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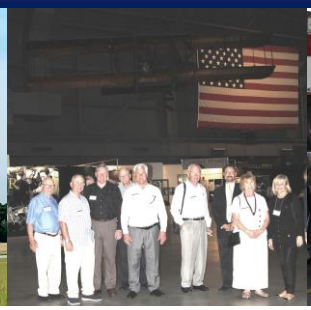


Wright Patterson AFB Program Executive Summary

July 2016

The latest DOCA adventure began, as they all do, with a hot (and early) breakfast and coffee-infused participants listening to schedule updates and reviewing procedures. Several members who were able to arrive a day earlier had the opportunity to take a flight in a reproduction of the Wright "B" Flyer, and we are happy to report there were no casualties! We were also pleased to welcome new member Bill Rands of Grosse Point, Michigan as well as several prospective members. Then we were off to Wright-Patterson Air Force Base, home of Air Force Materiel Command, the National Museum of the United States Air Force and many commands that the average citizen is unaware of but which fulfill vital functions in our current and future national defense.

Wright-Patterson has its origins in World War I when the Army Air Service established Wright Field and McCook Field. In 1948, the year after the founding of the U.S. Air Force, the two installations were merged to form Wright-Patterson AFB. ("Wright" after the Wright brothers, of course, and "Patterson" being the name of an early aviator who died in a test flight).

Our first stop was at the headquarters of Air Force Materiel Command where, after welcome remarks, Colonel Bradley McDonald, Commander, 88th Air Base Wing kicked things off. As the "mayor" of Wright-Patterson, Colonel McDonald oversees more than 5,000 uniformed and civilian personnel in operating the installation, training and deploying expeditionary Airmen, and defending the base and its people. Two runways are also managed by the Wing and they conduct an average of 47,000 aircraft operations annually. The base encompasses more than 8,000 acres and a physical plant of 16 million square feet, housing a vast, worldwide logistics system, a world-class laboratory research function, and the foremost acquisition and development center in the U.S. Air Force. More than 100 organizations representing a broad spectrum of Air Force and Department of Defense activities call Wright-Patterson home, and together they execute almost 40% of the entire Air Force budget. The base is comparable to a medium sized city with services ranging from shopping facilities to child care centers. Wright-Patterson's economic impact to the greater Dayton region is approximately $5.1 billion, and it is the largest single-site employer in the state of Ohio and one of the largest employers among Air Force bases worldwide.

General Ellen Pawlikowski, Commander, Air Force Materiel Command (AFMC) took the stage next. Several in our group had met General Pawlikowski in 2008 when she commanded the Space and Missile Systems Center at LA Air Force Base. Today she commands about 80,000 people (at several installations) and manages $60 billion annually to conduct leading-edge research, weapons systems management, test and evaluation, maintenance and supply chain management throughout the Air

Force. The General described the six different Centers that report to AFMC, but her main topic, and one that we would come back to repeatedly over the next two days, was something that the Air Force refers to as the "Third Offset." The word "offset" refers to the ability to *offset* any potential adversary's advantage in warfighting capability. The "First Offset" was our nuclear deterrent beginning at the end of World War II. The "Second Offset" was our development of (1) stealth technology, particularly in aircraft, and (2) precision munitions. Both of those *offsets* put us head and shoulders above our potential adversaries of the time. Today however, we face a vastly more dynamic and complex environment. The possibility of warfare in space and cyberspace is very real and potentially devastating. Russia is "re-emerging," China is flexing its muscles, Iran and North Korea pose obvious concerns, and non-state actors, most notably ISIS, are actively hostile. So, the "Third Offset" discussion addresses all of these and more, and is one that tries to determine the best way forward. It is a work in progress but in essence, tries to address the question of how we combine technology with tactics and strategy to *counter* those things that *offset* our current advantage in stealth and precision munitions – and, oh, by the way, can counter those non-state actors who couldn't care less about our strategic and technological superiority as long as they can find someone who's willing to strap a suicide bomb vest onto his chest. The Third Offset embraces and hopes to leverage the digital age. It looks at, for example, how we may be able to use artificial intelligence – think of all of the drones and robotics that are becoming so commonplace. But it goes a step further to examine the potential of human-machine interface, examining how we might become more interoperable with those *things* that we are able to create. And it encompasses yet more elements: Hypersonics –getting to the target faster than ever before; Directed Energy – lasers and other technology; and "additive manufacturing"—making parts on 3D printers on-site and as-needed instead of ordering them from a manufacturer and waiting for delivery. The Air Force Materiel Command is managing all of the development planning for the Third Offset, and DOCA was privileged indeed to hear first-hand about all of these concepts, strategies and new technologies directly from the source.

After the general's presentation and a lively Q&A session we were back on the bus for the short drive to the headquarters of the National Air and Space Intelligence Center. This facility is the Department of Defense's primary source for foreign air and space (including cyberspace) threats. The analysts here create predictive intelligence to ensure the nation is at the cutting edge of understanding foreign threats. The President, members of Congress, and senior U.S. military leaders rely on NASIC's all-source analysis to form U.S. defense policy decisions, and NASIC products are also used by Airmen, Soldiers, Sailors, and Marines to make their operations safer and more effective. Employing more than 3,000 personnel, the Center has four intelligence analysis groups: Air and Cyberspace Intelligence Group; Geospatial and Signatures Intelligence Group; Global Exploitation Intelligence Group; and Space, Missiles and Forces Intelligence Group.

After our tour we were joined by some of the Explosive Ordinance Disposal technicians and firefighters from the base fire department for an Ohio-style barbeque, followed by a tour of their station. The Explosive Ordinance Disposal experts, Emergency Medical Technicians, Paramedics and Firefighters on Wright-Patt serve not only one of the largest Air Force bases in the country but the entire surrounding community. They routinely respond to fires and medical emergencies outside the perimeter of the base because they, like all of the Wright-Patt Team, are a *part* of that same community.

Next up was the Air Force Life Cycle Management Center (AFLCMC), where we were met by its commander, Lieutenant General John Thompson, USAF. Modern Air Force weaponry is incredibly complex, and to ensure its reliability and cost effectiveness life cycle management is essential. In 2012, AFLCMC was created to improve weapon system acquisition and product support, simplify and reduce overhead structure, and eliminate redundancies by consolidating staff functions and processes. Today, the Center consists of 26,000 Airmen, civilian and contractor personnel at nine major locations and dozens of smaller sites. It is one of six AFMC centers reporting to General Pawlikowski, the others being: Air Force Research Laboratory, Air Force Test Center, Air Force Sustainment Center, Air Force Nuclear Weapons Center and the Air Force Installation and Mission Support Center.

The last topic for our day was the Air Force Research Laboratory (AFRL). Created in 1997, AFRL was the consolidation of four separate Air Force labs and the Air Force Office of Scientific Research. The commander of AFRL, Major General Robert McMurry, provided us with an overview. With an annual budget of $4.4 billion, AFRL conducts basic research, applied research and advanced technology development in the areas of air, space and cyberspace. Many of today's most extraordinary technological achievements such as the F-22 fighter, the B-2 bomber and the C-17 airlifter are the result of critical research performed by AFRL and its predecessors. One component of AFRL, the Office of Scientific Research, partners with industry and academia to conduct nearly 80 percent of its research.

After a brief respite back at the hotel we mounted up again for a trip to Bass Lake, the Air Force's on-base recreational facility. General Pawlikowski and her senior staff joined us for a dinner where we had the opportunity to engage in follow up discussions with our hosts. In addition to the great food and comraderie, we also enjoyed a special performance by the Air Force's "Band of Flight" who performed not only dinner music but a program of rock and pop songs and wrapped up our evening on a most appropriate note with a patriotic vignette and, finally, the Air Force theme song. So, off we went into the wild blue yonder… on a bus…back to the Hilton Garden Inn.

The first item on the agenda for the next day was the Air Force Institute of Technology. Dr. Todd Stewart, (Major General, USAF, (Ret.), is the Director and Chancellor of this extraordinary institution. He traveled with us throughout the day on Monday and Tuesday to answer our questions, and to see what we were learning so that he could tailor his presentation for us. AFIT, as it is called, is the Air Force's graduate school of engineering and management as well as its institution for technical professional continuing education, and is a component of Air University. The Institute consists of three resident schools: The Graduate School of Engineering and Management, the School of Systems and Logistics, and the Civil Engineer and Services School. Through its Civilian Institution Programs, AFIT also manages the educational programs of officers enrolled in civilian universities, research centers, hospitals, and industrial organizations. Since resident degrees were first granted in 1956, more than 17,500 graduate and 600 doctor of philosophy degrees have been awarded. In addition, Air Force students attending civilian institutions have earned more than 12,000 undergraduate and graduate degrees in the past twenty years. AFIT, through its various programs, ensures that Air Force leaders of today and tomorrow will possess the necessary education and technical skills needed to lead the world's most advanced Air Force.

We then moved on to Huffman Prairie where a Ranger from the National Park Service gave us a guided tour. Huffman Prairie is the site where the Wright Brothers perfected their airplane design. The site was preserved by the Air Force but is administered by the Park Service. The Wright Brothers' work culminated in the development and testing of the Wright Flyer III, considered the world's first practical aircraft and whose flight at Huffman Prairie Flying Field on October 5, 1905 - a flight of 24 miles in 39.5 minutes - was longer than all previous flights of 1903 and 1904 combined.

Then it was back to the Air Force base for lunch at the Wright-Patterson Club with Airmen and junior officers before visiting the National Museum of the United States Air Force, the oldest and largest military aviation museum in the world. The museum holds more than 360 aerospace vehicles and missiles on display -- many rare and one-of-a-kind -- along with thousands of historical items and powerful sensory exhibits that bring history to life and connect the Wright brothers' legacy with today's stealth and precision technology. The museum actually owns about 3,500 aircraft although most of them are loaned out to other museums around the country.

Our program concluded with a farewell dinner at the Carillon Brewery at Carillon Historical Park. The President and CEO of Dayton's Historical organization, Mr. Brady Kress, was on hand to give us a presentation on Dayton's background and its many contributions to flight, brewing and many other endeavors. The park commemorates Dayton's founding in 1796 through two centuries of expansion, industrialism and innovation. The Carillon Brewery is a fully operational 1850s style brewery and restaurant that features a demonstration of mid-19th century brewing methods and includes an exhibit about the history of brewing in the Dayton area. Everything from the architecture of the room to the costumed interpreters helps tell the story of the Miami Valley's rich brewing history. It was altogether fitting to wrap up our visit by hoisting a glass to the exceptional men and women of Wright-Patterson Air Force Base.