

Military Space Communications Lacks Direction, Critics Say

BY STEW MAGNUSON

The Defense Department is at a standstill when it comes to figuring out what it will require to maintain its future military space communications architecture, both industry and government officials said at a recent industry conference — and nobody seems to be in charge.

The backbone of military communications for expeditionary warfare is increasingly dependent on satellites. U.S. forces showed up in Iraq in 2003 with satellite terminals, and left eight and half years later having never bothered to tap into landlines.

During that time, the demand exploded for communications satellites as a means to link between long distances. The U.S. military, lacking the capacity to send large amounts of data through its own systems, was forced to go to commercial satellite operators and lease transponders at high costs — currently some \$1.2 billion per year. An estimated 80 percent of all U.S. military satellite communications now travels through about 50 private sector spacecraft, which do not provide the highly protected, jam-resistant capabilities the military needs.

Lt. Gen. Ellen Pawlikowski, Air Force Space and Missile Center commander, said the demand for satcom coverage will increase, even as the service's budget in the current defense spending downturn is expected to decrease. Commercial satellites will be an integral part of the military's communication architecture for years to come, she said.

The current fleets of military satellites can't keep up with demand, and there are no new programs under way.

"We are not in an environment where I can afford to start large programs," she said at the Satcon conference in New York City.

Someone in the Pentagon needs to take charge, but it isn't clear who that should be. No one has a 51-percent vote on which direction the Defense Department should go, military and industry officials said at the conference.

The office of the secretary of defense, the Defense Information Systems Agency (DISA) and the chief information officer all have roles to play. The Air Force and Navy build and launch communication satellites and the four services separately acquire the terminals needed to link to the spacecraft. Lawmakers on Capitol Hill also have a say.

Every few years, the OSD produces a roadmap for the robotics community. It spells out what capabilities the military wants in its unmanned systems and by what date, projecting its needs out 20 years. No such roadmap exists for the communications enterprise.

"This is a true leadership challenge because not everybody has the same boss," said Charles Beames, strategic advisor for space and intelligence at the office of the undersecretary of defense for acquisition, technology and logistics (ATL).

Beames has been called one of the few officials in the Pentagon who understands the nexus between military satellite needs and the commercial sector. He is spearheading two efforts to sort out some of these issues.

Beames has asked Deputy Secretary of Defense Ashton Carter to request that the Defense Business Board look into more common sense and efficient ways for the military to lease capacity on commercial satellites.

At the same time, he has asked his boss, ATL Undersecretary Frank Kendall, to look at some of the larger issues concerning the future of the military space architecture.

Beames announced the two efforts at the conference, where executives from all the major commercial satellite providers gathered. There, they met with Air Force and other officials to seek clarity on the way forward.

Confusion has so far reigned.

In September, the Defense Department's Chief Information Officer Teri Takai released guidance spelling out how commercial satellite operators, when carrying U.S. military payloads, can utilize radio spectrum reserved for the armed forces.

Industry leaders complained that the document was produced without their input, and that the language appeared to be restrictive.

There will be an addendum to clarify the guidance, Beames said.

"I think it was well intentioned, but at the same time there are some areas in the letter that probably need better explanation," Beames said.

He didn't want to elaborate.

He also didn't want to spell out exactly what will come of Kendall's efforts to sort out all the questions concerning how the military will proceed with integrating commercial satellites into the military architecture. He stopped short of describing it as a "study."

First, there would be "a tacit agreement with senior leadership to make a framework to move forward."

Kendall will address the lack of synchronization between the terminals the four services produce and the satellites the Air Force and Navy launch, he added.

This is also a long-standing problem that no single entity has the authority to fix. The two services launch communication satellites, but other program managers — with their own budgets, schedules and rice bowls to protect — develop and field the ground systems.

Sometimes the satellites are sent to orbit before the terminals are fielded. Sometimes they sit in mothballs waiting for the spacecraft to launch. Rarely are the programs coordinated.

It is an important issue in a tough fiscal climate. As costly as it is to build and launch sophisticated military communications satellites, the ground-based terminals are collectively far more expensive. The U.S. military spends \$20 billion per year on the spacecraft, but \$180 billion on the ground systems.

Joseph Vanderpoorten, technical director of the milsatcom directorate at the Space and Missile Center, said his organization is changing its relationship with both the private sector satellite communication providers and DISA, which is in charge of purchasing time on commercial communication satellites to fill demands that the military can't meet.

"You will see no daylight between DISA and SMC in terms of our joint pursuits, our joint affordability and performance decisions," he said at the conference.

"We are building bridges and conversations with our staffs," he said.

Part of the issue is that the services all have different desires when it comes to what it wants from satellites.

The Navy loves wideband, protected communications and has interests in covering certain regions of the world.

Communications

of Intelsat General Corp. There are large bodies of water where satcom companies have no incentive to operate. She estimated that there is about one-fourth the satellite capacity in Asia-Pacific of what is found in the Middle East. If there was some kind of surge scenario, it is doubtful the military could call on the private sector.

The Navy, which would be operating presumably more than the other services in the Pacific under this shift, is launching a fleet of new satellites, the Mobile User Objective System.

Only one of a planned fleet of five is in orbit. The program has become a poster child for launching spacecraft before terminals are ready, with the maligned joint tactical radio system program that would have provided communications links being canceled this year, and the waveform that would support it still under development.

The Air Force, meanwhile, is in a procurement, not a development mode. After long, painful years attempting to ready its two newest communication satellites, the first of the Wideband Global Satcom and Advanced Extremely High Frequency spacecraft are in orbit. AEHF is intended for strategic communications, particularly highly protected command and control over nuclear assets. WGS addresses tactical communications needs.

Pawlikowski said with no new satellites in development, her vision is "disaggregation." Smaller satellites will satisfy the growing demand for more tactical communications. She is also a strong proponent for hosted payloads, where a communications package might hitch a ride on a larger commercial satellite. Meanwhile, "affordability" is the buzzword at Space Command.

Commercial satellite providers have met the surge requirements but that is not the most efficient and effective way, she said. Even though the wars in the Middle East are winding down, the demand for commercial satellite services will continue unabated, Pawlikowski added.

The question for space command is whether private sector satellites are to be considered part of the service's baseline architecture. Discussions on that are "ongoing," she said.

Industry is also wondering whether the Air Force will be content to simply continue buying more WGS satellites to meet the tactical communications needs. They are powerful, high-throughput systems, but the technology will one day be outdated.

Just re-hitting the "buy" button on satellites with 10-year-old technology is not a satisfactory solution, Beames said.

The problem has its roots in the cancellation of the Air Force's Transformation Satellite Communications System, or T-Sat, program in 2009. Nothing emerged to take its place, he said.

"After that termination a few years ago, we really have across all different segments, been in an ad hoc mode," he said.

"There really has not been an organized effort ... to come up with what I call a business framework to address that," he said.

Sears told National Defense that commercial satellite operators are happy to accommodate the military, and can integrate the

specialized payloads it requires onto its spacecraft. They just want guarantees. They are not going to pay the upfront costs of adding more sophisticated, protected communications payloads if they can't be assured that the customer will be purchasing their services in the future.

Such services are currently acquired through the General Services Administration and DISA with Future ComSatCom Services Acquisition contracts, basically the same indefinite delivery/indefinite quantity mechanism used to buy mundane items as pens and paper.

An IDIQ buying process is not going to incentivize industry to build protected satellites, Osterthaler said.

Sears said commercial operators are constantly replenishing their fleets. There are always opportunities for the military to bolt on a protected payload, but the Defense Department isn't nimble enough to take advantage of these opportunities, and the procedures have yet to be spelled out, she said. There are business plans that would have the military paying for the extra expense up front and taking on some of the risk as the new satellite is being designed, she noted.

"There has got to be a way for the DoD to express their interest and give their commitment at that time," she said. The military misses out on customizing the spacecraft to its specifications. By the time one is launched, the capacity might be leased out to other customers. There would be upfront costs for the government, but it would have the capacity it needed in the end.

"We are going to build those satellites anyway, it's just that we are not going to put the kind of protection features on them that the military would desire," she said.

All this "challenges the status quo,"

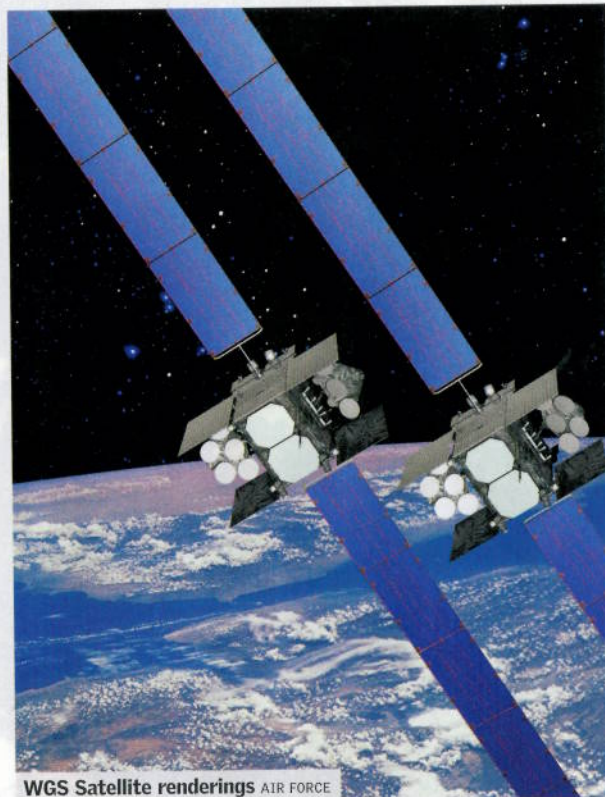
Sears said. She called Beames, Pawlikowski and Space Command Commander Gen. William Shelton "visionaries," who understand how the private sector works. But overall, the attitude in the Air Force, particularly in the lower ranks, toward commercial satellites is "if they don't own it and operate it, they don't trust it."

And the lack of trust goes both ways.

There is a cautionary tale for commercial satellite operators in another part of the space sector — remote sensing.

Two publicly traded companies, GeoEye and DigitalGlobe, built and launched satellites believing they had a 10-year, \$7.3 billion deal to provide high-resolution imagery to the National Geospatial Intelligence Agency. Nine of the 10 years were "options," though. And the NGA sharply curtailed its service contract as its budget was slashed. The two companies were forced to merge in 2012.

"That does give us pause," Sears said. "As a company who makes investments in new assets, we look at that and have to ask ourselves 'how do we know that the government is going to be a long time customer?'"



WGS Satellite renderings AIR FORCE



The Army wants more mobile “on-the-move” capabilities as well as the ability to operate in urban settings and jungles with thick canopies.

The Air Force wants to link to its remotely piloted aircraft and have access to high capacity service at a moment’s notice globally.

“These are very different requirements that don’t line up perfectly with commercial” satellite providers, he said.

The center is conducting various studies to see what a future architecture would look like. Those results “are still being cooked,” he said. These studies will not result in any concrete decisions as to the future, he said. They will “lead to a conversation,” he added.

If anyone should be put in charge of overseeing or creating a vision for the U.S. military’s communications architectures, there are many questions that need to be answered.

The Air Force Research Laboratory continues to invest in high-

throughput laser communications technology, but there are no programs of record to integrate it into the architecture. (See story page 34.) Also, can aerostats or high-endurance, high-altitude unmanned aerial vehicles take up the slack when satellite capacity is lacking? Those alternatives to space-based systems are not in Space Command’s purview.

The so-called “pivot to Asia” poses another question.

“If the new national security strategy foresees a lot of engagement in the Pacific, there had better be a good understanding of what communications infrastructure exists out there to support the execution of that strategy,” said Robert “Tip” Osterthaler, president and CEO of SES Government Solutions. SES is one of many commercial satellite operators from which the U.S. military purchases satellite communications capacity.

“The Pacific is a very different region,” said Kay Sears, president