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assured positioning capability for government agencies and emergency services.”

With the UK having now left the EU, the country no longer has access to this encrypted signal, despite having contributed £1.2 billion to the development of Galileo. Curry says this makes sense from an EU national security perspective, but the decision angered the UK government.

In May 2018, it announced plans to look at the options for a UK satellite navigation system. A £92 million feasibility study has been carried out, while one estimate suggests that a system would cost £3 to £5 billion.

“Assessing what a UK system could look like, and how it would meet the country’s needs, is the purpose of the current phase of work. The potential specifications, cost and schedule will depend on the outcome of this work,” says a UK Space Agency spokesperson.

Curry is in no doubt that the project will go ahead in some form, citing the vastly more expensive HS2 rail project as a sign that the UK government is willing to spend on infrastructure when there are perceived benefits.

Meanwhile, Russia is beefing up its GLONASS system. Like GPS, it was started in the cold war period with military backing, but it was only completed in 2011. GLONASS satellites have a shorter design lifetime than the other systems (between seven and 10 years rather than 15), so despite the large number of launches there tend to be fewer available for use. At least 24 need to be operational, rather than 15, so despite the recent increase in launches, there are perceived benefits.

Recently, Russia has shown a new determination to keep GLONASS competitive. In January, ISS-Reshetnev Company, the chief contractor for GLONASS, announced it had received orders for 27 more satellites up to 2025, and that the rate of launches was set to double in the coming year. “There are some signs they are upgrading the technology in their new satellites, and planning to join in on L1C,” says Pottle. This would see all four satnav providers forming one super-system for civilian users – a happy ending for everyone.

Help from the skies

Navigation satellites do much more than just tell you where you are. For example, in order for power stations to feed electricity into the national grid without interference, their output must be synchronised to a particular frequency – most countries use either 50 or 60 Hz. Time signals from GPS provide a universal clock, allowing the stations to sync up.

Some satellites have other uses as well. China’s BeiDou system provides an integrated text messaging service, which is currently used by 70,000 fishing boats, both for practical purposes and so fishers can send texts to families and friends. The system could be used worldwide to provide messaging in areas outside the range of cellphone reception, because it has a massive capacity, although smartphones would need specialised receivers to be able to use it.

The European Union’s Galileo satellite system also provides an emergency search-and-rescue service to boats equipped with the right hardware, which is claimed to save 2000 lives a year. In January, a new return-link system became operational. This sends a confirmation to the person making a distress call that the alert has been received. The calls are routed to local authorities for action within half an hour.