



AVOIDING A HOMELAND SECURITY ERROR THAT COULD LEAVE THE U.S. FLYING BLIND

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Most of us are aware of the many wonderful uses of the Global Positioning System (GPS) that allows us to pinpoint our location anywhere on the globe, often within just a few meters. We find our way in our cars, locate nearby gas stations, restaurants and other points of interest, see aerial views of cities and towns, and even set our watches by the atomic accuracy of the GPS signals. Since President Clinton ordered that the Department of Defense turn off “selective availability” that degraded and scrambled GPS, reserving the accurate signals for military use only, the cost of civilian GPS units has plunged, and the usefulness has increased many-fold. GPS now guides unmanned vehicles in the air and on the ground, aids in weather reporting, synchronizes cell telephone towers, and navigates ships through our crowded sea lanes and harbors.

GPS, however, is neither the first nor the only radio navigation system used. An older system, Loran, still operates around the world, providing useful and accurate navigation and timing information to mariners and pilots. Loran stations (computerized transmitters and radio towers) are located around the world, with many in the United States, and some US operated stations in “chains” that are linked with stations operated by other nations, notably Great Britain and Japan. The present generation of Loran, designated Loran-C, was due to be upgraded to an enhanced version “eLoran” within a few years, and other nations have already started the upgrade.

The total cost of operation for US Loran stations is approximately \$36 million per year. Having successfully served the public for over thirty years, however, Loran has outlived the generation that designed, built and operated the system. It lacks powerful contractors who profit from its operation and congressional sponsors, to whom a remote radio installation that brings few, if any jobs, merits no support. In short, Loran is an orphan.

The Department of Homeland Security has now announced that it intends to shut down the Loran system on February 8, 2010. Never mind that other agencies have praised the system, that it works well, and that its continued operation has been deemed essential to national security. In order to save \$190 million (a dubious figure, as it fails to account for shutdown, demolition, and site remediation costs) DHS will soon put the nation at risk.

Why keep a thirty year old system working? Why spend a bit of money to upgrade it? Doesn't it just duplicate GPS, with all of its shiny satellites? The answers may be found in reports from the Federal Aviation Administration, the Government Accountability Office (GAO), the Institute for Defense Analyses, and the US Coast Guard. Some reasons given include the use of Loran as a reliable backup for GPS, which is prone to interference and possible system degradation and failure; use of Loran to augment GPS for better operational reliability and accuracy in the Continental United States; use of Loran as an alternative timing source for transportation and communications systems including cellular telephone systems that fail without time synchronization; and global leadership and cooperation with allies in providing maritime navigation and safety systems. [1] While the details contained in these reports are beyond the scope of this brief paper, each emphasizes that upgrading and continuing the operation of Loran systems provides benefits to national security and safety. Without Loran, the US must rely entirely on GPS for navigation and timing signals.

“Recent reports have shown that the constellation of [GPS] satellites is vulnerable to outages and service disruptions,” said Craig Spence, AOPA vice president of operations and international affairs. “Aircraft Owners and Pilots Association has long cautioned against decommissioning Loran before a separate navigation system is established as a backup.”

In the event of GPS outages, eLoran could serve as a backup, according to a January 2009 Independent Assessment Team (IAT) report from the Institute for Defense Analyses. The report recommends that the U.S. government complete its upgrade of Loran, to eLoran, which will allow it to serve as a backup for GPS. “IAT found that eLoran was the only system which could provide position, navigation, time, and frequency backup capability for all current and potential needs,” reads the report,

which was sponsored by the Department of Transportation and Department of Defense. [2] The cost for the upgrade of the system to eLoran has been estimated at approximately \$150 million, in addition to the annual operating costs, and the upgraded system should continue to function for at least 20 years. Compare this to the projected cost of eight new GPS satellites at \$1.8 billion (plus the cost of launch and system operation) and it is easy to see how a small system like Loran just got lost in the shuffle of bean-counters trying to cut corners. [3]

If the Department of Homeland Security is truly interested in providing security to the nation, Secretary Napolitano should immediately reverse course on Loran and upgrade the system as quickly as possible – following the recommendations of many other federal agencies. Security experts always warn against systems that have a single point of failure. Without Loran, our navigation and timing systems are just that, and whether from intentional interference caused by a terrorist or enemy jammer, or a common solar storm, we may soon find ourselves literally “flying blind.”

[1] “Loran’s Capability to Mitigate the Impact of a GPS Outage on GPS Position, Navigation, and Time Applications”, Federal Aviation Administration, March 2004.

[2] “Independent Assessment Team (IAT) Summary of Initial Findings on eLoran”, Institute for Defense Analyses, January 2009.

[3] “GLOBAL POSITIONING SYSTEM: Significant Challenges in Sustaining and Upgrading Widely Used Capabilities”, GAO Testimony Before the Subcommittee on National Security, Foreign Affairs, Committee on Oversight and Government Reform, House of Representatives, May 7, 2009.

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