3.48        | 77        | 0.12  | 0.13  | 0.40       |
| CLIT | 0.87   | 1.13   | 3.72        | 77        | 0.10  | 0.13  | 0.42       |
| CMBO | 0.66   | 0.89   | 3.24        | 75        | 0.08  | 0.10  | 0.37       |
| CPAR | 0.74   | 0.90   | 3.30        | 77        | 0.08  | 0.10  | 0.38       |
| CPRA | 1.07   | 1.03   | 3.54        | 76        | 0.12  | 0.12  | 0.41       |
| CPRG | 0.67   | 1.11   | 3.39        | 76        | 0.08  | 0.13  | 0.39       |
| CPRI | 0.89   | 1.66   | 3.60        | 75        | 0.10  | 0.19  | 0.42       |
| CRAK | 0.75   | 0.98   | 3.21        | 77        | 0.09  | 0.11  | 0.37       |
| CSUM | 0.91   | 1.11   | 3.15        | 75        | 0.11  | 0.13  | 0.36       |
| CSV1 | 0.69   | 1.09   | 3.21        | 77        | 0.08  | 0.12  | 0.37       |
| CTAB | 0.72   | 1.05   | 2.95        | 77        | 0.08  | 0.12  | 0.34       |
| CTRU | 0.91   | 1.02   | 3.11        | 75        | 0.10  | 0.12  | 0.36       |
| CVSE | 1.11   | 1.08   | 3.19        | 76        | 0.13  | 0.12  | 0.37       |

| site | rpt. N | rpt. E | rpt. U [mm] | #of sols. | rms N | rms E | rms U [mm] |
|------|--------|--------|-------------|-----------|-------|-------|------------|
| CZBC | 0.92   | 1.18   | 3.67        | 76        | 0.11  | 0.14  | 0.42       |
| CZBO | 1.20   | 1.56   | 3.87        | 77        | 0.14  | 0.18  | 0.44       |
| CZBR | 0.88   | 1.15   | 3.50        | 76        | 0.10  | 0.13  | 0.40       |
| CZBV | 1.32   | 1.32   | 3.37        | 77        | 0.15  | 0.15  | 0.38       |
| CZBY | 1.31   | 1.23   | 3.48        | 77        | 0.15  | 0.14  | 0.40       |
| CZCT | 0.83   | 1.30   | 3.59        | 77        | 0.09  | 0.15  | 0.41       |
| CZHB | 1.21   | 2.40   | 3.38        | 77        | 0.14  | 0.27  | 0.38       |
| CZHK | 0.92   | 1.22   | 3.09        | 74        | 0.11  | 0.14  | 0.36       |
| CZHM | 0.78   | 1.23   | 3.32        | 76        | 0.09  | 0.14  | 0.38       |
| CZKO | 1.72   | 1.60   | 3.45        | 76        | 0.20  | 0.18  | 0.40       |
| CZKV | 0.85   | 1.34   | 3.37        | 76        | 0.10  | 0.15  | 0.39       |
| CZLT | 0.94   | 1.38   | 3.55        | 76        | 0.11  | 0.16  | 0.41       |
| CZNB | 1.14   | 1.19   | 3.92        | 75        | 0.13  | 0.14  | 0.45       |
| CZNO | 0.70   | 0.98   | 2.95        | 76        | 0.08  | 0.11  | 0.34       |
| CZNY | 0.97   | 1.38   | 3.22        | 76        | 0.11  | 0.16  | 0.37       |
| CZOL | 0.84   | 1.19   | 3.29        | 77        | 0.10  | 0.14  | 0.37       |
| CZPB | 0.80   | 1.32   | 3.18        | 75        | 0.09  | 0.15  | 0.37       |
| CZPR | 1.96   | 2.07   | 4.32        | 75        | 0.23  | 0.24  | 0.50       |
| CZRA | 0.92   | 1.37   | 3.16        | 76        | 0.11  | 0.16  | 0.36       |
| CZRV | 0.92   | 1.18   | 3.38        | 75        | 0.11  | 0.14  | 0.39       |
| CZRY | 1.00   | 1.18   | 3.78        | 77        | 0.11  | 0.13  | 0.43       |
| CZSL | 0.73   | 1.22   | 3.34        | 77        | 0.08  | 0.14  | 0.38       |
| CZST | 0.70   | 1.29   | 3.74        | 67        | 0.09  | 0.16  | 0.46       |
| CZUB | 2.13   | 1.22   | 3.66        | 76        | 0.24  | 0.14  | 0.42       |
| CZUH | 1.28   | 1.46   | 4.53        | 75        | 0.15  | 0.17  | 0.52       |
| CZUS | 0.76   | 1.19   | 3.42        | 76        | 0.09  | 0.14  | 0.39       |
| CZVM | 0.86   | 1.21   | 2.78        | 73        | 0.10  | 0.14  | 0.32       |
| CZVS | 1.03   | 1.37   | 4.24        | 75        | 0.12  | 0.16  | 0.49       |
| CZVZ | 0.97   | 1.23   | 3.41        | 76        | 0.11  | 0.14  | 0.39       |
| CZZA | 1.26   | 1.22   | 3.56        | 74        | 0.15  | 0.14  | 0.41       |
| DRES | 0.79   | 1.17   | 3.48        | 77        | 0.09  | 0.13  | 0.40       |
| GANP | 2.12   | 2.11   | 5.88        | 60        | 0.27  | 0.27  | 0.76       |
| GOPE | 0.82   | 1.68   | 3.52        | 77        | 0.09  | 0.19  | 0.40       |
| GRAZ | 1.07   | 1.10   | 3.90        | 72        | 0.13  | 0.13  | 0.46       |
| GSR1 | 0.92   | 1.44   | 4.31        | 74        | 0.11  | 0.17  | 0.50       |
| HABA | 0.82   | 1.37   | 3.60        | 77        | 0.09  | 0.16  | 0.41       |
| HOBU | 0.88   | 1.39   | 3.15        | 58        | 0.12  | 0.18  | 0.41       |
| JOZE | 1.10   | 1.40   | 4.32        | 77        | 0.13  | 0.16  | 0.49       |
| KARL | 1.10   | 1.30   | 3.52        | 77        | 0.12  | 0.15  | 0.40       |
| KLOP | 0.94   | 1.61   | 3.44        | 76        | 0.11  | 0.19  | 0.39       |
| KUNZ | 0.95   | 1.67   | 2.87        | 74        | 0.11  | 0.19  | 0.33       |
| KYNS | 0.88   | 1.46   | 3.17        | 70        | 0.11  | 0.18  | 0.38       |
| LINZ | 0.93   | 1.43   | 3.81        | 77        | 0.11  | 0.16  | 0.43       |
| LITO | 0.90   | 1.80   | 4.36        | 63        | 0.11  | 0.23  | 0.55       |
| LYSH | 1.13   | 1.80   | 4.05        | 77        | 0.13  | 0.21  | 0.46       |
| MARJ | 0.66   | 1.34   | 3.42        | 73        | 0.08  | 0.16  | 0.40       |
| ONSA | 1.37   | 1.37   | 3.78        | 38        | 0.22  | 0.22  | 0.61       |
| PENC | 0.89   | 1.30   | 3.00        | 76        | 0.10  | 0.15  | 0.34       |
| PLZN | 0.69   | 1.51   | 3.51        | 76        | 0.08  | 0.17  | 0.40       |
| POL1 | 1.28   | 1.41   | 4.72        | 74        | 0.15  | 0.16  | 0.55       |
| POLV | 1.11   | 2.20   | 4.16        | 77        | 0.13  | 0.25  | 0.47       |
| POTS | 0.72   | 1.22   | 3.20        | 75        | 0.08  | 0.14  | 0.37       |
| POUS | 0.77   | 1.34   | 2.99        | 67        | 0.09  | 0.16  | 0.37       |
| PTBB | 1.10   | 1.58   | 3.07        | 77        | 0.13  | 0.18  | 0.35       |
| STAM | 1.49   | 1.47   | 4.46        | 59        | 0.19  | 0.19  | 0.58       |
| SVTL | 1.55   | 2.77   | 4.42        | 58        | 0.20  | 0.36  | 0.58       |

## TopNet:

|         |      |      |      |      |      |      |      |
|---------|------|------|------|------|------|------|------|
| TBEN    | 0.85 | 1.40 | 2.82 | 76   | 0.10 | 0.16 | 0.32 |
| TBRN    | 0.83 | 1.29 | 2.79 | 75   | 0.10 | 0.15 | 0.32 |
| TCBU    | 0.88 | 1.36 | 3.19 | 76   | 0.10 | 0.16 | 0.37 |
| TCHM    | 0.96 | 1.44 | 4.74 | 76   | 0.11 | 0.17 | 0.54 |
| TJES    | 2.18 | 1.57 | 3.39 | 76   | 0.25 | 0.18 | 0.39 |
| TKRN    | 1.00 | 1.36 | 3.05 | 77   | 0.11 | 0.15 | 0.35 |
| TLUB    | 0.95 | 1.53 | 3.75 | 77   | 0.11 | 0.17 | 0.43 |
| TMIL    | 0.90 | 1.39 | 3.33 | 76   | 0.10 | 0.16 | 0.38 |
| TMLA    | 1.39 | 1.75 | 3.14 | 77   | 0.16 | 0.20 | 0.36 |
| TNYM    | 0.91 | 1.35 | 2.96 | 77   | 0.10 | 0.15 | 0.34 |
| TPLA    | 0.76 | 1.45 | 3.08 | 77   | 0.09 | 0.17 | 0.35 |
| TPOD    | 0.90 | 1.13 | 3.24 | 3    | 0.52 | 0.65 | 1.87 |
| TPR2    | 0.81 | 1.35 | 3.13 | 77   | 0.09 | 0.15 | 0.36 |
| TPRA    | 0.15 | 0.32 | 0.70 | 77   | 0.02 | 0.04 | 0.08 |
| TRAK    | 0.83 | 1.60 | 4.64 | 3    | 0.48 | 0.92 | 2.68 |
| TRAT    | 0.91 | 1.34 | 2.86 | 77   | 0.10 | 0.15 | 0.33 |
| TRNK    | 0.92 | 1.36 | 3.41 | 77   | 0.10 | 0.15 | 0.39 |
| TRYN    | 0.87 | 1.43 | 2.87 | 71   | 0.10 | 0.17 | 0.34 |
| TSEC    | 0.81 | 1.32 | 3.35 | 76   | 0.09 | 0.15 | 0.38 |
| TSLU    | 0.93 | 1.53 | 2.92 | 77   | 0.11 | 0.17 | 0.33 |
| TSUS    | 0.93 | 1.42 | 3.52 | 77   | 0.11 | 0.16 | 0.40 |
| TTRE    | 0.81 | 1.36 | 2.83 | 71   | 0.10 | 0.16 | 0.34 |
| TTUR    | 1.05 | 1.43 | 3.40 | 77   | 0.12 | 0.16 | 0.39 |
| TUPI    | 0.93 | 1.29 | 2.90 | 77   | 0.11 | 0.15 | 0.33 |
| TVID    | 0.81 | 1.42 | 3.50 | 77   | 0.09 | 0.16 | 0.40 |
| TZAL    | 0.95 | 1.48 | 3.80 | 76   | 0.11 | 0.17 | 0.44 |
| TZD2    | 0.97 | 1.37 | 3.18 | 75   | 0.11 | 0.16 | 0.37 |
| TZLI    | 1.03 | 1.48 | 3.37 | 77   | 0.12 | 0.17 | 0.38 |
| TZNO    | 0.76 | 1.41 | 2.73 | 67   | 0.09 | 0.17 | 0.33 |
| TUBO    | 0.96 | 1.82 | 3.07 | 76   | 0.11 | 0.21 | 0.35 |
| UZHL    | 1.11 | 1.57 | 5.01 | 75   | 0.13 | 0.18 | 0.58 |
| VACO    | 1.12 | 1.51 | 4.26 | 61   | 0.14 | 0.19 | 0.55 |
| VSBO    | 0.67 | 1.61 | 3.14 | 77   | 0.08 | 0.18 | 0.36 |
| WROC    | 0.65 | 0.89 | 3.29 | 77   | 0.07 | 0.10 | 0.37 |
| WTZR    | 0.85 | 1.45 | 3.83 | 77   | 0.10 | 0.16 | 0.44 |
| ZOUF    | 1.92 | 1.50 | 3.85 | 76   | 0.22 | 0.17 | 0.44 |
| Average | 1.03 | 1.40 | 3.50 | 8684 | 0.14 | 0.19 | 0.50 |

| Avg. RPT | from BPE | with exclusion |
|----------|----------|----------------|
| Tot. N   | 1.06     | 1.05           |
| Tot. E   | 1.45     | 1.40           |
| Tot. U   | 3.83     | 3.50           |

Obdobné kampaně byly realizovány od roku 2010 [2], [3], [8], [10], [12], [14]. V následující tabulce uvádíme srovnání přesnosti těchto kampaní. V roce 2011 byla kombinace prováděna z týdenních řešení; opakovatelnosti týdenních řešení jsou pro účel tohoto srovnání převedeny na odhad opakovatelnosti denních řešení (vynásobením odmocninou sedmi).

Denní opakovatelnosti kampaně 05/2015 odpovídají obdobným řešením provedeným v dřívějším období. Formální směrodatné odchylky výsledných souřadnic jsou kolem 0,20 mm v poloze a 0,4-1,0 mm ve výšce (s výjimkou stanic s malým počtem zpracovaných dnů). Konzistence kombinovaného řešení je dobrá.

Tabulka 2: Opakovatelnosti řešení jako hodnocení vnitřní přesnosti kombinace.

| Kampaň       | Denní – N [mm] | Denní – E [mm] | Denní – U [mm] |
|--------------|----------------|----------------|----------------|
| 7/2010 [2]   | 1,03           | 1,00           | 3,65           |
| 8/2011 [3]   | 1,53*          | 1,32*          | 4,55*          |
| 7/2012 [8]   | 1,12           | 1,15           | 3,96           |
| 12/2012 [8]  | 1,07           | 1,06           | 4,11           |
| 5/2013 [10]  | 0,94           | 0,81           | 3,51           |
| 10/2013 [12] | 1,07           | 1,08           | 3,89           |
| 01/2015 [14] | 1,14           | 1,61           | 4,22           |
| 05/2015      | 1,03           | 1,40           | 3,50           |

\*) Převedeno z kombinace týdenních řešení.

U stanic TPOD a TRAK byly zpracovány pouze 3 dny, tudíž jsou u nich určené opakovatelnosti výrazně vyšší. Tyto stanice ale nemají být zařazeny do monitoringu.

### 3.2 Převod řešení do ETRF2000(R05)

Pro převod z ITRF2005 do ETRF2000(R05) byly použity nejprve odpovídající parametry čtrnáctiprvkové prostorové transformace (sedmiprvková transformace s časovými změnami parametrů) z publikace [4]. Stejně jako u předchozích kampaní se jedná o období výpočtu kampaně EUREF CZECH 2009 [1], ovšem zde bez dostatečně dlouhých časových řad a také bez podrobného výběru opěrných stanic, který je pro obdobné kampaně nezbytný.

V souhrnu nejsou tyto souřadnice nejvhodnější k přímému srovnání s předchozími kampaněmi, souřadnice nicméně pro úplnost uvádíme v příloze 2 zprávy (soubor C156\_01-E05-sel.CRD).

### 3.3 Převod řešení do národní realizace ETRS89

Vzhledem k potřebě určit souřadnice v ETRS v platné národní realizaci ETRS (podle [1] a [8]) byla použita ještě následná transformace na identické body, které tvoří aktuální realizaci národního referenčního rámce ETRS89. Za tu jsou považovány souřadnice vypočtené z řešení [1] v roce 2009, po obměně antén sítě CZEPOS, a zaktualizované na stanicích CFRM, CPRI (kampaň 7+12/2012 [8]) a dále CHOD a CSVI (kampaň 2013 [11]). Stanice CJES a CBUD instalované v roce 2012 a 2013 jako náhrada rušených stanic CKAP a CBRU nejsou součástí transformačního klíče.

Tato transformace byla provedena pouze s translacemi. Parametry transformace uvádí následující výstup z programu HELMR1:

```

=====
Program : HELMR1                               Bernese GPS Software Version 5.0
Purpose : Helmert Transformation
Campaign: ${P}/CMB_15_6                         Default session: 1210 year 2015
Date    : 10-Jul-2015 13:52                     User name      : eurrap
=====
Srovnani CZ 2015-6 ETRS05 -> narodni realizace aktualni (monit)
-----
FILE 1: 2015-06-28: zmena souradnic KUNZ, CZKO a CZVZ (celorocni kampan
FILE 2: COMPUTED FROM FILE: C156_01.CRD (ETRF2000-R05)

```

LOCAL GEODETIC DATUM: ETRS89  
 RESIDUALS IN LOCAL SYSTEM (NORTH, EAST, UP)

| NUM | NAME            | FLG | RESIDUALS IN MILLIMETERS |      |      |
|-----|-----------------|-----|--------------------------|------|------|
| 6   | GOPE 11502M002  | m W | -1.9                     | 3.0  | -9.0 |
| 9   | TUBO 11503M001  | m A | -1.0                     | -2.3 | 1.5  |
| 159 | LYSH 11522M001  | m A | -0.5                     | 1.8  | -2.8 |
| 16  | KUNZ 11524M001  | m A | -2.2                     | 0.9  | 4.2  |
| 18  | CDAC XXXXXXXXXX | m A | -0.2                     | -4.8 | -7.1 |
| 19  | CDOM XXXXXXXXXX | m A | -2.3                     | -2.1 | 3.9  |
| 42  | CFRM XXXXXXXXXX | m A | -0.7                     | 1.1  | 1.5  |
| 44  | CHOD XXXXXXXXXX | m A | 0.6                      | -0.9 | 2.8  |
| 22  | CJIH XXXXXXXXXX | m A | 3.8                      | 2.4  | -1.5 |
| 23  | CKVA XXXXXXXXXX | m A | -1.3                     | -0.8 | 1.0  |
| 25  | CKRO XXXXXXXXXX | m A | 0.8                      | 2.0  | -3.3 |
| 26  | CLIB XXXXXXXXXX | m A | 0.6                      | 2.9  | -0.7 |
| 27  | CLIT XXXXXXXXXX | m A | 0.9                      | 1.4  | -2.0 |
| 28  | CMBO XXXXXXXXXX | m A | 4.0                      | -2.8 | -0.3 |
| 30  | CPAR XXXXXXXXXX | m A | -0.3                     | -1.0 | 4.7  |
| 31  | CPRA XXXXXXXXXX | m A | -3.3                     | 0.6  | -6.6 |
| 63  | CPRI XXXXXXXXXX | m A | -0.1                     | -2.4 | -1.1 |
| 33  | CRAK XXXXXXXXXX | m A | 4.7                      | -1.8 | -0.8 |
| 34  | CSUM XXXXXXXXXX | m A | 2.0                      | -1.3 | -0.2 |
| 69  | CSVI XXXXXXXXXX | m A | 0.1                      | 0.4  | 1.2  |
| 36  | CTAB XXXXXXXXXX | m A | -0.3                     | -0.4 | 0.6  |
| 37  | CTRU XXXXXXXXXX | m A | -0.4                     | -2.2 | 1.1  |
| 38  | CVSE XXXXXXXXXX | m A | -2.2                     | 2.1  | 5.0  |
| 39  | CPRG XXXXXXXXXX | m A | 0.9                      | 3.7  | 11.5 |
| 40  | CZNO XXXXXXXXXX | m A | -1.6                     | 0.5  | -3.9 |
|     | RMS / COMPONENT |     | 2.0                      | 2.2  | 4.3  |

NUMBER OF PARAMETERS : 3  
 RMS OF TRANSFORMATION : 3.0 MM  
 TRANSLATION IN N : -1.7 +- 0.6 MM  
 TRANSLATION IN E : 3.4 +- 0.6 MM  
 TRANSLATION IN U : 0.2 +- 0.6 MM

Transformace předpokládala, že z klíče budou vyloučeny stanice s odchylkou větší než 5 mm v některé z vodorovných složek a více než 15 mm ve složce svislé. Při tomto nastavení nebylo nutné vyloučit z klíče žádnou stanici. Souřadnice v národní realizaci ETRS89 uvádíme v příloze 3 zprávy (soubor C156\_ETCZ.CRD).

### 3.5 Srovnání kampaně 05/2015 s ověřenými souřadnicemi v monitoringu permanentních stanic

Výsledky kampaně 05/2015 by neměly vykazovat zásadní změny oproti stávajícím ověřeným souřadnicím. Srovnání souřadnic pro jednotlivé stanice ukazuje následující tabulka:

differences in geocentric or local crd. system C156\_ETCZ.CRD - MONIT.CRD

| nr.    | SITE DOME       | Flags | dN [mm] | dE [mm] | dU [mm] | dh [mm] |
|--------|-----------------|-------|---------|---------|---------|---------|
| CZEPOS |                 |       |         |         |         |         |
| 308    | CBUD XXXXXXXXXX | A m   | 0.34    | 0.70    | -3.74   | 0.78    |
| 18     | CDAC XXXXXXXXXX | A m   | 0.23    | 4.89    | 7.08    | 4.89    |
| 19     | CDOM XXXXXXXXXX | A m   | 2.35    | 1.93    | -3.99   | 3.04    |
| 42     | CFRM XXXXXXXXXX | A m   | 0.68    | -0.98   | -1.49   | 1.19    |
| 44     | CHOD XXXXXXXXXX | A m   | -0.68   | 0.92    | -2.73   | 1.14    |
| 307    | CJES XXXXXXXXXX | A m   | -0.66   | -0.74   | 0.81    | 0.99    |
| 22     | CJIH XXXXXXXXXX | A m   | -3.82   | -2.34   | 1.56    | 4.48    |
| 25     | CKRO XXXXXXXXXX | A m   | -0.74   | -2.10   | 3.27    | 2.23    |

| nr. | SITE | DOMEX      | Flags |   | dN [mm] | dE [mm] | dU [mm] | dh [mm] |
|-----|------|------------|-------|---|---------|---------|---------|---------|
| 23  | CKVA | XXXXXXXXXX | A     | m | 1.34    | 0.79    | -0.99   | 1.56    |
| 26  | CLIB | XXXXXXXXXX | A     | m | -0.71   | -2.86   | 0.70    | 2.94    |
| 27  | CLIT | XXXXXXXXXX | A     | m | -1.00   | -1.34   | 1.99    | 1.67    |
| 28  | CMBO | XXXXXXXXXX | A     | m | -3.97   | 2.86    | 0.30    | 4.89    |
| 30  | CPAR | XXXXXXXXXX | A     | m | 0.30    | 1.02    | -4.69   | 1.07    |
| 31  | CPRA | XXXXXXXXXX | A     | m | 3.28    | -0.56   | 6.55    | 3.33    |
| 39  | CPRG | XXXXXXXXXX | A     | m | -0.92   | -3.76   | -11.48  | 3.87    |
| 63  | CPRI | XXXXXXXXXX | A     | m | 0.12    | 2.43    | 1.08    | 2.43    |
| 33  | CRAK | XXXXXXXXXX | A     | m | -4.68   | 1.99    | 0.78    | 5.08    |
| 34  | CSUM | XXXXXXXXXX | A     | m | -2.04   | 1.25    | 0.28    | 2.39    |
| 69  | CSVI | XXXXXXXXXX | A     | m | -0.10   | -0.31   | -1.23   | 0.32    |
| 36  | CTAB | XXXXXXXXXX | A     | m | 0.26    | 0.47    | -0.62   | 0.54    |
| 37  | CTRU | XXXXXXXXXX | A     | m | 0.41    | 2.27    | -1.11   | 2.30    |
| 38  | CVSE | XXXXXXXXXX | A     | m | 2.17    | -1.87   | -5.03   | 2.86    |
| 40  | CZNO | XXXXXXXXXX | A     | m | 1.64    | -0.48   | 3.88    | 1.71    |

Trimble

|     |      |            |   |   |       |       |       |      |
|-----|------|------------|---|---|-------|-------|-------|------|
| 73  | CZBC | XXXXXXXXXX | A | m | 1.81  | 2.26  | -4.51 | 2.89 |
| 74  | CZBO | XXXXXXXXXX | A | m | 0.36  | 0.93  | -2.05 | 1.00 |
| 81  | CZBR | XXXXXXXXXX | A | m | 2.11  | -0.90 | -4.20 | 2.29 |
| 76  | CZBV | XXXXXXXXXX | A | m | -0.15 | 0.84  | -0.78 | 0.85 |
| 77  | CZBY | XXXXXXXXXX | A | m | 1.53  | 0.80  | -0.39 | 1.73 |
| 78  | CZCT | XXXXXXXXXX | A | m | 1.23  | -1.88 | -1.82 | 2.25 |
| 79  | CZHB | XXXXXXXXXX | A | m | -0.63 | 2.01  | -1.44 | 2.10 |
| 80  | CZHK | XXXXXXXXXX | A | m | 0.78  | 1.64  | 9.63  | 1.82 |
| 87  | CZHM | XXXXXXXXXX | A | m | 2.30  | -1.88 | 0.15  | 2.97 |
| 88  | CZKO | XXXXXXXXXX | A | m | 0.80  | 0.82  | -0.80 | 1.15 |
| 89  | CZKV | XXXXXXXXXX | A | m | 2.47  | -1.15 | -5.30 | 2.72 |
| 90  | CZLT | XXXXXXXXXX | A | m | 1.89  | -2.52 | -3.89 | 3.15 |
| 319 | CZNB | XXXXXXXXXX | A | m | 0.07  | 1.81  | -3.41 | 1.82 |
| 91  | CZNY | XXXXXXXXXX | A | m | 2.73  | -1.62 | -1.66 | 3.18 |
| 92  | CZOL | XXXXXXXXXX | A | m | 2.13  | -1.38 | -5.75 | 2.53 |
| 93  | CZPB | XXXXXXXXXX | A | m | 1.55  | -0.03 | -6.95 | 1.55 |
| 89  | CZPR | XXXXXXXXXX | A | m | 2.26  | 0.26  | -1.38 | 2.28 |
| 95  | CZRA | XXXXXXXXXX | A | m | 2.46  | -1.28 | -1.40 | 2.77 |
| 320 | CZRV | XXXXXXXXXX | A | m | -1.00 | 2.63  | -0.73 | 2.81 |
| 91  | CZRY | XXXXXXXXXX | A | m | -0.13 | -0.15 | 0.11  | 0.20 |
| 92  | CZSL | XXXXXXXXXX | A | m | 2.60  | -0.36 | -0.80 | 2.62 |
| 98  | CZST | XXXXXXXXXX | A | m | 4.09  | -0.02 | -5.37 | 4.09 |
| 94  | CZUB | XXXXXXXXXX | A | m | -1.38 | -0.38 | -5.29 | 1.43 |
| 100 | CZUH | XXXXXXXXXX | A | m | 1.62  | -3.19 | -3.68 | 3.57 |
| 101 | CZUS | XXXXXXXXXX | A | m | 3.31  | -1.63 | -6.00 | 3.69 |
| 321 | CZVM | XXXXXXXXXX | A | m | 0.07  | 1.16  | -3.88 | 1.16 |
| 322 | CZVS | XXXXXXXXXX | A | m | 1.33  | 1.13  | 0.45  | 1.74 |
| 102 | CZVZ | XXXXXXXXXX | A | m | 0.62  | 1.64  | -4.33 | 1.75 |
| 323 | CZZA | XXXXXXXXXX | A | m | 0.71  | 1.40  | -4.29 | 1.57 |

Vesog

|     |      |            |   |   |       |       |       |      |
|-----|------|------------|---|---|-------|-------|-------|------|
| 6   | GOPE | 11502M002  | W | m | 1.85  | -2.92 | 9.03  | 3.46 |
| 16  | KUNZ | 11524M001  | A | m | 2.14  | -0.88 | -4.23 | 2.31 |
| 159 | LYSH | 11522M001  | A | m | 0.50  | -1.83 | 2.73  | 1.90 |
| 324 | PLZN | XXXXXXXXXX | A | m | 1.18  | -0.77 | 1.75  | 1.41 |
| 78  | POL1 | XXXXXXXXXX | A | m | 2.13  | 4.96  | 6.16  | 5.40 |
| 9   | TUBO | 11503M001  | A | m | 0.88  | 2.35  | -1.42 | 2.51 |
| 291 | VSBO | 11521M001  | A | m | -1.00 | -1.47 | 2.80  | 1.78 |
| 59  | _AVE |            | x | x | 0.66  | 0.08  | -1.05 | 0.67 |



Podle metodiky pro monitoring [9] se ověřované souřadnice mění tehdy, pokud by rozdíl mezi ověřovanými a doporučenými (nově určenými) souřadnicemi překročil 5 mm v poloze nebo 15 mm ve výšce.

Tuto odchylku překračují stanice CRAK a POL1 (nejvýše o 5,4 mm v poloze). Jelikož se ale nejedná o zpracování celoroční kampaně, nebudou pro stanici CRAK a POL1 navrhovány nové ověřené souřadnice.

### 3.6 Srovnání kampaně 05/2015 s výsledky celoroční kampaně 2014

differences in geocentric or local crd. system C156\_ETCZ.CRD -  
/home/eurrap/GPSDATA/CMB\_14/CRD/C14\_ETCZ.CRD

| nr. | SITE | DOMEX      | Flags |   | dN [mm] | dE [mm] | dU [mm] | dh [mm] |
|-----|------|------------|-------|---|---------|---------|---------|---------|
| 16  | BEZD | XXXXXXXXXX | A     | A | -0.31   | -0.96   | 3.11    | 1.01    |
| 17  | BISK | 11520M001  | A     | A | -0.03   | -1.58   | 2.63    | 1.58    |
| 19  | BOGO | 12207M002  | W     | W | -0.38   | -0.06   | 14.41   | 0.39    |
| 21  | BOR1 | 12205M002  | W     | W | -0.96   | -1.19   | 1.75    | 1.53    |
| 30  | BZRG | 12751M001  | A     | A | 0.75    | 2.31    | 1.77    | 2.43    |
| 316 | CBUD | XXXXXXXXXX | A     | A | 0.20    | 0.66    | -1.24   | 0.69    |
| 38  | CDAC | XXXXXXXXXX | A     | A | -0.16   | 0.86    | 0.80    | 0.87    |
| 40  | CDOM | XXXXXXXXXX | A     | A | 0.14    | 0.04    | -0.77   | 0.14    |
| 42  | CFRM | XXXXXXXXXX | A     | A | 0.05    | -0.29   | -0.57   | 0.29    |
| 44  | CHOD | XXXXXXXXXX | A     | A | -0.22   | 0.60    | -2.20   | 0.64    |
| 45  | CHOT | XXXXXXXXXX | A     | A | 0.41    | 0.37    | 3.06    | 0.55    |
| 307 | CJES | XXXXXXXXXX | A     | A | 0.30    | -0.12   | -1.16   | 0.33    |
| 46  | CJIH | XXXXXXXXXX | A     | A | -1.18   | 0.75    | 0.22    | 1.40    |
| 48  | CKRO | XXXXXXXXXX | A     | A | -0.05   | -0.04   | -0.88   | 0.06    |
| 49  | CKVA | XXXXXXXXXX | A     | A | -0.03   | 0.33    | -2.32   | 0.33    |
| 51  | CLIB | XXXXXXXXXX | A     | A | -0.88   | -0.42   | -0.44   | 0.98    |
| 52  | CLIT | XXXXXXXXXX | A     | A | -0.26   | -0.15   | -0.69   | 0.30    |
| 54  | CMBO | XXXXXXXXXX | A     | A | -0.26   | -0.15   | -0.05   | 0.30    |
| 59  | CPAR | XXXXXXXXXX | A     | A | 0.03    | -0.37   | 0.36    | 0.37    |
| 60  | CPRA | XXXXXXXXXX | A     | A | 0.98    | 0.87    | 0.21    | 1.31    |
| 61  | CPRG | XXXXXXXXXX | A     | A | -0.12   | -0.12   | -0.68   | 0.17    |
| 63  | CPRI | XXXXXXXXXX | A     | A | -0.27   | 1.63    | -0.17   | 1.65    |
| 65  | CRAK | XXXXXXXXXX | A     | A | -0.26   | 0.14    | -1.22   | 0.30    |
| 68  | CSUM | XXXXXXXXXX | A     | A | -0.16   | -0.20   | -0.78   | 0.26    |
| 69  | CSVI | XXXXXXXXXX | A     | A | -0.52   | -0.47   | -0.35   | 0.70    |
| 70  | CTAB | XXXXXXXXXX | A     | A | 0.31    | 0.12    | 0.26    | 0.34    |
| 71  | CTRU | XXXXXXXXXX | A     | A | 0.99    | 0.52    | 1.77    | 1.12    |
| 72  | CVSE | XXXXXXXXXX | A     | A | -0.56   | -0.57   | -0.45   | 0.79    |
| 73  | CZBC | XXXXXXXXXX | A     | A | 0.58    | 3.35    | -3.03   | 3.40    |
| 74  | CZBO | XXXXXXXXXX | A     | A | 0.31    | 0.98    | -2.40   | 1.03    |
| 75  | CZBR | XXXXXXXXXX | A     | A | 0.15    | 1.02    | -0.79   | 1.04    |
| 76  | CZBV | XXXXXXXXXX | A     | A | -0.94   | 1.53    | -2.08   | 1.79    |
| 77  | CZBY | XXXXXXXXXX | A     | A | 0.76    | 0.98    | 0.27    | 1.24    |
| 78  | CZCT | XXXXXXXXXX | A     | A | -0.51   | 1.27    | 0.95    | 1.37    |
| 79  | CZHB | XXXXXXXXXX | A     | A | -0.66   | 1.07    | 0.18    | 1.26    |
| 80  | CZHK | XXXXXXXXXX | A     | A | -0.75   | 2.15    | 5.57    | 2.28    |
| 81  | CZHM | XXXXXXXXXX | A     | A | -0.41   | 1.14    | 0.08    | 1.21    |
| 82  | CZKO | XXXXXXXXXX | A     | A | 0.80    | 0.82    | -0.80   | 1.15    |
| 83  | CZKV | XXXXXXXXXX | A     | A | -0.03   | 1.65    | -1.53   | 1.65    |
| 84  | CZLT | XXXXXXXXXX | A     | A | -0.53   | 1.60    | -0.34   | 1.69    |
| 319 | CZNB | XXXXXXXXXX | A     | A | -0.95   | 2.22    | -3.36   | 2.41    |
| 85  | CZNO | XXXXXXXXXX | A     | A | 0.18    | 0.48    | -0.69   | 0.51    |
| 86  | CZNY | XXXXXXXXXX | A     | A | 0.07    | 1.78    | -1.50   | 1.78    |
| 87  | CZOL | XXXXXXXXXX | A     | A | -0.64   | 1.10    | -1.03   | 1.28    |
| 88  | CZPB | XXXXXXXXXX | A     | A | -0.41   | 2.76    | -2.28   | 2.79    |
| 89  | CZPR | XXXXXXXXXX | A     | A | -0.93   | 0.84    | -4.96   | 1.26    |

| nr. | SITE | DOMEX      | Flags |   | dN [mm] | dE [mm] | dU [mm] | dh [mm] |
|-----|------|------------|-------|---|---------|---------|---------|---------|
| 90  | CZRA | XXXXXXXXXX | A     | A | -0.25   | 1.65    | -0.96   | 1.67    |
| 320 | CZRV | XXXXXXXXXX | A     | A | -2.04   | 2.91    | 0.28    | 3.56    |
| 91  | CZRY | XXXXXXXXXX | A     | A | -0.38   | 0.84    | 0.06    | 0.93    |
| 92  | CZSL | XXXXXXXXXX | A     | A | 0.43    | 1.56    | -0.11   | 1.62    |
| 93  | CZST | XXXXXXXXXX | A     | A | 0.50    | 1.76    | -3.33   | 1.83    |
| 94  | CZUB | XXXXXXXXXX | A     | A | -0.46   | 1.09    | -2.25   | 1.19    |
| 95  | CZUH | XXXXXXXXXX | A     | A | -0.43   | 0.97    | -1.20   | 1.06    |
| 96  | CZUS | XXXXXXXXXX | A     | A | -0.08   | 1.94    | -0.59   | 1.95    |
| 321 | CZVM | XXXXXXXXXX | A     | A | -1.41   | 1.50    | -1.30   | 2.05    |
| 322 | CZVS | XXXXXXXXXX | A     | A | 0.02    | 1.25    | 3.62    | 1.25    |
| 97  | CZVZ | XXXXXXXXXX | A     | A | 0.62    | 1.64    | -4.33   | 1.75    |
| 323 | CZZA | XXXXXXXXXX | A     | A | -0.67   | 1.61    | -1.92   | 1.74    |
| 104 | DRES | 14108M001  | A     | A | 0.46    | 1.11    | -0.63   | 1.20    |
| 116 | GANP | 11515M001  | W     | W | 0.51    | 3.11    | 4.46    | 3.15    |
| 119 | GOPE | 11502M002  | W     | W | 0.49    | -1.15   | 4.29    | 1.25    |
| 121 | GRAZ | 11001M002  | W     | W | 1.18    | 1.07    | 1.09    | 1.59    |
| 122 | GSR1 | 14501M001  | A     | A | 2.18    | 2.60    | -1.83   | 3.39    |
| 308 | HABA | XXXXXXXXXX | A     | A | 1.22    | 0.40    | 2.24    | 1.28    |
| 128 | HOBU | 14202M003  | A     | A | -0.57   | 1.77    | -2.07   | 1.86    |
| 139 | JOZE | 12204M001  | W     | W | -1.01   | -0.97   | 0.53    | 1.40    |
| 140 | KARL | 14216M001  | A     | A | 1.04    | 2.67    | -2.36   | 2.87    |
| 145 | KLOP | 14214M002  | A     | A | 0.37    | 2.29    | -1.22   | 2.32    |
| 148 | KUNZ | 11524M001  | A     | A | 2.14    | -0.88   | -4.23   | 2.31    |
| 309 | KYNS | XXXXXXXXXX | A     | A | 0.68    | 1.14    | 2.17    | 1.33    |
| 154 | LINZ | 11033S001  | A     | A | -0.78   | 0.39    | -0.11   | 0.87    |
| 310 | LITO | XXXXXXXXXX | A     | A | -0.87   | 0.46    | 1.23    | 0.98    |
| 159 | LYSH | 11522M001  | A     | A | -0.39   | -0.47   | 1.25    | 0.61    |
| 164 | MARJ | 11517M001  | A     | A | 0.77    | -0.49   | 4.29    | 0.92    |
| 185 | ONSA | 10402M004  | W     | W | -1.74   | 0.23    | 4.20    | 1.76    |
| 192 | PENC | 11206M006  | W     | W | 0.08    | 1.58    | 0.60    | 1.58    |
| 324 | PLZN | XXXXXXXXXX | A     | A | 0.57    | -0.70   | 1.22    | 0.91    |
| 195 | POL1 | XXXXXXXXXX | A     | A | 2.40    | 5.07    | -0.82   | 5.61    |
| 196 | POLV | 12336M001  | W     | W | 0.06    | -4.97   | 0.60    | 4.97    |
| 198 | POUS | 11518M001  | A     | A | -0.95   | 1.21    | -0.25   | 1.54    |
| 200 | PTBB | 14234M001  | A     | A | -0.28   | 1.72    | -1.17   | 1.74    |
| 306 | STAM | XXXXXXXXXX | A     | A | -0.17   | 0.19    | -0.12   | 0.26    |

**TopNet:**

|     |      |            |   |   |       |       |       |      |
|-----|------|------------|---|---|-------|-------|-------|------|
| 231 | TBEN | XXXXXXXXXX | A | A | -0.11 | 0.84  | 1.01  | 0.85 |
| 233 | TBRN | XXXXXXXXXX | A | A | -0.89 | -1.25 | -3.20 | 1.53 |
| 234 | TCBU | XXXXXXXXXX | A | A | 0.29  | 0.70  | 1.08  | 0.76 |
| 235 | TCHM | XXXXXXXXXX | A | A | -0.45 | -0.13 | 2.32  | 0.47 |
| 240 | TJES | XXXXXXXXXX | A | A | -0.72 | 0.55  | 1.53  | 0.91 |
| 241 | TKRN | XXXXXXXXXX | A | A | -0.06 | -0.08 | 1.36  | 0.10 |
| 244 | TMIL | XXXXXXXXXX | A | A | 0.19  | -0.05 | 1.15  | 0.20 |
| 245 | TMLA | XXXXXXXXXX | A | A | 0.10  | -0.37 | 0.44  | 0.39 |
| 246 | TNYM | XXXXXXXXXX | A | A | -0.66 | 1.20  | 0.68  | 1.37 |
| 249 | TPLA | XXXXXXXXXX | A | A | -0.46 | 0.50  | 0.26  | 0.68 |
| 250 | TPOD | XXXXXXXXXX | A | A | -0.59 | 0.28  | 1.05  | 0.65 |
| 253 | TRAK | XXXXXXXXXX | A | A | 0.62  | -1.98 | 3.52  | 2.07 |
| 254 | TRAT | XXXXXXXXXX | A | A | -1.65 | -0.14 | -0.68 | 1.66 |
| 256 | TRNK | XXXXXXXXXX | A | A | -0.05 | -0.05 | 1.87  | 0.07 |
| 263 | TSUS | XXXXXXXXXX | A | A | 0.02  | 1.24  | 0.64  | 1.24 |
| 265 | TTUR | XXXXXXXXXX | A | A | -0.25 | 0.41  | 1.50  | 0.49 |
| 271 | TZAL | XXXXXXXXXX | A | A | -0.67 | 0.19  | 1.85  | 0.70 |
| 272 | TZD2 | XXXXXXXXXX | A | A | -0.32 | 0.69  | 0.41  | 0.76 |
| 274 | TZLI | XXXXXXXXXX | A | A | 0.01  | 0.03  | -0.14 | 0.03 |

| nr. | SITE | DOMEX     | Flags |   | dN [mm] | dE [mm] | dU [mm] | dh [mm] |
|-----|------|-----------|-------|---|---------|---------|---------|---------|
| 267 | TUBO | 11503M001 | A     | A | 0.30    | 0.10    | 1.99    | 0.31    |
| 279 | UZHL | 12301M001 | A     | A | -0.30   | -1.17   | -4.00   | 1.20    |
| 281 | VACO | 11516M001 | A     | A | 0.03    | 1.35    | -1.35   | 1.35    |
| 291 | VSBO | 11521M001 | A     | A | -0.06   | -1.99   | 1.36    | 1.99    |
| 294 | WROC | 12217M001 | W     | W | 0.30    | -0.04   | 0.02    | 0.30    |
| 296 | WTZR | 14201M010 | W     | W | 0.40    | 1.36    | 0.31    | 1.42    |
| 302 | ZOUF | 12763M001 | A     | A | 3.12    | 2.09    | -2.13   | 3.75    |
| 108 | _AVE |           | x     | x | -0.05   | 0.65    | 0.12    | 0.65    |

Zde je možné porovnat výsledky u některých již dříve zpracovávaných stanic sítě TopNet. Toto srovnání je významné proto, že kampaň 2014 nabízí výsledky z delší časové řady (a pokrývá tedy i případné roční periodické změny polohy), byť jen pro některé stanice sítě TopNet určené pro monitoring.

Ze srovnání souřadnic vyplývá, že rozdíly mezi výpočtem z kampaně 2014 a z kampaně 5/2015 nepřesahují 2,1 mm v poloze a 3,52 mm ve výšce, což je pro účely monitoringu poměrně hluboko pod limitními odchylkami.

Pro volbu nových ověřených souřadnic se z důvodu větší vnitřní konzistence přikláníme k použití výsledku kampaně 5/2015 pro všechny stanice sítě TopNet.

### 3.7 Nové ověřené souřadnice stanic sítě TopNet

V rámci kampaně byly k zařazení do monitoringu vypočteny tyto souřadnice nových stanic sítě TopNet v národní realizaci ETRS89:

| NUM | STATION NAME     | X (M)        | Y (M)        | Z (M)        | FLAG |
|-----|------------------|--------------|--------------|--------------|------|
| 231 | TBEN XXXXXXXXXXX | 3992165.4534 | 1045990.2897 | 4847277.9035 | A    |
| 233 | TBRN XXXXXXXXXXX | 4000657.8416 | 1195481.4112 | 4805612.3389 | A    |
| 234 | TCBU XXXXXXXXXXX | 4061268.2735 | 1049763.3258 | 4789143.6358 | A    |
| 235 | TCHM XXXXXXXXXXX | 3958228.2654 | 943093.5963  | 4895641.4182 | A    |
| 240 | TJES XXXXXXXXXXX | 3940252.2726 | 1273000.8085 | 4835386.4147 | A    |
| 241 | TKRN XXXXXXXXXXX | 3906542.7565 | 1245513.4993 | 4869622.7753 | A    |
| 243 | TLUB XXXXXXXXXXX | 3991598.5802 | 878173.3146  | 4880936.3626 | A    |
| 244 | TMIL XXXXXXXXXXX | 4025495.4472 | 1031912.2793 | 4822953.1295 | A    |
| 245 | TMLA XXXXXXXXXXX | 3951448.3827 | 1177116.5199 | 4850616.7970 | A    |
| 246 | TNYM XXXXXXXXXXX | 3951156.7092 | 1063109.3197 | 4876647.2452 | A    |
| 249 | TPLA XXXXXXXXXXX | 4018660.5467 | 907817.9376  | 4853353.6601 | A    |
| 305 | TPR2 XXXXXXXXXXX | 3969161.4243 | 1221946.1308 | 4824928.2799 | A    |
| 251 | TPRA XXXXXXXXXXX | 3968103.8931 | 1023533.4389 | 4871446.4491 | A    |
| 254 | TRAT XXXXXXXXXXX | 4012020.7212 | 1238919.5594 | 4785233.8136 | A    |
| 256 | TRNK XXXXXXXXXXX | 3929946.5467 | 1147028.3535 | 4874940.2872 | A    |
| 259 | TRYN XXXXXXXXXXX | 4013477.8766 | 1092813.2703 | 4819654.8718 | A    |
| 260 | TSEC XXXXXXXXXXX | 3968820.6229 | 1111804.5467 | 4851986.1929 | A    |
| 261 | TSLU XXXXXXXXXXX | 3894884.3756 | 1004403.2663 | 4933866.8729 | A    |
| 263 | TSUS XXXXXXXXXXX | 4056131.5918 | 976727.1115  | 4808865.9628 | A    |
| 264 | TTRE XXXXXXXXXXX | 4016300.2422 | 1142456.2347 | 4805816.0453 | A    |
| 265 | TTUR XXXXXXXXXXX | 3916933.2423 | 1059508.2845 | 4904848.8695 | A    |
| 269 | TUPI XXXXXXXXXXX | 3907112.2412 | 1121153.2318 | 4899218.3784 | A    |
| 270 | TVID XXXXXXXXXXX | 3894199.4106 | 1204371.3856 | 4889573.9741 | A    |
| 271 | TZAL XXXXXXXXXXX | 3940858.3850 | 989526.9394  | 4900209.8490 | A    |
| 272 | TZD2 XXXXXXXXXXX | 3986175.7905 | 1138777.6765 | 4831679.3394 | A    |
| 274 | TZLI XXXXXXXXXXX | 3976492.4914 | 1267579.8851 | 4807220.7790 | A    |
| 275 | TZNO XXXXXXXXXXX | 4040135.2667 | 1162173.7784 | 4780963.1839 | A    |

## 4. Závěr

V rámci kampaně 05/2015 byly vypočteny souřadnice 27 nových stanic monitoringu sítě TopNet. Data pro výpočet byla získána v potřebné kvalitě. Na základě srovnání výsledků kampaně 5/2015 s výsledky celoroční kampaně 2014, kde již byly souřadnice některých stanic sítě TopNet vypočteny, bylo rozhodnuto navrhnout jako ověřené souřadnice z výpočtu kampaně 05/2015.

V budoucnu bude žádoucí určení konzistentních souřadnic všech stanic sítě ve společném řešení z celoroční kombinace. Dále bude nezbytné věnovat pozornost stanici TJES, která ke konci kampaně systematicky změnila polohu o cca 7 mm (to v monitoringu povede k dlouhodobému stavu „malá odlehlost“, stanice ale bude ověřena). Počet dnů v kampani po změně polohy ale neumožňuje spolehlivě určit ověřené souřadnice této stanice a proto tato záležitost bude řešena po zpracování celoroční kampaně.

## 5. Literatura

- [1] Jan Douša, Vratislav Filler, Jakub Kostecký, Jan Kostecký, Jaroslav Šimek: EUREF-Czech-2009 Campaign, Final Report, VÚGTK, září 2010. Technická zpráva VÚGTK č. 1158/2010.
- [2] Filler V.: Kostecký J.jr.: Kombinace řešení kampaně CZECH 1/2010 pro výpočet souřadnic stanic sítě CZEPOS, Trimble VRS Now Czech a TopNet. Technická zpráva VÚGTK č. 1152/2010
- [3] Filler V.: Kostecký J.jr.: Výpočet souřadnic stanic sítě TopNet v národní realizaci ETRS2000 v roce 2011 Technická zpráva VÚGTK č. 1178/2011
- [4] Boucher, C; Altamini, Z.: Memo : Specifications for reference frame fixing in the analysis of a EUREF GPS campaign. <http://etrs89.ensg.ign.fr/memo-V7.pdf>
- [5] Filler V.: Kostecký J.jr.: Zpráva o monitoringu stanic GNSS sítě TRIMBLE VRS NOW CZECH v roce 2012, Zpráva VÚGTK č.j. 24-1340/2012
- [6] Filler V.: Kostecký J.jr.: Výpočet souřadnic stanic sítě TopNet v národní realizaci ETRS2000 v roce 2012. Technická zpráva VÚGTK č. 1195/2012
- [7] Böhm, J.; Radouch, V.; Hampacher, M.: Teorie chyb a vyrovnávací počet, GKP 1990.
- [8] Filler V.: Kostecký J.jr.: Monitoring permanentních stanic GNSS a kampaň CZECH v roce 2012: Technická zpráva VÚGTK č. 1194/2013.
- [9] Filler V.: Kostecký J.jr.: Metodika pro ověření polohy a monitoring kvality dat a polohy permanentních stanic GNSS sloužících k určování polohy technologií GNSS v závazných referenčních souřadnicových systémech. Technická zpráva VÚGTK č. 1132/2008
- [10] Kostecký Jakub, Filler Vratislav: Výpočet a kombinace z kampaně 5/2013. Technická zpráva VÚGTK č. 1202/2013.
- [11] Filler Vratislav, Kostecký Jakub: Celoroční kombinace monitoringu permanentních stanic - kampaně CZECH - 2013. Technická zpráva VÚGTK č. 1226/2014.
- [12] Filler Vratislav, Kostecký Jakub: Monitoring permanentních GNSS stanic v ČR: Výpočet a kombinace z kampaně 10/2013. Technická zpráva VÚGTK č. 1217/2013
- [13] Filler Vratislav, Kostecký Jakub: Celoroční kombinace kampaně CZECH – 2014. Technická zpráva VÚGTK č. 1238/2015
- [14] Filler Vratislav, Kostecký Jakub: Monitoring permanentních GNSS stanic v ČR: Výpočet a kombinace z kampaně 01/2015. Technická zpráva VÚGTK č. 1237/2015

## Přílohy – souřadnicové soubory

### Příloha 1: – souřadnice z kampaně 05/2015 v ITRF2005

Kombinace CZECH 15/6, TJES cut

10-JUL-15 13:16

-----  
LOCAL GEODETIC DATUM: ITRF2005

EPOCH: 2015-05-01 0:00:00

| NUM | STATION NAME     | X (M)        | Y (M)        | Z (M)        | FLAG |
|-----|------------------|--------------|--------------|--------------|------|
| 16  | BEZD XXXXXXXXXXX | 3902726.3063 | 1136008.4712 | 4899384.1658 | A    |
| 17  | BISK 11520M001   | 3898945.7775 | 1223993.5267 | 4881826.5502 | A    |
| 19  | BOGO 12207M002   | 3633738.8001 | 1397434.2910 | 5035353.5826 | W    |
| 21  | BOR1 12205M002   | 3738358.2873 | 1148173.8703 | 5021815.8721 | W    |
| 30  | BZRG 12751M001   | 4312657.3409 | 864634.8421  | 4603844.5706 | A    |
| 38  | CDAC XXXXXXXXXXX | 4035070.3000 | 1114232.3237 | 4796779.1963 | A    |
| 40  | CDOM XXXXXXXXXXX | 4049956.0481 | 929357.6545  | 4823342.3537 | A    |
| 42  | CFRM XXXXXXXXXXX | 3924572.6796 | 1301971.3963 | 4840464.7975 | A    |
| 44  | CHOD XXXXXXXXXXX | 4018665.0254 | 1238535.3675 | 4779742.8848 | A    |
| 45  | CHOT XXXXXXXXXXX | 3979114.8874 | 1116430.1153 | 4842575.1362 | A    |
| 46  | CJIH XXXXXXXXXXX | 4006712.6017 | 1117669.3399 | 4819598.0579 | A    |
| 48  | CKRO XXXXXXXXXXX | 3976868.1773 | 1246286.3736 | 4812394.9806 | A    |
| 49  | CKVA XXXXXXXXXXX | 3986036.5831 | 908669.9271  | 4879721.9313 | A    |
| 51  | CLIB XXXXXXXXXXX | 3903195.0539 | 1050232.6418 | 4917869.9475 | A    |
| 52  | CLIT XXXXXXXXXXX | 3938729.8718 | 992283.1043  | 4901389.1407 | A    |
| 54  | CMBO XXXXXXXXXXX | 3935718.2083 | 1047652.8712 | 4892416.7255 | A    |
| 59  | CPAR XXXXXXXXXXX | 3949918.6049 | 1116467.4378 | 4865832.8475 | A    |
| 60  | CPRA XXXXXXXXXXX | 4067219.1155 | 1013765.8796 | 4792089.4759 | A    |
| 61  | CPRG XXXXXXXXXXX | 3967685.0378 | 1022867.7218 | 4872004.4908 | A    |
| 63  | CPRI XXXXXXXXXXX | 4011990.9147 | 1000172.6234 | 4840841.2645 | A    |
| 65  | CRAK XXXXXXXXXXX | 3982250.8609 | 972921.7232  | 4870395.0850 | A    |
| 68  | CSUM XXXXXXXXXXX | 3931871.4757 | 1200665.4738 | 4860559.2448 | A    |
| 69  | CSVI XXXXXXXXXXX | 3959346.0619 | 1170655.8918 | 4845811.6032 | A    |
| 70  | CTAB XXXXXXXXXXX | 4022509.8301 | 1053802.0083 | 4820712.5336 | A    |
| 71  | CTRU XXXXXXXXXXX | 3904532.3030 | 1112858.2428 | 4903152.0222 | A    |
| 72  | CVSE XXXXXXXXXXX | 3960645.3163 | 1286205.4303 | 4815446.3035 | A    |
| 73  | CZBC XXXXXXXXXXX | 4031434.1774 | 1224069.8945 | 4772742.6661 | A    |
| 74  | CZBO XXXXXXXXXXX | 4084156.3355 | 1040006.6605 | 4772204.2060 | A    |
| 75  | CZBR XXXXXXXXXXX | 4001197.2644 | 1193700.6478 | 4805621.0514 | A    |
| 76  | CZBV XXXXXXXXXXX | 3894846.8515 | 1141065.2083 | 4904364.0838 | A    |
| 77  | CZBY XXXXXXXXXXX | 3920283.0782 | 1329530.4353 | 4836551.0929 | A    |
| 78  | CZCT XXXXXXXXXXX | 3947176.3092 | 1164511.6852 | 4857022.0551 | A    |
| 79  | CZHB XXXXXXXXXXX | 4041244.1201 | 1151186.5864 | 4782828.6959 | A    |
| 80  | CZHK XXXXXXXXXXX | 3933321.9093 | 1118441.1010 | 4878732.5746 | A    |
| 81  | CZHM XXXXXXXXXXX | 3919944.8936 | 1264714.7346 | 4853957.2714 | A    |
| 82  | CZKO XXXXXXXXXXX | 3962351.7016 | 1076750.0313 | 4864658.1550 | A    |
| 83  | CZKV XXXXXXXXXXX | 3985623.1750 | 908504.2044  | 4880108.2827 | A    |
| 84  | CZLT XXXXXXXXXXX | 3939062.9090 | 991697.1540  | 4901228.9745 | A    |
| 85  | CZNO XXXXXXXXXXX | 4040427.8996 | 1161565.1014 | 4780907.1868 | A    |
| 86  | CZNY XXXXXXXXXXX | 4022705.2396 | 944925.1067  | 4842783.7666 | A    |
| 87  | CZOL XXXXXXXXXXX | 3958032.1398 | 1229032.7392 | 4832192.9914 | A    |
| 88  | CZPB XXXXXXXXXXX | 4011114.2516 | 1001604.6575 | 4841292.9351 | A    |
| 89  | CZPR XXXXXXXXXXX | 3976290.2035 | 1021513.3955 | 4865179.8927 | A    |
| 90  | CZRA XXXXXXXXXXX | 3983054.6752 | 972733.4575  | 4869836.3748 | A    |
| 91  | CZRY XXXXXXXXXXX | 3908663.8623 | 1057892.2309 | 4911973.0284 | A    |
| 92  | CZSL XXXXXXXXXXX | 4043615.7630 | 1109727.1886 | 4790720.6489 | A    |
| 93  | CZST XXXXXXXXXXX | 4047980.2004 | 1002095.7375 | 4810447.5197 | A    |
| 94  | CZUB XXXXXXXXXXX | 3993467.8476 | 1270376.6921 | 4792475.2784 | A    |

|     |      |            |              |              |              |   |
|-----|------|------------|--------------|--------------|--------------|---|
| 95  | CZUH | XXXXXXXXXX | 3898307.5491 | 1193787.9570 | 4889004.6054 | A |
| 96  | CZUS | XXXXXXXXXX | 4027864.5693 | 1055545.6568 | 4815851.1680 | A |
| 97  | CZVZ | XXXXXXXXXX | 3988118.0430 | 1107932.5134 | 4837067.1836 | A |
| 104 | DRES | 14108M001  | 3904724.5410 | 954013.5586  | 4935790.0936 | A |
| 116 | GANP | 11515M001  | 3929181.3502 | 1455236.8994 | 4793654.0065 | W |
| 119 | GOPE | 11502M002  | 3979315.9759 | 1050312.6471 | 4857067.2241 | W |
| 121 | GRAZ | 11001M002  | 4194423.6493 | 1162702.8761 | 4647245.5285 | W |
| 122 | GSR1 | 14501M001  | 4292609.3399 | 1113639.4099 | 4569215.7492 | A |
| 128 | HOBU | 14202M003  | 3778219.6359 | 698635.5992  | 5074054.3247 | A |
| 139 | JOZE | 12204M001  | 3664939.9827 | 1409154.0191 | 5009571.4804 | W |
| 140 | KARL | 14216M001  | 4146524.2312 | 613138.2403  | 4791517.2985 | A |
| 145 | KLOP | 14214M002  | 4041875.2964 | 620655.4670  | 4878636.9337 | A |
| 148 | KUNZ | 11524M001  | 4037497.6295 | 1097034.4294 | 4798909.4261 | A |
| 154 | LINZ | 11033S001  | 4118898.4831 | 1048597.5367 | 4740106.0141 | A |
| 159 | LYSH | 11522M001  | 3934177.9915 | 1312357.5125 | 4831238.1540 | A |
| 164 | MARJ | 11517M001  | 3975132.5422 | 909950.7108  | 4888908.2624 | A |
| 185 | ONSA | 10402M004  | 3370658.4065 | 711877.2883  | 5349787.0718 | W |
| 192 | PENC | 11206M006  | 4052449.2983 | 1417681.3019 | 4701407.2185 | W |
| 195 | POL1 | XXXXXXXXXX | 3914079.3627 | 1146207.0844 | 4888343.0214 | A |
| 196 | POLV | 12336M001  | 3411557.1390 | 2348464.1116 | 4834396.9698 | W |
| 197 | POTS | 14106M003  | 3800689.4812 | 882077.5484  | 5028791.4308 | W |
| 198 | POUS | 11518M001  | 4002424.5340 | 872513.2022  | 4873111.8964 | A |
| 200 | PTBB | 14234M001  | 3844059.8098 | 709661.4846  | 5023129.6636 | A |
| 229 | SVTL | 12350M001  | 2730155.1763 | 1562364.8720 | 5529989.3673 | W |
| 231 | TBEN | XXXXXXXXXX | 3992164.9865 | 1045990.6863 | 4847278.2168 | A |
| 233 | TBRN | XXXXXXXXXX | 4000657.3621 | 1195481.8080 | 4805612.6512 | A |
| 234 | TCBU | XXXXXXXXXX | 4061267.8097 | 1049763.7288 | 4789143.9535 | A |
| 235 | TCHM | XXXXXXXXXX | 3958227.8059 | 943093.9902  | 4895641.7303 | A |
| 240 | TJES | XXXXXXXXXX | 3940251.7835 | 1273001.1994 | 4835386.7224 | A |
| 241 | TKRN | XXXXXXXXXX | 3906542.2681 | 1245513.8872 | 4869623.0811 | A |
| 243 | TLUB | XXXXXXXXXX | 3991598.1281 | 878173.7118  | 4880936.6775 | A |
| 244 | TMIL | XXXXXXXXXX | 4025494.9832 | 1031912.6791 | 4822953.4450 | A |
| 245 | TMLA | XXXXXXXXXX | 3951447.9024 | 1177116.9122 | 4850617.1064 | A |
| 246 | TNYM | XXXXXXXXXX | 3951156.2388 | 1063109.7125 | 4876647.5557 | A |
| 249 | TPLA | XXXXXXXXXX | 4018660.0933 | 907818.3372  | 4853353.9765 | A |
| 250 | TPOD | XXXXXXXXXX | 4026474.9221 | 1219275.6683 | 4778133.6539 | A |
| 251 | TPRA | XXXXXXXXXX | 3968103.4270 | 1023533.8334 | 4871446.7611 | A |
| 253 | TRAK | XXXXXXXXXX | 3981965.9591 | 972837.6902  | 4870641.5973 | A |
| 254 | TRAT | XXXXXXXXXX | 4012020.2386 | 1238919.9571 | 4785234.1262 | A |
| 256 | TRNK | XXXXXXXXXX | 3929946.0679 | 1147028.7440 | 4874940.5955 | A |
| 259 | TRYN | XXXXXXXXXX | 4013477.4066 | 1092813.6687 | 4819655.1860 | A |
| 260 | TSEC | XXXXXXXXXX | 3968820.1491 | 1111804.9409 | 4851986.5040 | A |
| 261 | TSLU | XXXXXXXXXX | 3894883.9076 | 1004403.6541 | 4933867.1804 | A |
| 263 | TSUS | XXXXXXXXXX | 4056131.1342 | 976727.5143  | 4808866.2809 | A |
| 264 | TTRE | XXXXXXXXXX | 4016299.7681 | 1142456.6332 | 4805816.3592 | A |
| 265 | TTUR | XXXXXXXXXX | 3916932.7705 | 1059508.6741 | 4904849.1778 | A |
| 267 | TUBO | 11503M001  | 4001470.1200 | 1192345.7054 | 4805795.6336 | A |
| 269 | TUPI | XXXXXXXXXX | 3907111.7636 | 1121153.6202 | 4899218.6855 | A |
| 270 | TVID | XXXXXXXXXX | 3894198.9252 | 1204371.7725 | 4889574.2795 | A |
| 271 | TZAL | XXXXXXXXXX | 3940857.9205 | 989527.3315  | 4900210.1596 | A |
| 272 | TZD2 | XXXXXXXXXX | 3986175.3152 | 1138778.0722 | 4831679.6514 | A |
| 274 | TZLI | XXXXXXXXXX | 3976492.0046 | 1267580.2794 | 4807221.0891 | A |
| 275 | TZNO | XXXXXXXXXX | 4040134.7921 | 1162174.1790 | 4780963.4991 | A |
| 279 | UZHL | 12301M001  | 3907587.2820 | 1602428.8607 | 4763783.8570 | A |
| 281 | VACO | 11516M001  | 4062325.7177 | 992104.8057  | 4800911.3815 | A |
| 291 | VSBO | 11521M001  | 3916835.7837 | 1285051.4902 | 4851126.2222 | A |
| 294 | WROC | 12217M001  | 3835751.1339 | 1177250.1223 | 4941605.3501 | W |
| 296 | WTZR | 14201M010  | 4075580.3931 | 931853.9758  | 4801568.2461 | W |
| 302 | ZOUF | 12763M001  | 4282709.8855 | 986659.6297  | 4609469.9276 | A |

|     |      |            |              |              |              |   |
|-----|------|------------|--------------|--------------|--------------|---|
| 305 | TPR2 | XXXXXXXXXX | 3969160.9410 | 1221946.5246 | 4824928.5900 | A |
| 306 | STAM | XXXXXXXXXX | 3916585.6196 | 1193517.3438 | 4874839.5042 | A |
| 307 | CJES | XXXXXXXXXX | 3905299.8836 | 1209502.7653 | 4879776.1493 | A |
| 308 | HABA | XXXXXXXXXX | 3994592.5041 | 889407.5244  | 4876465.4118 | A |
| 309 | KYNS | XXXXXXXXXX | 4000584.8210 | 891012.8143  | 4871284.0084 | A |
| 310 | LITO | XXXXXXXXXX | 3938495.2265 | 992556.6557  | 4901523.2655 | A |
| 313 | TPRA | XXXXXXXXXX | 3968103.4270 | 1023533.8334 | 4871446.7611 | A |
| 316 | CBUD | XXXXXXXXXX | 4062268.0666 | 1048704.1467 | 4788540.8005 | A |
| 319 | CZNB | XXXXXXXXXX | 3912867.7348 | 1015833.6064 | 4917386.8290 | A |
| 320 | CZRV | XXXXXXXXXX | 3928778.2174 | 1221707.7737 | 4858213.1079 | A |
| 321 | CZVM | XXXXXXXXXX | 4002122.8922 | 1147609.4420 | 4816362.4519 | A |
| 322 | CZVS | XXXXXXXXXX | 3947798.3134 | 1053995.8346 | 4881314.0899 | A |
| 323 | CZZA | XXXXXXXXXX | 3947465.7278 | 1285780.0657 | 4826309.0115 | A |
| 324 | PLZN | XXXXXXXXXX | 4019718.6947 | 954062.4074  | 4843509.8461 | A |

## Příloha 2: souřadnice z kampaně 5/2015 v ETRF2000(R05) přímá trn.

cat C156\_01-E05-sel.CRD

COMPUTED FROM FILE: C156\_01.CRD (ETRF2000-R05)

-----  
 LOCAL GEODETIC DATUM: ETRF2000                      EPOCH: 2015-05-01 0:00:00

| NUM | STATION NAME | X (M)      | Y (M)        | Z (M)        | FLAG         |   |
|-----|--------------|------------|--------------|--------------|--------------|---|
| 16  | BEZD         | XXXXXXXXXX | 3902726.7849 | 1136008.0795 | 4899383.8600 | A |
| 17  | BISK         | 11520M001  | 3898946.2639 | 1223993.1357 | 4881826.2456 | A |
| 19  | BOGO         | 12207M002  | 3633739.3132 | 1397433.9255 | 5035353.2966 | W |
| 21  | BOR1         | 12205M002  | 3738358.7746 | 1148173.4940 | 5021815.5769 | W |
| 30  | BZRG         | 12751M001  | 4312657.7743 | 864634.4116  | 4603844.2359 | A |
| 38  | CDAC         | XXXXXXXXXX | 4035070.7702 | 1114231.9197 | 4796778.8819 | A |
| 40  | CDOM         | XXXXXXXXXX | 4049956.5013 | 929357.2484  | 4823342.0365 | A |
| 42  | CFRM         | XXXXXXXXXX | 3924573.1714 | 1301971.0033 | 4840464.4920 | A |
| 44  | CHOD         | XXXXXXXXXX | 4018665.5071 | 1238534.9655 | 4779742.5726 | A |
| 45  | CHOT         | XXXXXXXXXX | 3979115.3606 | 1116429.7165 | 4842574.8254 | A |
| 46  | CJIH         | XXXXXXXXXX | 4006713.0737 | 1117668.9385 | 4819597.7453 | A |
| 48  | CKRO         | XXXXXXXXXX | 3976868.6618 | 1246285.9755 | 4812394.6712 | A |
| 49  | CKVA         | XXXXXXXXXX | 3986037.0377 | 908669.5268  | 4879721.6179 | A |
| 51  | CLIB         | XXXXXXXXXX | 3903195.5250 | 1050232.2497 | 4917869.6408 | A |
| 52  | CLIT         | XXXXXXXXXX | 3938730.3361 | 992282.7087  | 4901388.8312 | A |
| 54  | CMBO         | XXXXXXXXXX | 3935718.6776 | 1047652.4761 | 4892416.4167 | A |
| 59  | CPAR         | XXXXXXXXXX | 3949919.0795 | 1116467.0417 | 4865832.5385 | A |
| 60  | CPRA         | XXXXXXXXXX | 4067219.5753 | 1013765.4722 | 4792089.1584 | A |
| 61  | CPRG         | XXXXXXXXXX | 3967685.5034 | 1022867.3237 | 4872004.1798 | A |
| 63  | CPRI         | XXXXXXXXXX | 4011991.3761 | 1000172.2211 | 4840840.9504 | A |
| 65  | CRAK         | XXXXXXXXXX | 3982251.3214 | 972921.3235  | 4870394.7725 | A |
| 68  | CSUM         | XXXXXXXXXX | 3931871.9585 | 1200665.0797 | 4860558.9378 | A |
| 69  | CSVI         | XXXXXXXXXX | 3959346.5408 | 1170655.4950 | 4845811.2942 | A |
| 70  | CTAB         | XXXXXXXXXX | 4022510.2957 | 1053801.6052 | 4820712.2194 | A |
| 71  | CTRU         | XXXXXXXXXX | 3904532.7795 | 1112857.8509 | 4903151.7161 | A |
| 72  | CVSE         | XXXXXXXXXX | 3960645.8050 | 1286205.0339 | 4815445.9955 | A |
| 73  | CZBC         | XXXXXXXXXX | 4031434.6572 | 1224069.4913 | 4772742.3530 | A |
| 74  | CZBO         | XXXXXXXXXX | 4084156.7968 | 1040006.2516 | 4772203.8877 | A |
| 75  | CZBR         | XXXXXXXXXX | 4001197.7432 | 1193700.2472 | 4805620.7399 | A |
| 76  | CZBV         | XXXXXXXXXX | 3894847.3310 | 1141064.8174 | 4904363.7786 | A |
| 77  | CZBY         | XXXXXXXXXX | 3920283.5725 | 1329530.0428 | 4836550.7879 | A |
| 78  | CZCT         | XXXXXXXXXX | 3947176.7882 | 1164511.2895 | 4857021.7468 | A |
| 79  | CZHB         | XXXXXXXXXX | 4041244.5932 | 1151186.1820 | 4782828.3814 | A |
| 80  | CZHK         | XXXXXXXXXX | 3933322.3849 | 1118440.7064 | 4878732.2667 | A |

|     |      |            |              |              |              |   |
|-----|------|------------|--------------|--------------|--------------|---|
| 81  | CZHM | XXXXXXXXXX | 3919945.3824 | 1264714.3419 | 4853956.9658 | A |
| 82  | CZKO | XXXXXXXXXX | 3962352.1722 | 1076749.6339 | 4864657.8448 | A |
| 83  | CZKV | XXXXXXXXXX | 3985623.6296 | 908503.8042  | 4880107.9694 | A |
| 84  | CZLT | XXXXXXXXXX | 3939063.3732 | 991696.7584  | 4901228.6650 | A |
| 85  | CZNO | XXXXXXXXXX | 4040428.3736 | 1161564.6971 | 4780906.8725 | A |
| 86  | CZNY | XXXXXXXXXX | 4022705.6956 | 944924.7032  | 4842783.4513 | A |
| 87  | CZOL | XXXXXXXXXX | 3958032.6237 | 1229032.3428 | 4832192.6830 | A |
| 88  | CZPB | XXXXXXXXXX | 4011114.7132 | 1001604.2553 | 4841292.6211 | A |
| 89  | CZPR | XXXXXXXXXX | 3976290.6686 | 1021512.9966 | 4865179.5811 | A |
| 90  | CZRA | XXXXXXXXXX | 3983055.1356 | 972733.0577  | 4869836.0623 | A |
| 91  | CZRY | XXXXXXXXXX | 3908664.3338 | 1057891.8384 | 4911972.7215 | A |
| 92  | CZSL | XXXXXXXXXX | 4043616.2324 | 1109726.7838 | 4790720.3339 | A |
| 93  | CZST | XXXXXXXXXX | 4047980.6602 | 1002095.3318 | 4810447.2033 | A |
| 94  | CZUB | XXXXXXXXXX | 3993468.3333 | 1270376.2926 | 4792474.9682 | A |
| 95  | CZUH | XXXXXXXXXX | 3898308.0329 | 1193787.5660 | 4889004.3005 | A |
| 96  | CZUJ | XXXXXXXXXX | 4027865.0348 | 1055545.2532 | 4815850.8534 | A |
| 97  | CZVZ | XXXXXXXXXX | 3988118.5150 | 1107932.1137 | 4837066.8721 | A |
| 104 | DRES | 14108M001  | 3904725.0035 | 954013.1661  | 4935789.7859 | A |
| 116 | GANP | 11515M001  | 3929181.8545 | 1455236.5067 | 4793653.7022 | W |
| 119 | GOPE | 11502M002  | 3979316.4434 | 1050312.2480 | 4857066.9126 | W |
| 121 | GRAZ | 11001M002  | 4194424.1153 | 1162702.4576 | 4647245.2044 | W |
| 122 | GSR1 | 14501M001  | 4292609.7963 | 1113638.9822 | 4569215.4183 | A |
| 128 | HOBU | 14202M003  | 3778220.0811 | 698635.2176  | 5074054.0225 | A |
| 139 | JOZE | 12204M001  | 3664940.4955 | 1409153.6508 | 5009571.1925 | W |
| 140 | KARL | 14216M001  | 4146524.6506 | 613137.8242  | 4791516.9719 | A |
| 145 | KLOP | 14214M002  | 4041875.7219 | 620655.0606  | 4878636.6139 | A |
| 148 | KUNZ | 11524M001  | 4037498.0981 | 1097034.0251 | 4798909.1113 | A |
| 154 | LINZ | 11033S001  | 4118898.9433 | 1048597.1247 | 4740105.6937 | A |
| 159 | LYSH | 11522M001  | 3934178.4838 | 1312357.1186 | 4831237.8480 | A |
| 164 | MARJ | 11517M001  | 3975132.9975 | 909950.3115  | 4888907.9498 | A |
| 185 | ONSA | 10402M004  | 3370658.8696 | 711876.9451  | 5349786.7957 | W |
| 192 | PENC | 11206M006  | 4052449.7933 | 1417680.8976 | 4701406.9060 | W |
| 195 | POL1 | XXXXXXXXXX | 3914079.8417 | 1146206.6917 | 4888342.7150 | A |
| 196 | POLV | 12336M001  | 3411557.7354 | 2348463.7722 | 4834396.7072 | W |
| 197 | POTS | 14106M003  | 3800689.9421 | 882077.1653  | 5028791.1290 | W |
| 198 | POUS | 11518M001  | 4002424.9845 | 872512.8003  | 4873111.5816 | A |
| 200 | PTBB | 14234M001  | 3844060.2530 | 709661.0969  | 5023129.3573 | A |
| 229 | SVTL | 12350M001  | 2730155.7356 | 1562364.5930 | 5529989.1403 | W |
| 231 | TBEN | XXXXXXXXXX | 3992165.4529 | 1045990.2860 | 4847277.9044 | A |
| 233 | TBRN | XXXXXXXXXX | 4000657.8411 | 1195481.4075 | 4805612.3398 | A |
| 234 | TCBU | XXXXXXXXXX | 4061268.2730 | 1049763.3221 | 4789143.6367 | A |
| 235 | TCHM | XXXXXXXXXX | 3958228.2649 | 943093.5926  | 4895641.4191 | A |
| 240 | TJES | XXXXXXXXXX | 3940252.2721 | 1273000.8048 | 4835386.4156 | A |
| 241 | TKRN | XXXXXXXXXX | 3906542.7560 | 1245513.4956 | 4869622.7762 | A |
| 243 | TLUB | XXXXXXXXXX | 3991598.5797 | 878173.3109  | 4880936.3635 | A |
| 244 | TMIL | XXXXXXXXXX | 4025495.4467 | 1031912.2756 | 4822953.1304 | A |
| 245 | TMLA | XXXXXXXXXX | 3951448.3822 | 1177116.5162 | 4850616.7979 | A |
| 246 | TNYM | XXXXXXXXXX | 3951156.7087 | 1063109.3160 | 4876647.2461 | A |
| 249 | TPLA | XXXXXXXXXX | 4018660.5462 | 907817.9339  | 4853353.6610 | A |
| 250 | TPOD | XXXXXXXXXX | 4026475.4018 | 1219275.2655 | 4778133.3411 | A |
| 251 | TPRA | XXXXXXXXXX | 3968103.8926 | 1023533.4352 | 4871446.4500 | A |
| 253 | TRAK | XXXXXXXXXX | 3981966.4196 | 972837.2905  | 4870641.2848 | A |
| 254 | TRAT | XXXXXXXXXX | 4012020.7207 | 1238919.5557 | 4785233.8145 | A |
| 256 | TRNK | XXXXXXXXXX | 3929946.5462 | 1147028.3498 | 4874940.2881 | A |
| 259 | TRYN | XXXXXXXXXX | 4013477.8761 | 1092813.2666 | 4819654.8727 | A |
| 260 | TSEC | XXXXXXXXXX | 3968820.6224 | 1111804.5430 | 4851986.1938 | A |
| 261 | TSLU | XXXXXXXXXX | 3894884.3751 | 1004403.2626 | 4933866.8738 | A |
| 263 | TSUS | XXXXXXXXXX | 4056131.5913 | 976727.1078  | 4808865.9637 | A |
| 264 | TTRE | XXXXXXXXXX | 4016300.2417 | 1142456.2310 | 4805816.0462 | A |



|     |      |            |              |              |              |   |
|-----|------|------------|--------------|--------------|--------------|---|
| 265 | TTUR | XXXXXXXXXX | 3916933.2418 | 1059508.2808 | 4904848.8704 | A |
| 267 | TUBO | 11503M001  | 4001470.5986 | 1192345.3048 | 4805795.3221 | A |
| 269 | TUPI | XXXXXXXXXX | 3907112.2407 | 1121153.2281 | 4899218.3793 | A |
| 270 | TVID | XXXXXXXXXX | 3894199.4101 | 1204371.3819 | 4889573.9750 | A |
| 271 | TZAL | XXXXXXXXXX | 3940858.3845 | 989526.9357  | 4900209.8499 | A |
| 272 | TZD2 | XXXXXXXXXX | 3986175.7900 | 1138777.6728 | 4831679.3403 | A |
| 274 | TZLI | XXXXXXXXXX | 3976492.4909 | 1267579.8814 | 4807220.7799 | A |
| 275 | TZNO | XXXXXXXXXX | 4040135.2662 | 1162173.7747 | 4780963.1848 | A |
| 279 | UZHL | 12301M001  | 3907587.7993 | 1602428.4707 | 4763783.5555 | A |
| 281 | VACO | 11516M001  | 4062326.1759 | 992104.3987  | 4800911.0641 | A |
| 291 | VSBO | 11521M001  | 3916836.2744 | 1285051.0978 | 4851125.9170 | A |
| 294 | WROC | 12217M001  | 3835751.6192 | 1177249.7370 | 4941605.0490 | W |
| 296 | WTZR | 14201M010  | 4075580.8453 | 931853.5673  | 4801567.9273 | W |
| 302 | ZOUF | 12763M001  | 4282710.3315 | 986659.2024  | 4609469.5961 | A |
| 305 | TPR2 | XXXXXXXXXX | 3969161.4238 | 1221946.1271 | 4824928.2808 | A |
| 306 | STAM | XXXXXXXXXX | 3916586.1025 | 1193516.9511 | 4874839.1981 | A |
| 307 | CJES | XXXXXXXXXX | 3905300.3685 | 1209502.3737 | 4879775.8441 | A |
| 308 | HABA | XXXXXXXXXX | 3994592.9565 | 889407.1233  | 4876465.0977 | A |
| 309 | KYNS | XXXXXXXXXX | 4000585.2733 | 891012.4126  | 4871283.6939 | A |
| 310 | LITO | XXXXXXXXXX | 3938495.6908 | 992556.2602  | 4901522.9560 | A |
| 313 | TPRA | XXXXXXXXXX | 3968103.8926 | 1023533.4352 | 4871446.4500 | A |
| 316 | CBUD | XXXXXXXXXX | 4062268.5297 | 1048703.7399 | 4788540.4837 | A |
| 319 | CZNB | XXXXXXXXXX | 3912868.2024 | 1015833.2133 | 4917386.5214 | A |
| 320 | CZRV | XXXXXXXXXX | 3928778.7022 | 1221707.3800 | 4858212.8013 | A |
| 321 | CZVM | XXXXXXXXXX | 4002123.3670 | 1147609.0412 | 4816362.1399 | A |
| 322 | CZVS | XXXXXXXXXX | 3947798.7827 | 1053995.4384 | 4881313.7804 | A |
| 323 | CZZA | XXXXXXXXXX | 3947466.2171 | 1285779.6705 | 4826308.7044 | A |
| 324 | PLZN | XXXXXXXXXX | 4019719.1516 | 954062.0042  | 4843509.5310 | A |
| 313 | TPRA | XXXXXXXXXX | 3968103.8926 | 1023533.4352 | 4871446.4500 | A |

**Příloha 3 C1501\_ETCZ.CRD: souřadnice z kampaně 1/2015 v ETRF2000, národní realizace (transformováno na souřadnice stanic CZEPOS z kampaně EUREF CZECH 09 a korekce části sítě po obměně stanic v letech 2011-13)**

cat C156\_ETCZ.CRD

COMPUTED FROM FILE: C156\_01.CRD (ETRS89-CZ)

-----

LOCAL GEODETIC DATUM: ETRS89                                EPOCH: 2015-05-01 0:00:00

| NUM | STATION NAME | X (M)      | Y (M)        | Z (M)        | FLAG         |   |
|-----|--------------|------------|--------------|--------------|--------------|---|
| 16  | BEZD         | XXXXXXXXXX | 3902726.7854 | 1136008.0832 | 4899383.8591 | A |
| 17  | BISK         | 11520M001  | 3898946.2644 | 1223993.1394 | 4881826.2447 | A |
| 19  | BOGO         | 12207M002  | 3633739.3137 | 1397433.9292 | 5035353.2957 | W |
| 21  | BOR1         | 12205M002  | 3738358.7751 | 1148173.4977 | 5021815.5760 | W |
| 30  | BZRG         | 12751M001  | 4312657.7748 | 864634.4153  | 4603844.2350 | A |
| 38  | CDAC         | XXXXXXXXXX | 4035070.7707 | 1114231.9234 | 4796778.8810 | A |
| 40  | CDOM         | XXXXXXXXXX | 4049956.5018 | 929357.2521  | 4823342.0356 | A |
| 42  | CFRM         | XXXXXXXXXX | 3924573.1719 | 1301971.0070 | 4840464.4911 | A |
| 44  | CHOD         | XXXXXXXXXX | 4018665.5076 | 1238534.9692 | 4779742.5717 | A |
| 45  | CHOT         | XXXXXXXXXX | 3979115.3611 | 1116429.7202 | 4842574.8245 | A |
| 46  | CJIH         | XXXXXXXXXX | 4006713.0742 | 1117668.9422 | 4819597.7444 | A |
| 48  | CKRO         | XXXXXXXXXX | 3976868.6623 | 1246285.9792 | 4812394.6703 | A |
| 49  | CKVA         | XXXXXXXXXX | 3986037.0382 | 908669.5305  | 4879721.6170 | A |
| 51  | CLIB         | XXXXXXXXXX | 3903195.5255 | 1050232.2534 | 4917869.6399 | A |
| 52  | CLIT         | XXXXXXXXXX | 3938730.3366 | 992282.7124  | 4901388.8303 | A |
| 54  | CMBO         | XXXXXXXXXX | 3935718.6781 | 1047652.4798 | 4892416.4158 | A |
| 59  | CPAR         | XXXXXXXXXX | 3949919.0800 | 1116467.0454 | 4865832.5376 | A |

|     |      |            |              |              |              |   |
|-----|------|------------|--------------|--------------|--------------|---|
| 60  | CPRA | XXXXXXXXXX | 4067219.5758 | 1013765.4759 | 4792089.1575 | A |
| 61  | CPRG | XXXXXXXXXX | 3967685.5039 | 1022867.3274 | 4872004.1789 | A |
| 63  | CPRI | XXXXXXXXXX | 4011991.3766 | 1000172.2248 | 4840840.9495 | A |
| 65  | CRAK | XXXXXXXXXX | 3982251.3219 | 972921.3272  | 4870394.7716 | A |
| 68  | CSUM | XXXXXXXXXX | 3931871.9590 | 1200665.0834 | 4860558.9369 | A |
| 69  | CSVI | XXXXXXXXXX | 3959346.5413 | 1170655.4987 | 4845811.2933 | A |
| 70  | CTAB | XXXXXXXXXX | 4022510.2962 | 1053801.6089 | 4820712.2185 | A |
| 71  | CTRU | XXXXXXXXXX | 3904532.7800 | 1112857.8546 | 4903151.7152 | A |
| 72  | CVSE | XXXXXXXXXX | 3960645.8055 | 1286205.0376 | 4815445.9946 | A |
| 73  | CZBC | XXXXXXXXXX | 4031434.6577 | 1224069.4950 | 4772742.3521 | A |
| 74  | CZBO | XXXXXXXXXX | 4084156.7973 | 1040006.2553 | 4772203.8868 | A |
| 75  | CZBR | XXXXXXXXXX | 4001197.7437 | 1193700.2509 | 4805620.7390 | A |
| 76  | CZBV | XXXXXXXXXX | 3894847.3315 | 1141064.8211 | 4904363.7777 | A |
| 77  | CZBY | XXXXXXXXXX | 3920283.5730 | 1329530.0465 | 4836550.7870 | A |
| 78  | CZCT | XXXXXXXXXX | 3947176.7887 | 1164511.2932 | 4857021.7459 | A |
| 79  | CZHB | XXXXXXXXXX | 4041244.5937 | 1151186.1857 | 4782828.3805 | A |
| 80  | CZHK | XXXXXXXXXX | 3933322.3854 | 1118440.7101 | 4878732.2658 | A |
| 81  | CZHM | XXXXXXXXXX | 3919945.3829 | 1264714.3456 | 4853956.9649 | A |
| 82  | CZKO | XXXXXXXXXX | 3962352.1727 | 1076749.6376 | 4864657.8439 | A |
| 83  | CZKV | XXXXXXXXXX | 3985623.6301 | 908503.8079  | 4880107.9685 | A |
| 84  | CZLT | XXXXXXXXXX | 3939063.3737 | 991696.7621  | 4901228.6641 | A |
| 85  | CZNO | XXXXXXXXXX | 4040428.3741 | 1161564.7008 | 4780906.8716 | A |
| 86  | CZNY | XXXXXXXXXX | 4022705.6961 | 944924.7069  | 4842783.4504 | A |
| 87  | CZOL | XXXXXXXXXX | 3958032.6242 | 1229032.3465 | 4832192.6821 | A |
| 88  | CZPB | XXXXXXXXXX | 4011114.7137 | 1001604.2590 | 4841292.6202 | A |
| 89  | CZPR | XXXXXXXXXX | 3976290.6691 | 1021513.0003 | 4865179.5802 | A |
| 90  | CZRA | XXXXXXXXXX | 3983055.1361 | 972733.0614  | 4869836.0614 | A |
| 91  | CZRY | XXXXXXXXXX | 3908664.3343 | 1057891.8421 | 4911972.7206 | A |
| 92  | CZSL | XXXXXXXXXX | 4043616.2329 | 1109726.7875 | 4790720.3330 | A |
| 93  | CZST | XXXXXXXXXX | 4047980.6607 | 1002095.3355 | 4810447.2024 | A |
| 94  | CZUB | XXXXXXXXXX | 3993468.3338 | 1270376.2963 | 4792474.9673 | A |
| 95  | CZUH | XXXXXXXXXX | 3898308.0334 | 1193787.5697 | 4889004.2996 | A |
| 96  | CZUS | XXXXXXXXXX | 4027865.0353 | 1055545.2569 | 4815850.8525 | A |
| 97  | CZVZ | XXXXXXXXXX | 3988118.5155 | 1107932.1174 | 4837066.8712 | A |
| 104 | DRES | 14108M001  | 3904725.0040 | 954013.1698  | 4935789.7850 | A |
| 116 | GANP | 11515M001  | 3929181.8550 | 1455236.5104 | 4793653.7013 | W |
| 119 | GOPE | 11502M002  | 3979316.4439 | 1050312.2517 | 4857066.9117 | W |
| 121 | GRAZ | 11001M002  | 4194424.1158 | 1162702.4613 | 4647245.2035 | W |
| 122 | GSR1 | 14501M001  | 4292609.7968 | 1113638.9859 | 4569215.4174 | A |
| 128 | HOBU | 14202M003  | 3778220.0816 | 698635.2213  | 5074054.0216 | A |
| 139 | JOZE | 12204M001  | 3664940.4960 | 1409153.6545 | 5009571.1916 | W |
| 140 | KARL | 14216M001  | 4146524.6511 | 613137.8279  | 4791516.9710 | A |
| 145 | KLOP | 14214M002  | 4041875.7224 | 620655.0643  | 4878636.6130 | A |
| 148 | KUNZ | 11524M001  | 4037498.0986 | 1097034.0288 | 4798909.1104 | A |
| 154 | LINZ | 11033S001  | 4118898.9438 | 1048597.1284 | 4740105.6928 | A |
| 159 | LYSH | 11522M001  | 3934178.4843 | 1312357.1223 | 4831237.8471 | A |
| 164 | MARJ | 11517M001  | 3975132.9980 | 909950.3152  | 4888907.9489 | A |
| 185 | ONSA | 10402M004  | 3370658.8701 | 711876.9488  | 5349786.7948 | W |
| 192 | PENC | 11206M006  | 4052449.7938 | 1417680.9013 | 4701406.9051 | W |
| 195 | POL1 | XXXXXXXXXX | 3914079.8422 | 1146206.6954 | 4888342.7141 | A |
| 196 | POLV | 12336M001  | 3411557.7359 | 2348463.7759 | 4834396.7063 | W |
| 197 | POTS | 14106M003  | 3800689.9426 | 882077.1690  | 5028791.1281 | W |
| 198 | POUS | 11518M001  | 4002424.9850 | 872512.8040  | 4873111.5807 | A |
| 200 | PTBB | 14234M001  | 3844060.2535 | 709661.1006  | 5023129.3564 | A |
| 229 | SVTL | 12350M001  | 2730155.7361 | 1562364.5967 | 5529989.1394 | W |
| 231 | TBEN | XXXXXXXXXX | 3992165.4534 | 1045990.2897 | 4847277.9035 | A |
| 233 | TBRN | XXXXXXXXXX | 4000657.8416 | 1195481.4112 | 4805612.3389 | A |
| 234 | TCBU | XXXXXXXXXX | 4061268.2735 | 1049763.3258 | 4789143.6358 | A |
| 235 | TCHM | XXXXXXXXXX | 3958228.2654 | 943093.5963  | 4895641.4182 | A |

|     |      |            |              |              |              |   |
|-----|------|------------|--------------|--------------|--------------|---|
| 240 | TJES | XXXXXXXXXX | 3940252.2726 | 1273000.8085 | 4835386.4147 | A |
| 241 | TKRN | XXXXXXXXXX | 3906542.7565 | 1245513.4993 | 4869622.7753 | A |
| 243 | TLUB | XXXXXXXXXX | 3991598.5802 | 878173.3146  | 4880936.3626 | A |
| 244 | TMIL | XXXXXXXXXX | 4025495.4472 | 1031912.2793 | 4822953.1295 | A |
| 245 | TMLA | XXXXXXXXXX | 3951448.3827 | 1177116.5199 | 4850616.7970 | A |
| 246 | TNYM | XXXXXXXXXX | 3951156.7092 | 1063109.3197 | 4876647.2452 | A |
| 249 | TPLA | XXXXXXXXXX | 4018660.5467 | 907817.9376  | 4853353.6601 | A |
| 250 | TPOD | XXXXXXXXXX | 4026475.4023 | 1219275.2692 | 4778133.3402 | A |
| 251 | TPRA | XXXXXXXXXX | 3968103.8931 | 1023533.4389 | 4871446.4491 | A |
| 253 | TRAK | XXXXXXXXXX | 3981966.4201 | 972837.2942  | 4870641.2839 | A |
| 254 | TRAT | XXXXXXXXXX | 4012020.7212 | 1238919.5594 | 4785233.8136 | A |
| 256 | TRNK | XXXXXXXXXX | 3929946.5467 | 1147028.3535 | 4874940.2872 | A |
| 259 | TRYN | XXXXXXXXXX | 4013477.8766 | 1092813.2703 | 4819654.8718 | A |
| 260 | TSEC | XXXXXXXXXX | 3968820.6229 | 1111804.5467 | 4851986.1929 | A |
| 261 | TSLU | XXXXXXXXXX | 3894884.3756 | 1004403.2663 | 4933866.8729 | A |
| 263 | TSUS | XXXXXXXXXX | 4056131.5918 | 976727.1115  | 4808865.9628 | A |
| 264 | TTRE | XXXXXXXXXX | 4016300.2422 | 1142456.2347 | 4805816.0453 | A |
| 265 | TTUR | XXXXXXXXXX | 3916933.2423 | 1059508.2845 | 4904848.8695 | A |
| 267 | TUBO | 11503M001  | 4001470.5991 | 1192345.3085 | 4805795.3212 | A |
| 269 | TUPI | XXXXXXXXXX | 3907112.2412 | 1121153.2318 | 4899218.3784 | A |
| 270 | TVID | XXXXXXXXXX | 3894199.4106 | 1204371.3856 | 4889573.9741 | A |
| 271 | TZAL | XXXXXXXXXX | 3940858.3850 | 989526.9394  | 4900209.8490 | A |
| 272 | TZD2 | XXXXXXXXXX | 3986175.7905 | 1138777.6765 | 4831679.3394 | A |
| 274 | TZLI | XXXXXXXXXX | 3976492.4914 | 1267579.8851 | 4807220.7790 | A |
| 275 | TZNO | XXXXXXXXXX | 4040135.2667 | 1162173.7784 | 4780963.1839 | A |
| 279 | UZHL | 12301M001  | 3907587.7998 | 1602428.4744 | 4763783.5546 | A |
| 281 | VACO | 11516M001  | 4062326.1764 | 992104.4024  | 4800911.0632 | A |
| 291 | VSBO | 11521M001  | 3916836.2749 | 1285051.1015 | 4851125.9161 | A |
| 294 | WROC | 12217M001  | 3835751.6197 | 1177249.7407 | 4941605.0481 | W |
| 296 | WTZR | 14201M010  | 4075580.8458 | 931853.5710  | 4801567.9264 | W |
| 302 | ZOUF | 12763M001  | 4282710.3320 | 986659.2061  | 4609469.5952 | A |
| 305 | TPR2 | XXXXXXXXXX | 3969161.4243 | 1221946.1308 | 4824928.2799 | A |
| 306 | STAM | XXXXXXXXXX | 3916586.1030 | 1193516.9548 | 4874839.1972 | A |
| 307 | CJES | XXXXXXXXXX | 3905300.3690 | 1209502.3774 | 4879775.8432 | A |
| 308 | HABA | XXXXXXXXXX | 3994592.9570 | 889407.1270  | 4876465.0968 | A |
| 309 | KYNS | XXXXXXXXXX | 4000585.2738 | 891012.4163  | 4871283.6930 | A |
| 310 | LITO | XXXXXXXXXX | 3938495.6913 | 992556.2639  | 4901522.9551 | A |
| 313 | TPRA | XXXXXXXXXX | 3968103.8931 | 1023533.4389 | 4871446.4491 | A |
| 316 | CBUD | XXXXXXXXXX | 4062268.5302 | 1048703.7436 | 4788540.4828 | A |
| 319 | CZNB | XXXXXXXXXX | 3912868.2029 | 1015833.2170 | 4917386.5205 | A |
| 320 | CZRV | XXXXXXXXXX | 3928778.7027 | 1221707.3837 | 4858212.8004 | A |
| 321 | CZVM | XXXXXXXXXX | 4002123.3675 | 1147609.0449 | 4816362.1390 | A |
| 322 | CZVS | XXXXXXXXXX | 3947798.7832 | 1053995.4421 | 4881313.7795 | A |
| 323 | CZZA | XXXXXXXXXX | 3947466.2176 | 1285779.6742 | 4826308.7035 | A |
| 324 | PLZN | XXXXXXXXXX | 4019719.1521 | 954062.0079  | 4843509.5301 | A |
| 313 | TPRA | XXXXXXXXXX | 3968103.8931 | 1023533.4389 | 4871446.4491 | A |