European activities on Jammers, Repeaters, Pseudolites and Interference Detection

Dominic Hayes – European Commission

(June 2012)
Interference

- Currently monitored on an individual basis by each EU country – civil/military
- Well established ad-hoc cooperation between national frequency administrations to resolve cross-border interference
- No dedicated procedure for GNSS cases
- National sovereignty on spectrum is a sensitive issue
GNSS Jammers

European Union - GNSS Programme Committee
★ EC outlined the potential jammer problem
★ Highlighted that member states should be aware
★ Some MS had strong views that no new regulation was required
★ Others thought it was!
★ Agreed that a questionnaire be circulated to collect views
★ However, only four responses so far
★ A way forward will be discussed at a future GNSS PC
GNSS Repeaters

★ Work within CEPT - ‘European ITU’
★ ECC Report 129 details technical studies
★ ECC Report 145 details regulatory issues
★ ECC (not EC) Directive being debated
★ Proposes only indoor use and with power restrictions (eg, max eirp -77 dBm)
  ★ Covered in ECC Recommendation 10(02)
★ Note: Germany dealing with unauthorised outdoor use causing problems at Hannover
GNSS Pseudolites

★ EC research body (JRC) carried out tests
  ★ Shows significant potential for interference to non-participating receivers
  ★ Shows very dependant on receiver design
  ★ Good agreement with developed simulation model
  ★ Study input to the CEPT process (SE40)
  ★ ECC Report 128 currently in public consultation
  ★ Split into indoor and outdoor use (pulsed)
★ ECC will then work on appropriate regulations
Common Minimum Standards

★ Aims to establish EU wide framework for securing GNSS use (especially for the PRS signal)
★ Initially focussing on PRS users and applications
  ★ Including PRS use in critical infrastructure
★ Includes elements on spectrum protection
  ★ Reporting interference
  ★ Classifying threat levels
★ CMS still being developed by the EU Member States, led by the European Commission
DETECTOR Project

★ Design, develop and validate a low-cost GNSS interference detection and characterisation solution for road transport
★ Early work has detected many disturbance events at sites across Europe, but they can have various causes, hence the need to characterise
★ Capturing and analyzing RF data has allowed clear jammer signatures to be isolated
★ Main elements of the solution exist. Plan to get robust operational units deployed and further automate back-office services
Deploy roadside units

Detect interference

Characterise interference

Drop in Signal/Noise of GNSS signals

Disturbed RF Power