

that study, dubbed "vulnerability assessment of the Transportation Infrastructure Relying on the Global Positioning System," was prepared by the Volpe National Transportation System Center of Cambridge, Mass. It was released Sept. 10.

"Clearly when the [Volpe] report first surfaced, people took it seriously," said Howard Aylesworth, director of airspace systems at the Aerospace Industries Association here. This radionavigation plan "is a serious attempt to try and assess the risks and look at any remedial measures that might be necessary," he said.

The GPS system consists of roughly 24 satellites that provide position-location,

MIKE SHAW

time and speed information to receivers anywhere on the globe. It was developed by the U.S. Air Force primarily for military navigation, but also transmits signals for civilian use.

"We are seeking a sensible transition to satellite-based navigation services as our primary means of navigation, while recognizing the need to maintain backup navigation aids where required," Norman Mineta, the U.S. Secretary of Transportation, said in a statement.

Shaw said additional time is needed to integrate two new civilian signals slated for introduction into the GPS satellites,

Transportation Department wants.

"We told the Department of Transportation they need to determine their requirements for interference rejection," the Pentagon official said. "They need to go to their user community and look at what their planning will be for GPS-based services and determine how much interference rejection they need."

Once civilian GPS users determine their requirements for signal protection, the Pentagon can determine which technolo-

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aggressively and design new products, they have to know what aspects and capabilities everyone has," Stearns said. "There is still some ambiguity in what they need to do to meet the customers' needs."

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to more clearly define the GPS operational standards before they commit money to product development, Stearns said.

"For a manufacturer to move forward

CSY/Cherry

EU Ministers Approve Initial Galileo Development Funds

PETER B. de SELDING, PARIS

Two series of contracts with a combined value of 850 million euros (\$745 million) are expected to be signed this year so European companies can begin design and development of the Galileo satellite navigation system, European government and industry officials said.

The funding became available following the March 26 decision of European Union (EU) transport ministers to approve their half of the 1.1 billion euros needed to finance initial development of Galileo, a 30-satellite constellation scheduled to provide navigation and timing services starting in 2008.

The transport ministers' decision automatically freed up the 555 million-euro package that had been promised by the European Space Agency (ESA) in November, ESA's half of the 1.1 billion euro total. The EU ministers' decision, which had been expected, triggers a series of activities at ESA, which is responsible for the design, development and launch of the satellites.

Claudio Mastracci, ESA's director of applications programs, said

the agency's ruling council will meet April 13 to canvass its 15 member states about their formal participation in the Galileo program's Joint Undertaking, the organization that will be created by ESA and the EU Commission to manage Galileo.

Mastracci said in a March 28 interview that by early May, ESA's navigation board will be ready to issue bid requests for an initial 130 million euros in Galileo contracts.

This money will be used to design a payload to be launched in 2004 to reserve Galileo's radio spectrum. International authorities in 2000 awarded Europe the radio frequency it requested for Galileo, on condition that at least experimental use of the frequencies start in 2005.

Mastracci said ESA had several potential candidate satellites on which this Galileo payload could be launched.

Bids will be sought by September for 720 million euros in contracts for Galileo's in-orbit validation phase, Mastracci said. This contract, scheduled to be signed by late December, will include the design of the Galileo satellites and the related ground segment, and

the construction and launch of the first four Galileo spacecraft.

The transport ministers' resolution agreeing to Galileo's financing said that at the end of 2003, the commission will need to determine how the full deployment and operations of the Galileo system will be managed and paid for.

The deployment phase is expected to cost at least 2.1 billion euros. The ministers said their goal is for the EU Commission to finance one-third of that amount with the private sector paying for the remaining two-thirds.

Once Galileo is fully operational in 2008 it will cost an estimated 220 million euros per year to maintain and operate the system. Government officials envision using value-added taxes and fees on various Galileo services to cover the operating expenses. The commission's research and development budget is viewed as the likely source of future government financing.

The private sector, for its part, has made no commitments to any Galileo funding.

In a March 25 presentation on Galileo, Mike Healy, vice president for navigation at Astrium Ltd. of Stevenage, England, and a

member of the board of Galileo Industries, an industry consortium vying for the Galileo satellite construction contract, said industry is hesitant to invest in the near term.

Healy said that of the 2.1 billion euros needed to pay for Galileo deployment, Astrium assumes that 600 million euros will be made available from the multi-year research and development budgets of the Commission.

That would still leave 1.5 billion euros, plus the annual operating and maintenance charges. "The key question is: What happens beyond the government funding?" Healy said. "By 2005 we will face a 'go or no-go' decision on deployment. Industry's position up to now has been that it cannot invest early in the development phase, because the return on investment is too far into the future."

Other questions relate to whether ESA is willing to sign a system-development contract for the four initial satellites with Galileo Industries, the only publicly announced bidder. In addition to Astrium, Galileo Industries includes Alcatel Space and Alenia Spazio — all three of Europe's

principal satellite prime contractors.

ESA officials have yet to decide whether they should insist on a breakup of the Galileo Industries team in the interest of competition for the satellite construction contract.

Mastracci said it is possible that conferring the work to Galileo Industries could save money, but only if competition is guaranteed for individual components of the system underneath the umbrella prime contract.

Olivier Colaitis, chairman of Galileo Industries and a vice president of Alcatel Space, said May 27 that Galileo Industries could manage the contract while maintaining healthy competition between its members.

"One example is the Galileo satellite antennas," Colaitis said. "Alcatel, Alenia and Astrium all want to build those, and there will be a competition for that. Also, because this is an ESA contract, there will be an obligation to spread the work around and to assure that small and midsize companies play a role."

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