Interoperability Workshops
Results Interpretation by Russian Federation

T. Mirgorodskaya, S. Silin and others

ICG-9
WG-A Meeting
Interoperability Session
12 November, 2014
Prague, Czech Republic
Common Questions (1)

• What types of applications do receivers from your company (or receiver designs) support?

• There is a threat for GNSS receivers due to many more GNSS signals centered at 1575.42 MHz. So do you prefer all new CDMA signals at “L1” to be centered at 1575.42 MHz or have some of them elsewhere, e.g., at 1602 MHz?
  RF – prefer elsewhere
  China – prefer at 1575.42 MHz – 50 %
  US – prefer at 1575.42 MHz - 50%
  Japan – prefer at 1575.42 – 83% (most doubts come from med/high prec.)

• Once there are a large number of good CDMA signals, will there be continuing commercial interest in FDMA signals?
  RF – there will be interest – 57%
  China – there will be interest – 21%
  USA – there will be interest – 18%
  Japan – there will be interest – 0%
Common Questions (2)

• Given that L5/E5a will be transmitted by most GNSS providers, do you intend to use the E5b signal?
RF – yes, intend – 60%
China – yes, intend – 42%
USA – yes, intend – 40%
Japan – yes, intend – 33% (those who intend 100% med./high prec.)

• Assuming signal quality is acceptable from every provider, would you limit the number of signals used by provider?
RF – would limit – 43%
China – would limit – 57%
USA – would limit – 78%
Japan – would limit – 33%
Common questions (3)

- Importance of common center frequency for the best interoperability?
  RF – important – 20%
  China – important – 75%
  USA – important – 67%
  Japan – important – 83%

- Will you provide “three-lane navigation” capability in the future?
  RF – will provide – 100%
  China – will provide - 93%
  USA – 46%
  Japan – 34% (100% for med./high prec.)

- Does a wider satellite transmitter bandwidth help with multipath mitigation?
  RF – does help – 80%
  China – does help – 50%
  USA – does help – 80%
  Japan – does help – 67%
Common questions (4)

• Would you recommend GNSS or SBAS services provide interoperability parameters: system clock offsets, geodesy offsets, ARAIM parameters or others?
  RF – would recommend – 100%
  China – would recommend – 71,5%%
  USA – would recommend – 100%
  Japan – would recommend – 83%

• Should the international community strive to protect all GNSS signal bands from terrestrial signal interference
  Should strive to protect – UNANIMOUS
Common center frequency

- Nearly half to half (common center frequency comes from mass market apps., different center frequencies come from med./high prec. apps)
FDMA Signals

- There are and there will be users of FDMA signals:
  Even 20% of users is a substantial number of users
E5b Signal

• No doubt it will be used
  40% at a minimum is good enough
Limitation of the number of signals used

• Most likely, at least for mass market applications
Importance of common center frequency for the best interoperability

• For mass market equipment and applications
“Three-lane navigation” capability

• Mostly yes
Wider satellite transmitter bandwidth

• Helps with multipath mitigation
Recommendation to provide interoperability parameters

- Certainly would recommend
General Conclusions (Russian View)

• Diversification of signals ensures diversification of applications. Benefits and costs should be weighed against each other.
• All available signals will be received and processed by any receivers including mass market (having in mind the Moore’s Law).
• All received signals will have different weight (depends on the signal quality) when being processed
• Central frequency diversity is the positive factor for interference resilience
• FDMA signals have distinct advantage in terms of interference protection
• Supporting PTA concept all available sources of navigation information, including as many available signal as are provided, will (shell) be used
• Political (regional) factors could predetermine which signals are to be proceed as a prime and which are to be processed to augment