

Washington View

GPS III, Modernization Face Budget Cuts

Dee Ann Divis



The federal budget process for the GPS constellation and related transportation programs is bumping along in its normal dysfunctional fashion — perhaps more fragmented than usual thanks to the Washington fixation on terrorism and the biannual obsession with getting reelected.

Thus far, the GPS III budget probably will not be cut as badly as was being discussed two months ago; however, delays in the program remain likely. The Wide Area Augmentation System has taken a financial hit, but not a debilitating one, while budgets for the Local Area Augmentation System and the National Differential GPS System stand unscathed.

GPS III Allocations

GPS III funding breaks down into three areas: the funding for fiscal year 2003 (FY03) which is currently being debated in Congress, the request for FY04 now being drafted within the Pentagon, and monies for the "out years" of FY05 and beyond that are part of the overall planning process.

Although most of us think in terms of monthly budgets, the Pentagon plans in six-year chunks and the anticipated budgets for FY05 and 06 are almost as important as what is going to happen next year. All the budgets are interconnected, and the Pentagon will not let a contract for a system that is not fully funded — something that has stalled the GPS program in the past. In addition, should the deficit-driven Congress get wind of possible delays and out-year cuts, it may very possibly eliminate FY03 money because it won't be "needed" by a reduced program and can therefore be shifted to other election-year desires.

The original FY03 request for GPS III was

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\$100.2 million. The Senate cut \$14.2 million from this request in an appropriations bill passed August 1. On June 27, the House cut \$50 million. The two houses of Congress will have to meet in conference to decide how they want to handle their differences — a meeting that can take place in September at the absolute earliest.

The good news is that the authorizing committees in both the House and Senate agreed to the full \$100 million for GPS III. Unfortunately, the Air Force can't spend what it doesn't have — the appropriation actions carry more weight.

The reason for the cuts is clear Col. Douglas Llovero GPS program director at the Air Force GPS Joint Program Office told *GPS World*. "We were supposed to award the GPS III contract this year and we didn't. So they are saying you should not need as much next year." GPS officials are hoping to get the funds restored but success will depend in part on the outcome of the ongoing debate on whether to delay the GPS III program by several years.

Further Delays

In the view of some, the current GPS constellation is working well, and other space projects with massive cost overruns need the money more. Well-placed sources told *GPS World* earlier this year (Washington View, July 2002) that Air Force officials were considering cutting the budget in FY04 through FY06 altogether — a gash in the program of hundreds of millions of dollars. If adopted the cuts would delay the first launch of a GPS III satellite until 2015.

The current consensus among half a dozen well-connected sources inside and outside of the federal government is that the schedule will not be pushed back that far. They say current plans will place the first GPS III launch around 2012. What is unsettling is the process is still very much in flux and there is a great deal of debate taking place within the Pentagon — mostly focused on the out-year budgets.

One thing that does appear to have changed, as related consistently by those who discussed the matter with *GPS World*, is an increased awareness of the importance of GPS III to the military and a willingness at the highest levels to make funding GPS III a bare-knuckle priority.

The DoD should reach a decision on the schedule for GPS III soon, because the agency must submit a budget request for FY04 by August 22. That request will necessarily reflect the thinking on the out-year budgets.

Setting Requirements

Nothing is going to happen however, until the Air Force nails down the requirements for the GPS III system and obtains the necessary approvals to proceed with contracting.

A lot of interesting ideas are floating around for GPS III. Some requirements are clear; such as more power for the military signals. (See "Power Struggle" sidebar.) That power may need to be flexibly managed as well. Sources agree that system operators will also seek improved integrity. Llovero said they would ask for a signal-in-space range error of 20 centimeters, as opposed to the current threshold of 50 centimeters. That would increase positioning accuracy from the current 1.5 to 2 meters to under a meter — the difference between being inside or outside of the sandbags or stepping on a landmine.

Power Struggle

During an interview with *GPS World*, Col. Llovero also cleared up some of the confusion on how much more power the satellites are expected to transmit under the new "flexible power" plan. Part of the issue, he said, is where you start measuring from.

The intent of the flex power plan is to reach -150 dB. The current requirement for the P/Y code is -159.6 dB. "To make things more confusing," said Llovero, "the requirement for M Code is -157 dB." Moreover, the current GPS satellites actually deliver more power, than is required — about -158 dB for the P/Y code. Some people think you should measure from the actual power delivered.

The Air Force has chosen to measure from the -159.6 dB point. Llovero said that they think they can achieve -150.7 dB.

The power can be swapped or traded between P(Y) or M-Code, that is, increased on one signal or the other, but not both at the same time. The power can be varied from -159.6 to -150.7 dB and back in selectable 0.25 dB increments. L1 and L2 can be controlled independently, so that operators could increase either P(Y) or M-Code on both L1 and L2 at the same time. The civil signal power level will be held constant and not affected by changes in the military signals.

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Many other suggestions to add capability to the satellites or otherwise change the system have also emerged during the review process. Communications and search and rescue capability are examples of possible add-on missions. Proposed changes in the mix of satellites, as well as how the constellation is configured and managed, have also been considered. Some changes are aimed at surviving an attack. For example in the future there may be three spare satellites on orbit and the satellites may automatically talk to each other to maintain the system if ground systems are disrupted.

Decisions on the preliminary requirements are somewhat delayed but the requirements should be validated by September or October said Llovero. These requirements will be the basis of a winner-take-all contract for GPS III and form the framework for initial design efforts that take up the first 18 months of the contract.

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A Joint Requirements Oversight Council will meet on the final requirements in 2004, said Llovero. After that, construction of the system can begin.

JPO should issue the GPS III contract in FY03, although timing will depend on the amount of money Congress allocates. If the amount requested is cut by Congress then the contract will necessarily have to start later in the year — any contractor will bill the government a certain amount each month. One way to manage a shortfall at the beginning of a project is to delay the start date so you pay for fewer months that particular year.

"If we only get the \$50 million dollars, as the SAC [Senate Appropriations Committee] has marked to, then we won't have enough money to award a contract early in the year," Llovero said. "We'll have to award the contract very late — very, very late, in the year. That would pace the RFP being released sometime in the March/April/May timeframe."

Modernization

While GPS III ran afoul of the appropriators, the opposite was the case with the FY03 request to upgrade the IIR and IIF satellites, which Congressional authorizing committees rejected.

Modernization fared well in both the House and Senate Appropriations Committees. Both appropriations committees approved the money needed for the flexible power plan, \$28 million, as was the necessary movement of that money into a procurement account. This is important as last year modernization stalled when Congress

stamped its collective foot and said that the modernization program could not be paid for with monies from the Research, Development & Testing account — it was a procurement activity and needed that flavor of funds. Of course, they didn't quite get around to shifting the money.

Unfortunately, the authorizing committees did not agree to the flex power funding because they did not get clear information in time on what the program change was about.

"We believe that most of that stems from a misunderstanding of what we were going to do with the money. We've worked a lot with those committees and we feel fairly confident that those dollars will be restored," said Llovero.

Should the authorizing committees fail to restore the money for flexible power budget the DoD would likely appeal for reconsideration.

The exact satellite procurement phasing is still being finalized based on program sched-

ules and available funding. However, the first six satellites will likely be procured through FY04. The next six satellites (SVs 7-12) will likely be procured in FY05 and FY06.

WAAS Progresses

The president requested a little over \$110 million for the Wide Area Augmentation System. On July 25, the Senate cut that request back to \$98.9 million. The House has not voted on the budget.

The reason for the cut, according to the Senate appropriations report, was that DoT had not used money already provided in FY02 to let a contract for geostationary satellite services. These services are meant to provide redundancy to the capability of the two INMARSAT satellites.

The Senate complained that they had granted a special request for more money for geosat services in the last fiscal year but the "initiative, as with so many others within the WAAS program, will be delayed. This has resulted in a diminished requirement for funds in fiscal year 2003."

The rather cutting comment referred to the effort in 2002 to buy services on the Telesat Canada Anik F3 satellite, explained Dan Hanlon, WAAS Program Manager.

DoT had gone to Congress and asked for \$5 million to get service from the proposed commercial spacecraft. By the end of the first quarter of the fiscal year, however, the business case for what had looked to be a solid project disappeared and the satellite was no longer going to be launched on the original schedule. Anik was no longer an option so the money was not spent.

The funds stayed in DoT, which spent some on

development activities, a move Hanlon said DoT had advised Congress of. The rest, plus \$20.5 million of the FY03 request, will go to cover the cost of a new satellite services contract that is literally in the works now. DoT has received bids and is currently reviewing them. The agency will let a contract during the first quarter of FY03. The FY03 request also includes \$8.5 for the Inmarsat services.

The Senate funding cut will not affect the current schedule, said Hanlon. In fact, DoT had let Congress know that that the original request of \$110 million, arrived at over a year earlier, was a bit high. Hanlon said they had revised their request to \$99.5 million. "We believe there should be no impact to the schedule (at this budget level)." The \$700,000 difference between this and the Senate appropriation will mostly come out of activities such as developing instrument procedures, said Hanlon.

WAAS contractor acceptance inspection, or CAI, is set for September 2003, with full commissioning of the system by the end of the year. At that point, it will be ready for full operational use. "When it is commissioned, that means it is in operation. People can fly IFR [instrument flight rules] with it — bad weather and everything else," said Hanlon.

Hanlon noted that the final 60-day test of the system had commenced July 18 — months ahead of schedule. He said that the contractor, Raytheon, might be able to deliver the system in the first quarter of next calendar year.

Any more funding cuts, however, would delay the system past its planned dates, Hanlon said. "It is critical that we get that funding. If we don't get the funding, it will impact the ability to commission the system. Because activities associated with commissioning and completing the contract will not be completed. We have to get the funding."

LAAS & NDGPS

Unlike their larger programmatic brethren, the Local Area Augmentation System and the Nationwide Differential GPS System are not facing budget crunches. The president's budget asked for \$55.8 million for LAAS an amount that the Senate has agreed to. The White House only requested \$6 million for the NDGPS program, an amount that the Senate has already agreed to. The House has yet to weigh in on the budget requests.

The money for NDGPS will follow its usual circuitous route to the accounts of the Coast Guard who is doing most of the work to put the NDGPS sites in place. Some of the money will be allocated initially to the Federal Aviation Administration, some to the Highway Administration and some will go to the Railroad Administration, which is leading the slow build up of capability. This schizophrenic method of

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payments may be necessary but it hampers the program greatly.

9/11 Impact

For all the endless obsessing that lawmakers are doing over 9/11, the attacks a year ago appear to be having a surprisingly limited impact on GPS and its related systems. One would think that a system as vital to the power grid, financial network, and transportation infrastructure as GPS might rate a little more Congressional anxiety.

The biggest direct effect, according to staffers, is that Congress is so tied up with Homeland Defense, the Transportation Security Agency, and the war against terror that little attention is being paid to any of these other programs. One staffer who normally is involved in parsing GPS requests summed up the situation: "We haven't begun to look at these programs."

Congressional inattention could be good news for WAAS, which appears to already have made its deal. It could be bad news for the flex power plan, which needs the authorization committees on both sides of Congress to change their minds on budget cuts. Such an about face sounds simple but it really isn't that easy. Congress gets so crazed at the end of the year that even impor-

tant things routinely fall through the cracks. The good news is that GPS contractors Boeing and Lockheed Martin have a financial stake in the outcome of this "discussion." When it comes to getting congressional attention these two players are formidable.

One other development last September could have more lasting effect on GPS-related budgets — but it happened on September 10th not the 11th. That was the day that the Volpe National Transportation Systems Center released its report on GPS vulnerability.

The report caused DoT to move to retain more navigational aids such as instrument landing systems than it had originally planned. These are the systems that WAAS and LAAS were intended to replace, thereby saving lots of money.

Exactly how many will stay online remains to be seen, said Mike Shaw, DoT's Director of Radionavigation and Positioning. "There is a capability Assessment study under way," Shaw told *GPS World*. "By the end of the year we're supposed to come out with specific recommendations on how much of that ground radio navigation structure needs to remain." Whatever the result, a further strain will fall on DoT's budget from sustaining more systems. There will also be a rethinking at some level of the need for WAAS and LAAS.

The LAAS program, in fact, commissioned a fresh look at their cost/benefit case this June. Among other activities, the study contractor will update the list of airports that can expect to receive Category 1 LAAS systems, said Steven Hodges, LAAS Program Manager. It is possible that fewer airports will need LAAS installations. Should the cost/benefit change significantly it could result in budget cuts down the road.

There have also been consistent questions on whether the WAAS system, which covers the U.S., is worth the price tag. Though the development money is largely spent, the question is almost sure to come up again. For example in the plenary session of the ION Annual Meeting, in Albuquerque, June 24, Llovero said, "We believe we could provide WAAS-level integrity within the GPS system for about the same cost [as WAAS], but providing global coverage."

In the end, all the GPS and GPS augmentation programs, except the steadily plodding NDGPS, are facing some kind of long-term uncertainty. While this is nothing new the long-term impact on the U.S. of further financial follow ups — especially where GPS III is concerned — could be profound. Let's hope that the Congress and the DoD are not penny-wise and pound-foolish. ☹

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