An update from the Performance Standards Team

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ICG-12, Dec 3-7, 2017, Kyoto, Japan

Background

- ICG-6 (2011) WG-A(S) Recommendation 4.1 – develop a template that individual GNSS providers consider when defining open service performance.
  - Goal: reach consensus on minimum common set of parameters
  - Each system use its own definitions and calculation methods
- October 2012 – WG-A(S) prepares draft template (V2)
- ICG-9 (2014) – Draft of Calculation Methods for Template
- ICG-10 (2015) - WG-A(S) agrees not to have common document, but asks providers to share information
- ICG-11 (2016) "Dream Team" formed at ICG-11 in Sochi to push work forward
  - Steps taken to identify minimum common set of parameters

The Performance Standards Sub-group "Dream Team"

- Alexey Bolkunov (co-lead), Igor Silvestrov – Russian Federation
- John Lavrakas (co-lead), Andrew Hansen – United States
- Hillar Tork, Rafael Lucas-Rodgriguez, Daniel Blonski, Peter Buist –European Union
- Yoshiyuki Murai, Satoshi Kogure – Japan
- Jianwen Li, Du Juan - China
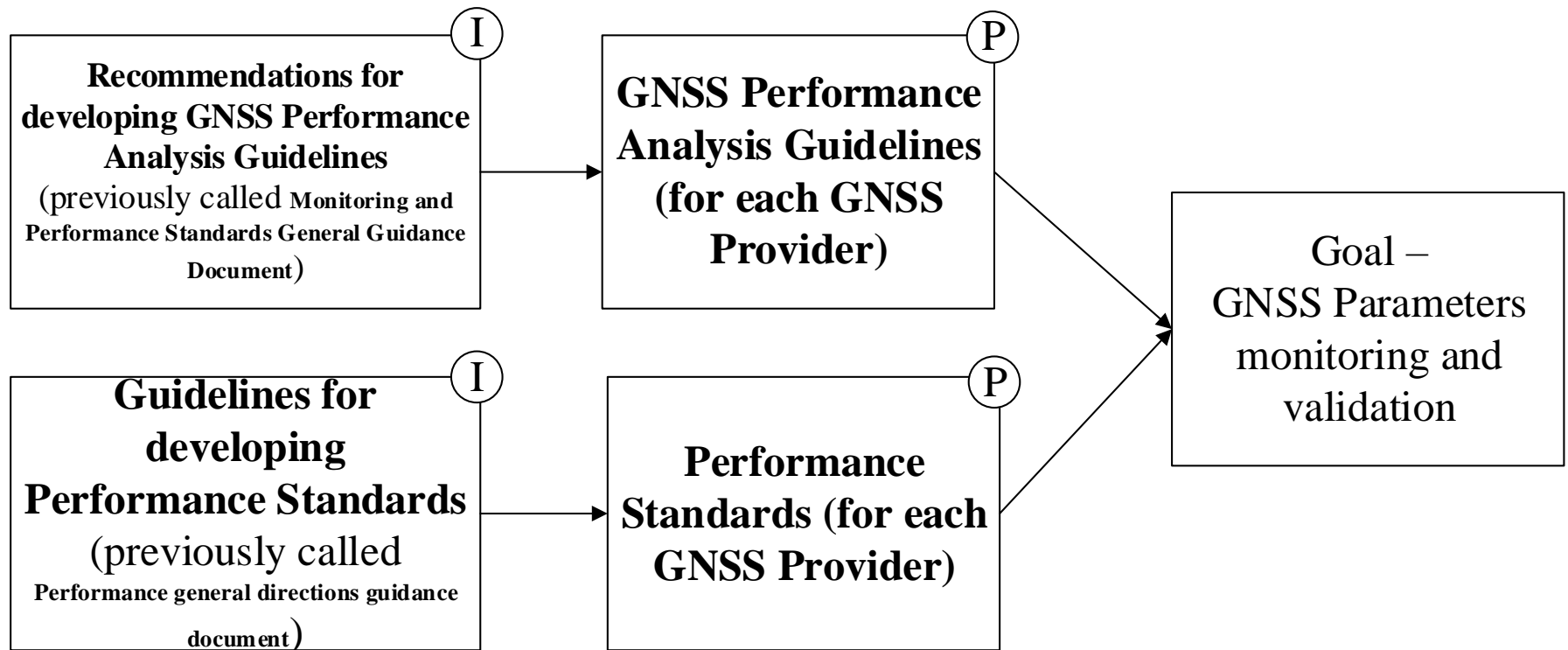
Timeline of recent events

- December 2016 – Team members <u>Survey</u> by email on minimum common parameters (Keep, Don't Keep, Maybe Keep)
- May 2017 – Guidelines to replace the 2012 template proposed at PS meeting in Shanghai
- September 2017 – Resolution of most issues in the Guidelines at PS meeting in Portland

Matrix Summary	K=keep, M=maybe, N=Not	6 = # Responses							138	107	55	6		
Standard Name	Standard Description	Andrew HANSEN	Yoshiyuki MURAI (QZSS)	Hillar TORK (Galileo)	LI Jianwen	Alex BOLKUNOV	John LAVRAKAS	TOTAL KEEP	TOTAL MAYBE	TOTAL NOT	TOTAL BLANK = 6	ALL KEEP, TOTAL = 2	CORRELATION
Per satellite coverage – space service volume [3.3.1]	the space service volume coverage per satellite is TBD%	K	M	M	N	N	M	1	3	2	0	0	0.5
Constellation coverage - terrestrial service volume [3.3.2]	the terrestrial service volume constellation coverage is 100%	K	K	M	K	K	M	4	2	0	0	0	0.7
Constellation coverage - space service volume [3.3.2]	the space service volume constellation coverage is TBD%	K	M	M	M	K	M	2	4	0	0	0	0.7
SPS SIS Accuracy – URE all ages of data [3.4.1]	the 95th % global average SPS SIS User Range Error (URE) for each SV during Normal Operations over all ages of data (AOD) is less than or equal to TBD meters	K	K	K	K	K	K	6	0	0	0	1	1
SPS SIS Accuracy – URE zero age of data [3.4.1]	the 95th % global average SPS SIS URE for each SV during Normal Operations at zero AOD is less than or equal to TBD meters	M	M	M	M	N	N	0	4	2	0	0	0.7
SPS SIS Accuracy – URE any age of data [3.4.1]	the 95th % global average SPS SIS URE for each SV during Normal Operations at any AOD is less than or equal to TBD meters	K	M	M	M	M	K	2	4	0	0	0	0.7

Current Status

- Prepared a draft Performance Standard Guidelines document
- Developing definitions (including continuity) and calculation methodologies
- Considering additional documents that can be issued for optimizing PS creation and monitoring procedures – DT Document Tree
- Considering connection with IGMA activities and support of IGMA activities

Additional Documents – Document Tree


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[I]  Recommendations for developing GNSS Performance Analysis Guidelines
     (previously called Monitoring and Performance Standards General Guidance Document)
          →
[P]  GNSS Performance Analysis Guidelines (for each GNSS Provider)
          ↘
              Goal – GNSS Parameters monitoring and validation
          ↗
[I]  Guidelines for developing Performance Standards
     (previously called Performance general directions guidance document)
          →
[P]  Performance Standards (for each GNSS Provider)
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(I) - International level document   (P) - Provider level document

International Committee on GNSS – ICG-12   2-7 December 2017, Kyoto, Japan

Roadmap & Scorecard – GNSS Performance Standards Guidelines

Item	Status	Comments
Recommend content for Performance Standards	Complete	Draft Performance Standard Template prepared in 2012
Collect inputs on minimum common set	Complete	Survey conducted in Dec 2016
Finalize minimum common set	Complete	Resolved at Sep 2017 meeting
Each GNSS/RNSS provide definitions for terms	In progress	Request for definition of continuity. Preparing document tree. Discuss at 2018 Workshop.
Each GNSS/RNSS identify calculation methods	In progress	Plans to hold 2018 Workshop in Spring in Europe
Finalize set of definitions		Target complete by ?
Issue Performance Standard template		

Next steps

- Proposal – hold workshop in spring 2018
  - ▫ Focus on Definitions, Calculations and Methods
  - ▫ Consider combined with IGMA workshop
  - ▫ Host by EU, with steering committee having reps from all GNSS service providers; set agenda
  - ▫ Dream team to formulate questions to be addressed/answered at workshop
- Increase collaboration with IGMA
  - ▫ Monitoring Analysis Guidelines
    - Distribute a draft, get feedback, provide a revised draft
- Consider future challenges and way forward for DT

Thank you!

GNSS Performance Standards "Dream Team" Co-leads

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