GLONASS Provider’s View on the Outcomes of the Interoperability Workshop

T. Mirgorodskaya
Central Research Institute of Machine Building Information and Analysis Center for PNT

WG-A Interim Meeting, Vienna, 11-13 June, 2013
Signals at One Center Frequency

• Is there a need that open signals of all systems in L1 should be centered at 1575.42 MHz?
Signals in Different L1 Frequency Bands

• Is it desirable to have signals at two center frequencies in L1, at 1575.42 and 1602 MHz?

**Note:**
It comes out that it is desirable there were two groups of signals centered at two different center frequencies

![Bar chart showing responses](chart.png)

- Yes: 36.4%
- Unclear: 18.2%
- No: 45.5%
Common Signal Spectrum

• Is common signal bandwidth important?
Common Modulation

• Is common signal modulation important?

![Bar chart showing the percentage of responses to the question:]

- Yes: 0.0%
- Unclear: 0.0%
- No: 100.0%
Content of Navigation Message

• Is common content of open signals navigation message important?

![Bar chart showing 100% for No, 0% for Yes and Unclear]
Pilot Signal

• Is there a need to have pilot signal in addition to data component of civil signal?

[Bar chart showing 100% in the 'Yes' category, 0% in 'Unclear', and 0% in 'No']
FDMA Signals

• Will open FDMA signals be used after FOC of the systems transmitting full set of CDMA signals is achieved?

![Graph showing the percentage of years after FOC when open CDMA signals are used.]

YES

- 100.0% Before FOC of GNSS transmitting open CDMA signals
- 72.7% 10 years after
- 36.4% 20 years after
- 0.0% After 20 years
• Will L1 C/A be used after FOC of the systems transmitting new open signals is achieved?

Note: L1 C/A has narrow bandwidth and is faster to acquire!
New signals at 1602 MHz

- Will new signals at 1602 MHz be used?

**Note:**
- Would be great if more than one GNSS transmitted civil signal at 1602 MHz
- ICAO and RTCA standards needed
E5b/L3 Signals

- Plans to use E5b/L3?

![Bar chart]

**Note:**
- No comes mostly from aviation
Dual Frequency UE

• Will dual frequency UE be used?
  – L1 + L2
  – L1 + L5/L3

**Note:**
➢ No for L1+L2 comes from aviation UE developers
Tri-lane capability

- Will tri-lane capability be provided in the future?
Number of Signal Centered at One Center Frequency

- Should the number of signal centered at one center frequency be limited?
C-band

- Should attention be paid to future signals in C-band?

**Note:**
- If yes, then at one common center frequency
Multipath

- Is wider transmitter bandwidth important for multipath mitigation?

**Note:**
- ... 20-60 MHz bandwidth
- AltBOC
Provider’s Commitments

• Should GNSS provider issue a performance commitments document?

**Note:**
- Single format document for all providers
- Agreed calculation methods for performance characteristics assessment
- Even better is to have timely information on GNSS status and performance

[Bar chart showing responses:]
- Yes: 63.6%
- Doesn’t matter: 36.4%
- Yes: 0.0%
Spectrum Protection

• Should there be any international efforts aimed at protecting GNSS spectrum?

[Bar chart showing 100% response for Yes, 0% for Doesn't matter, and 0% for No]
Conclusions

• Keep the interoperability definition as it is now
• Interoperability on the user level already achieved now
• Outcomes of the workshop in Honolulu are not strongly obvious on some signal issues
• On some issues all manufacturers are in consensus (provider’s commitments, international efforts to protect RNSS band...)
• Interoperability investigation shall be continued with more wide user and receiver community involvement
• Moore’s Law supports GNSS interoperability