

Complementary technology could provide solution to our GPS vulnerability

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The GNSS Interference, Detection and Monitoring Conference 2011 follows Tuesday's Royal Academy of Engineering report that set out the risks of GPS disruption from solar storms or illegal jamming and assessed what can be done to reduce impacts on society.

Solutions put forward included eLORAN (Enhanced Long Range Navigation), a revamped version of the 1950's LORAN terrestrial radio navigation systems used extensively by the US military which have been brought into the digital age and demonstrated as an ideal accompaniment to GPS. eLoran uses high-power, land-based transmitters, operating on low frequencies. The conference today saw researchers from the GAARDIAN project announce hugely encouraging results for the first ever trial of joint GPS/eLORAN receivers which tested their ability to detect anomalies caused by natural effects such as solar weather, and GNSS interference.

Bob Cockshott, Location & Timing Programme Director for the Digital Systems KTN and organiser of the Conference said, "This is a technology that must be central to future development of our location and timing systems. eLORAN is one of many viable solutions we have heard today that can deliver a more reliable navigation infrastructure but it is going to take government, academia and industry to come together to drive this forward."

George Shaw, from the General Lighthouse Authorities, a member of the GAARDIAN project, who have carried out their own eLORAN

trials on maritime systems in the North Sea, believes the technology has shown it can deliver benefits for maritime navigation and has great potential for land use.

"This research has proved eLORAN is a viable accomplice to GPS and our transport, power, finance and communications infrastructures can be robustly safeguarded through its exploitation," said Shaw.

Charles Curry, Managing Director of Chronos Technology Ltd and leader of the GAARDIAN team also announced a follow up project - SENTINEL, which brings on board the Association of Chief Police Officers to look at the ability of GPS/eLORAN systems to mitigate the influence of illegal jammers. He believes that while industry interest in their research is growing, government has a major role to play in driving the process.

"We are now calling on government to confirm future funding for the UK's eLORAN transmission centre. Only then will industry have the guarantees it needs to drive commercial development," said Curry.

Speakers at the one day conference looked at a range of technologies and solutions that might feed into a more sustainable and reliable navigation infrastructure. These included:

- The International Space Innovation Centre's Security and Resilience Unit - looking at innovation within our satellite infrastructure.
- Professor Washington Ocheing, Imperial College London – asking whether money spent on multimillion pound GNSS integrity systems such as those for the Galileo project – maybe better spent developing RAIM (Receiver Autonomous Integrity

Monitoring) systems inserted into the receiver

- QinetiQ - reporting on the latest technologies they are testing on-board harrier jump-jets as well as new antenna technologies to protect the [GPS](#) signal.

Provided by National Physical Laboratory

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