Network and Engineering Working Group Report
Meeting Tuesday 28th November 2014

Chair: G. Kirchner, Co-Chair: M. Wilkinson

The NEWG met at the 19th ILRS Workshop in Annapolis, USA. Below is a summary.

Range Bias

It was decided that the majority of the NEWG meeting time would be devoted to discussing range bias and its possible causes at the observation level at stations. Already a hot topic, it was again brought to our attention earlier in the day through a presentation by Graham Appleby (http://cddis.gsfc.nasa.gov/lw19/docs/2014/Presentations/3052_Appleby_presentation.pdf) who showed that all stations have detectable range biases in their historical data.

Matt began the discussion by posing a few questions. He asked what stations are doing to address mm level sources of error in their data? and can stations always give a satisfactory explanation of the causes of range bias? Do stations have the tools they need to detect range bias in their data? and what is the role of the NEWG in helping to eliminate range bias?

Toshi Otsubo agreed to present his work featured as a poster at the Workshop (http://cddis.gsfc.nasa.gov/lw19/docs/2014/Posters/3141_Otsubo_poster.pdf) titled 'Systematic Range Error 2013-2014'. Toshi gave examples of range bias issues at stations that were noticeable through plotting range residual against:

- Single-shot returns per NP bin
- Single-shot RMS in a NP bin
- System delay (calibration)
- Time to the nearest calibration
- Range rate
- Time of day

It was agreed that these plots by Toshi were extremely useful to stations and the NEWG was grateful to him for his work.

The discussion was then opened up to the floor and participants were encouraged to share their experiences. Systematic errors at the few mm-level are going to be difficult to detect and in many of the problems described the errors were able to persist for long periods before being detected and resolved.

In some cases calibrations could be better and carried out more often. Clement Courde suggested that one-way calibrations could be useful in seeing systematic errors. Chris Moore asked what the ILRS standards for met devices were. Ludwig Grunwaldt suggested that the NEWG could repeat an earlier campaign of sending a calibration met device to stations to check these essential local readings. He has started such a process by sending a device to Ukraine. Ludwig also said that station range bias feedback is not

always consistent between ACs.

Beam divergence measurement Matt presented the document containing instructions on the beam divergence measurement procedure and asked if the NEWG could recommend it to stations. Not all present had seen the document sent on email and others had not had the opportunity to test the procedure and so it was agreed that Matt will send the document out again. Some colleagues said they would like to know their beam divergence with some certainty and it was also suggested that plotting station beam divergence against beam diameter would be interesting.

Station Changes Log Only 16 stations have so far submitted a Station Changes Log file. It was agreed at the previous NEWG meeting that this was a reasonably straight forward file format and all stations should be expected to keep such a file up to date. The NEWG should remind stations to produce this file.