During the past year, the evolution of remotely piloted or entirely autonomous vehicles has proceeded apace and, as we discovered during our Congress in October, there continues to be a huge amount of effort being expended in academia and other research fora in developing new, multi–sensor navigational techniques and, especially, ever more clever processing of GNSS signals in order to solve the growing demands for determining a vehicle’s very precise position but, it seems, comparatively little work on alternatives to GNSS. Around the world, this year-end has been marked by extreme weather events, some of which have been ascribed to the effects of climate change and some to the El Niño phenomenon. What if there had also been an extreme space weather event – a solar coronal mass ejection towards Earth? How would all those autonomous, remotely piloted and, indeed, manned vehicles manage without GNSS? It is not just we navigators who need a back-up. What about financial markets, power grids and communications networks? At the end of 2015 France and Norway will cease funding the eLORAN infrastructure in their territory thereby denying its use as a back up to GNSS in NW Europe. At the same time the US Army and US Department of Transportation have recently expressed renewed interest in an alternative positioning, navigation and timing system and the Republic of Korea is vigorously pursuing the development of one. Furthermore, the United States Navy is reintroducing training in astro-navigation for its personnel as it recognizes that there is a need to have a fall back method of determining position in the event of GNSS denial for whatever reason.

Several of the presentations at Congress introduced yet more proposals for systems that purport to assist the human operators of traditional craft and particularly marine vessels. But, however sophisticated such systems are, they are generally disincentives to the operator to look out – still the primary method by which we humans generate local situational awareness. All types of manned, remotely piloted and autonomous vehicles need to ‘look out’ by means of one, or more, sensors in order to avoid conflict with other vehicles and specifically, if they are to be permitted to operate amongst manned vehicles, traffic such as airliners and marine craft, not to mention pedestrians!

It is to be hoped that 2016 will be the year when researchers, commerce and the regulators will focus on solving the twin challenges of identifying or developing: first, truly viable alternative navigation systems independent of space with seamless and responsive communication
and/or data exchanges, fully able to function wherever required, including indoors, underground and underwater, and to provide the necessary GNSS back-up capability to provide Positioning, Navigation and Timing; and, secondly, multi-sensor suites that will enhance every vehicle’s capacity to be fully aware of its situation in relation to both its physical environment and other users of that environment.

We wish a happy, successful and safe New Year to all our Members and readers.

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