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DHS S&T Demonstrates Precision Timing Technology at the New York Stock Exchange

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Contact: [John Verrico](#), (202) 254-2385

WASHINGTON – The Department of Homeland Security, Science and Technology Directorate (S&T) announced today the successful demonstration of the Enhanced Loran (eLoran), a precision-timing technology for financial transactions at the New York Stock Exchange (NYSE).

eLoran is a low-frequency, high-power radio navigation signal that is broadcasted by ground-based transmission stations, allowing the signal to penetrate through buildings and provide precision timing indoors and throughout urban environments.

“Accurate position, navigation, and timing is necessary for the function and integrity of many critical infrastructure sectors, such as the electric grid, communication networks, and financial institutions,” said DHS Under Secretary for Science and Technology Dr. Reginald Brothers. “Ensuring the continuous and uninterrupted availability of critical information ensures our national security.”

DHS S&T, U.S. Coast Guard, UrsaNav, Inc., and Harris Corporation study eLoran through a Cooperative Research and Development Agreement for applicability to provide timing information for critical infrastructure applications. The demonstration at the NYSE was hosted by Juniper Networks on April 19 and presented to technical representatives from the financial services, energy, and communication sectors.

“We are constantly working with critical infrastructure partners like the financial sector to help build their capabilities and resilience to a variety of hazards, including space weather and other cyber or physical threats to the system’s continuity,” stated DHS Assistant Secretary for Infrastructure Protection Caitlin Durkovich.

Precise and synchronized timing of financial transactions is critical to markets worldwide and is mandated by regulation in the European Union and is increasingly required in the United States. Today, precision timing capabilities are provided primarily by satellite-based Global Positioning System (GPS). However, GPS’s space-based signals are low-power and susceptible to possible disruptions. GPS signals are also difficult to receive indoors and in urban canyons.

“During the technology demonstration inside the NYSE building, we were able to not only provide signals indoors but also provide timing information to within 30 nanoseconds of our UTC reference,” said Sarah Mahmood, S&T program manager for the eLoran cooperation agreement.

Recognizing the challenges of space-based signals and the importance of having multiple timing sources, eLoran is one technology being considered to provide a complementary timing solution to existing GPS technology.

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