A UK Government activity overview of emerging PNT Services & capabilities

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Innovate UK
InnovateUK – The UK’s Innovation Agency

- up to £13.1bn return to the economy
- 7,600 organisations supported
- up to £7.30 of GVA for every £1 invested
- helped to create 55,000 jobs
- > 7 jobs created for every business invested in
Cross-Government PNT group

- Founded 2014 (InnovateUK/MoD)
- Almost all departments represented
  - Government & regulators only
  - Balanced
- Internal and industry briefings
- Information and knowledge exchange forum
- Not a *Working* group in the traditional sense
  - Not output based
  - No *formal* advice at this time
Galileo Status

- 14 Satellites launched (4 more November)
- 9 Satellites operational¹ (about to be 11)
- 2 satellites in anomalous orbit
  - +1 anomalous
- Initial Services 2016, FOC 2020 (plan)
- EGNOS operational
  - V3 Upgrade planned to include Galileo

¹ At time of writing
The MoD’s RGNS Project

- GAS1 – TRL 9

Quantities vs. Performance

- Spectrum of Defence users

- Cost

COTS

- Multi-constellation (Open Signal) for SW&P applications

PPS GPS (SAASM or M-Code) or

PPS GPS (M-Code) &

Galileo OS/PRS

Galileo OS/PRS
European Loran Infrastructure @ 31 Dec 2015

- France 2 TX CLOSED
  - Lessay, Soustons CCB CLOSED
- UK 1 TX
  - Anthorn Providing timing for the whole of the UK and Ireland
- Denmark 1 TX
  - Ejde TO CLOSE
- Germany 1 TX
  - Sylt TO CLOSE
- Norway 4 CLOSED
  - Vaerlandet, Boe, Jan Mayen, Berlevåg
UK-only Timing & Data Capability

- UTC Timing from a single UK Transmitter
- 500ns (indoors)
- Robust Data Capability
- Some sectors have a CRITICAL dependence upon timing

Picture Source: General Lighthouse Authorities of UK and Ireland
The UK Quantum Technologies Programme

- A 5 year programme with a 10 year vision.
  - Now over £350m spend
- Delivering new devices and new businesses from world leading UK research
- Industry, academia and public bodies working together to create opportunities for UK wealth creation.

Autumn statement 2013

£270M

UK Government investment in quantum technologies research
Some other current UK activities that include PNT

- Connected and Autonomous Vehicle funding
  - £100m over 5 years
- Low emission freight and logistics trial (£24m)
  - Focus on freight carrying, logistics, utilities or emergency vehicles
- Low emission vehicle systems (£24m)
  - Supports business lead R&D projects developing technology for the automotive industry
- Enabling technologies funding (£15m)
- ESA Navigation Innovation and support programme
  - Up to £100m over 5 years
Summary

- InnovateUK at the heart of technology innovation in the UK
- Cross-government group to understand common issues and share
- UK involvement in Galileo and ESA navigation programmes
- eLoran is an activity work item
- Large Quantum and transport programmes to compliment
Thank You

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