

# The Impact of Major Gifts on the Cadet Educational Experience

This is the age of high-tech military dominance, unmanned aerial vehicles, GPS satellites and precision weapons. This is also the age of skyrocketing cost overruns, blown deadlines, and inoperative billion-dollar projects. These cost overruns and delays are reaching crisis levels, often causing critical defense projects to grind to a halt with little chance of recovery. The architect of many of the defense innovations that we rely on today has long been analyzing our current defense situation, consulting with other experts and top government officials, and reporting his findings. He has also devoted himself to making a way out of this morass by supporting the U.S. Air Force Academy through the Association of Graduates' major gifts program, creating a new generation of Academy graduates who are specifically trained to overcome and eradicate these obstacles.

## BEGINNINGS

Dr. Paul Kaminski graduated from the Academy in 1964 and served as an active duty officer for 20 years. With advanced degrees in Electrical Engineering and Aeronautics and Astronautics from M.I.T. and Stanford, he has been recognized as a pioneer of the first Stealth aircraft program and has worked on the nation's first Precision Guided Munitions and pioneered the creation of a reconnaissance satellite system that expanded intelligence gathering capabilities from space. "One of those vehicles is still orbiting the Earth more than 20 years after it was launched," says Kaminski, "producing very important intelligence for the Air Force and our country." He also served as Undersecretary of Defense from 1994 to 1997, managing all Department of Defense research, development, and acquisition programs. Kaminski has also complemented his career by taking on responsibilities as an executive officer at several technology companies and as Chairman of the Board of the RAND Corporation, a non-profit research organization. His experience has made him one of the most sought-after systems engineers in the country.

Systems engineering (SE) is a holistic, "big picture" approach to the engineering of large, complex projects. It involves managing diverse tasks, such as determining the feasibility of a project at the start, selecting and integrating the most effective and appropriate hardware and software, and monitoring progress, testing equipment, and evaluating data, all with an eye on the bottom line. Systems engineers must understand the mission and have a broad, interdisciplinary knowledge across many areas of engineering, like electrical, chemical and mechanical engineering. They support projects from beginning to end.

Kaminski's extensive experience and discernment alerted him to a growing trend in the military. "I could see the need for a broader base of systems engineering skills in the Air Force," says Kaminski. "I felt we had lost some of the base that we had established when we were developing our ballistic missiles and our first spacecraft. We had reaped the benefits of the Apollo program that excited many people."

He connected this observation with the current state of defense. "My sense is that this loss of SE domain experience is one of the reasons we are having trouble with major weapons systems," Kaminski explains. "What I mean by domain experience is that you can't just take a SE course and suddenly move from spacecraft to aircraft to ground vehicles and expect to practice equally well in all three areas. You have to get a deep understanding of the domain to be able to make the kind of tradeoffs and decisions that SE tools support."

Seeking to strike at the roots of the problem, Kaminski started to look at the way many Air Force personnel get their start. “When I looked at my experiences at the Air Force Academy, the entire agenda was appropriately devoted to flying and fighting,” says Kaminski. “But as I looked at where the Air Force was going, I felt systems engineering was going to make a real difference. It was hard to get that kind of specialized emphasis at the Academy.” This analysis led to his most generous gift to the Academy.

As a contributor to both the Association of Graduates and the USAFA Endowment (he serves on the Endowment Board as a Founding Director), Kaminski has a long history of unwavering support for the Academy. In 2006, he entered into a gift agreement with the AOG, consisting of hundreds of thousands of dollars, to establish the Paul and Julie Kaminski Visiting Lecture Seminar Series for Engineering and Systems Engineering through the major gifts program. Major gifts are generally large, multi-year commitments that may be used to accomplish a specific priority at the Academy or be used to meet the Academy’s most immediate needs. The Kaminski Endowment is one of many major gifts that the AOG efficiently manages to fund heritage, athletic, academic, and character initiatives. Currently, there are approximately 60 endowments administered by the AOG, and almost 400 major donors contributing at levels of \$10,000 and up. In addition to the Kaminski Endowment, major gift contributions have established the Just-in-Time Teaching Endowment and the Memorial Pavilion. They also fund the Center for Character Development, the home of nationally-recognized enrichment programs like the National Character and Leadership Symposium.

“I saw a need and an opportunity,” Kaminski relates, “The best way I could think of meeting it was not by setting up a Chair, but by bringing back Air Force engineers, especially graduates on active duty, to talk to cadets about their experiences when the cadets were looking to choose a major.” The endowment fund provides for two annual lecture seminars; one drawing from any engineering discipline and the other drawing from systems engineering. His vision was two-fold: to provide every graduate of the Academy an appreciation for the tools and value of SE and to create a specialty track to attract cadets who would like to make SE their career.

## REVELATIONS

Kaminski’s hunch was validated in 2007, after he was asked by the U.S. Air Force to lead a National Research Council Task Force, the Committee on Pre-Milestone A Systems Engineering, to examine the role that SE can play during defense acquisitions. Acquisitions involve anything purchased by the military, from a pencil to a satellite. The impetus behind the task force can be found in a recent *The New York Times* article reporting on a Government Accountability Office study of 95 military projects. The study showed cost overruns of \$295 billion, 26 percent over budget, and an average delay of 21 months. The Air Force wanted to find out why its projects were hemorrhaging money and how to stop it. The task force’s findings were published in 2008 and Kaminski was asked to give a briefing on the report at Corona that year, where Four-star generals gather to candidly discuss the



## If You Only Knew...

Endowments through the AOG support a wide range of giving to the Academy.

The Graduate Dependent Scholarship Endowment provides advanced education for selected children of USAFA graduates.

The Warren Sneed Endowment Fund helps support the AFA Wings of Blue team.

The Kissinger Endowment provides funding to enrich the cadets’ study of national security affairs.

The Tober Family Endowment Fund supports the programs sponsored and supervised by the Department of Aeronautics at the Academy.



Lt. Col. Paul Lambertson, '90

future direction of the Air Force. In short, the report castigates the Air Force for poor project management and for ignoring the basics of sound planning from the get-go, leading to billion-dollar overruns and missed deadlines. It cites the lapse of systems engineering analysis and encourages the Air Force to train, recruit, and retain systems engineers. Most importantly, the Pre-Milestone A report recommends that SE processes be utilized in the early phases of all projects and provides a checklist of SE issues that should be addressed by each program. “The Air Force leadership took a big interest in that,” says Kaminski. “Seeing all of the four-stars light up and want to support systems engineering work gave me the motivation to come back to the Academy and see if I could put a little more systems engineering emphasis in my gift.”

On March 3, 2009, Kaminski testified before the Committee on Armed Services panel of the U.S. Senate, which included Senators Carl Levin and John McCain. His earlier work and testimony led to the Weapon Systems Acquisition Reform Act of 2009. “It’s very significant because it requires doing SE work at the start of every major Department of Defense program and includes a strong emphasis on developing SE talent,” says Kaminski. Both houses of Congress passed the reforms unanimously, and President Obama signed them into law in May 2009. In effect, this has officially made the development of qualified systems engineers a national defense priority. The next challenge: *How do we create enough skilled systems engineers to meet this overwhelming need?*

## SYNCHRONICITY

While Dr. Paul Kaminski was sharing his findings with government leadership, another Paul was diligently working on the quandary from his unobtrusive office in the Engineering Department at the Academy. Lt. Col. Paul Lambertson, Class of '90, has essentially had six different careers while serving in the Air Force. His accomplishments include flying sorties to every continent on the planet (six times to Antarctica), leading three USAF units,

and being named the “architect of the Air Mobility Command Science and Technology Enterprise.” He then began what he refers to as “the most fulfilling career I’ve experienced so far,” teaching systems engineering to cadets. Lambertson became the Director of Systems Engineering in November 2008.

The SE program at the Academy originated because Air Force leadership had also recognized the same project management issues that Kaminski recently identified. In 2003, the Secretary and Chief of Staff of the Air Force came to the Academy to discuss training programs. They had a long-term view of the situation: it took the Air Force more than a day to get into its current bind, and it was going to take more than a day to get out of it. “In our recent history with Acquisitions,” says Lambertson, “we, the Department of Defense, have done a horrible job. Two hundred and ninety-five billion dollars over budget on our major acquisitions programs—that’s the entire Air Force budget for *two* years. That’s why our Systems Engineering Program was created in 2003. We’re a big part of the solution. Our program helps to create, at a young age, systems thinkers.” This approach requires a rigorous curriculum that is responsive to the latest developments affecting systems engineering. Polls of Air Force engineers conducted in 2005 show that SE is the number one engineering need in the USAF. “Our program meets most of the needs detailed in the checklist from Kaminski’s Pre-Milestone A report,” says Lambertson. “Dr. Kaminski briefed that checklist to Congress. At the Academy, the checklist items are specifically taught in the lesson plan.” He goes on to explain what sets the Academy’s SE program apart: “We were a great example of what the USAF is doing right about educating systems thinkers at a young age, at the point of the 2009 legislation. We are different than the systems engineering programs at West Point and Annapolis. Our heavy emphasis on creating a foundation in classical engineering, is what makes the difference.” A cadet who focuses on SE as a major must select an engineering focus area to build that foundation, such as aeronautical, astronautical, electrical or mechanical engineering. The SE program graduated its first class in 2006 and has been growing ever since.

“The first thing I tell cadets is that I am privileged to be here,” says Lambertson. “The second thing I tell them is that my goal is to teach them about life and being an officer, and every now and then, they will learn something about systems engineering. It’s all very tightly coupled.” The curriculum is balanced between intensive theory and hands-on application through real-world projects, with a focus on conflict resolution through communication.

Lambertson is intent on building up the SE program. It was accredited by ABET in November 2008. ABET is the recognized accreditor for college and university programs in applied science, computing, engineering and technology. “That is huge because in engineering circles, if your degree is not ABET accredited, it’s just not really a degree,” he says, laughing. “So, one of my master’s degrees counts; the other one—not so much, even though it’s an engineering degree.” The increased focus on reform from Congress has fueled his determination. “Many of the over-budget programs belong to the Air Force,” explains Lambertson. “We have many programs in jeopardy of a Nunn-McCurdy breach.” The Nunn-

McCurdy provision requires the Pentagon to justify a project when costs reach 25 percent over original estimates. If a project cannot be justified according to criteria, then it is closed down. “The new reform legislation is like Nunn-McCurdy on steroids,” says Lambertson. This adds extra impetus to get more cadets involved in the SE program, so they can go out in their commissions and help rein in the excesses.

## CONNECTION

After becoming Director in 2008, Lambertson wrestled with the direction the SE program would take. “Our program was at a crossroads,” he says. “Are we going to continue as a major or not? Can we create systems thinkers by putting SE topics in existing engineering courses?” Lambertson found out about the Kaminski Endowment and realized he had found a mentor in Kaminski. “I e-mailed him and we’ve either spoken on the phone or by e-mail at least every month since.” Kaminski was equally delighted to find an ally for his mission. “I came back to put a little more energy into the SE program when Paul was assigned to lead SE work on the faculty,” he says, “As fate would have it, we immediately hit it off. I know it will take a while to see this program have impact at the Academy, but we have Paul Lambertson who is both capable and has incredible energy and enthusiasm.”

## MOMENTUM

Dr. Kaminski and Lt. Col. Lambertson immediately began brainstorming about ways to expand the Kaminski Endowment to better support the Academy’s SE program. “We realized we were not using the endowment to our full advantage,” says Lambertson. “The original endowment was written very narrowly, to just bring in speakers. I am working with Dr. Kaminski and the

AOG staff to amend the endowment to include awards and media outreach—things to really get people excited about the program.”

Media outreach is crucial because the SE program may be one of the most popular majors on campus that nobody knows about. Lambertson only gets two chances to speak to the Fourth Year cadets, on the Academy’s bi-annual Major’s nights. He describes the effect that revamping media efforts has had: “After presenting our new Major’s Night message to the cadets, we had 75 people sign up for more information about systems engineering, and 11 Fourth Year cadets signed up for the major shortly thereafter. It’s all about communication—if the cadets realize something is important, they will jump on it.” Lambertson adds, “Dr. Kaminski is very excited and happy about the media outreach and allowing his foundation to support this. We want to grow the program and make it sustainable.”

Kaminski’s level of engagement and responsiveness is rare. He stays in contact with AOG staff and Lambertson to constantly evaluate his endowment so that it provides what is needed most, as quickly as possible. “My work with the AOG has been a good and positive collaboration,” says Kaminski. “I think the intent of my gift has been diligently followed and I will continue to work with the AOG.”

Lambertson shares Kaminski’s enthusiasm for the AOG’s support. “Without the endowment and mentorship that Dr. Kaminski provides to me and this program, we would be lost,” says Lambertson. “Let me reiterate: without the endowment, if we had to rely on getting government funding—which might never come—we would be lost. I can look to the Kaminski Endowment to give us this huge flexibility that we didn’t have before.”

As the program continues to unfold, the Association of Graduates will continue to support these visionaries’ efforts every step of the way, helping to launch an ambitious new generation of systems engineers. These “big-picture” thinkers will ensure the financial and technological viability of tomorrow’s Air Force, tackling tough problems with both expertise and enthusiasm. ✓

