



FY 2009

Secretary of Defense Environmental Awards

Environmental Excellence in
Weapon System Acquisition – Team

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77th AESW, Acquisition Environmental and Occupational Health
Risk Management Branch (ASC/ENVV)

Wright-Patterson Air Force Base, Ohio

Nominee: **ASC/ENVV**
Acquisition Environmental and Occupational Health Risk Branch
Aeronautical Systems Center

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Nominating Individual: **Lt. General Thomas J. Owen,**
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30,000
sustainable

29,000

conservation

28,000

awareness

27,000

outreach

26,000

fuel cell

25,000

ecology

24,000

preservation

23,000

leadership

22,000

cost savings



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Introduction

Wright-Patterson Air Force Base is one of the largest and most diverse Air Force installations. Headquartered at Wright-Patterson AFB, Ohio is Air Force Materiel Command (AFMC) which conducts research and development, test and evaluations, provides acquisition management services and logistics designed to deliver war-winning capabilities to the warfighter. AFMC has delegated execution of responsibilities for weapon system acquisition to product centers of which the largest is the Aeronautical Systems Center (ASC), located at Wright-Patterson AFB, OH. ASC manages over 400 Air Force, joint and international aircraft acquisition programs and projects. It also executes an annual budget of \$19 billion and employs a work force of more than 10,600 people, located at the base and 38 other locations worldwide.

ASC Background

ASC's diverse activities support the overall mission of rapidly developing, acquiring, modernizing, and sustaining the world's best aerospace systems. ASC accomplishes this complex mission by emphasizing acquisition excellence and innovation, rapidly transitioning technology into systems and business processes, developing and retaining a high performance technical work force, and forming strong partnerships with weapon system operators and the community.

ASC is the center for new procurement of cutting-edge weapon systems, such as the F-35 Joint Strike Fighter, as well as legacy systems, such as the C-130 and B-52. Other programs managed at ASC include the B-1 and B-2 bombers, F-16, F-15, C-5, C-130J, C-17, and unmanned aircraft, such as Global Hawk, Predator, and Reaper, as well as a wide range of projects for support systems and weapon system modifications.

ASC's responsibilities also include management of the Air Forces Government-Owned, Contractor-Operated (GOCO) industrial facilities and Air Force Plants (AFPs), valued at over \$20 billion. ASC also partners with the Air Force Research Laboratories (AFRL), academia, and industry in developing vital, cutting edge technology and research opportunities in support of national defense.

Awards and Services

The Acquisition Environmental and Occupational Health Risk Management Branch (ASC/ENVV) team at Wright-Patterson has done an exceptional job in integrating Environmental Safety and Occupational Health (ESOH) considerations into the weapon system acquisition program decision making process, and has won numerous awards for their accomplishments. A total of eight team members have won awards in ESOH categories

and other categories, such as Top 100 Research and Development projects, Wing Civilian of the quarter, and the following ASC/EN Annual Awards:

Mid Career Military Engineer, Junior Civilian Engineer, Individual Technical Support, Civilian Service Achievement and Senior Civilian Engineer. These awards are a direct result of the accomplishments by the ASC/ENVV team and the recognition from senior leadership.

Merits and Accomplishments

ASC/ENVV is dedicated to reducing the ESOH risks at the Air Force (AF) GOCO weapon system industrial facilities and working with all weapon programs managed by the ASC. ASC/ENVV excelled in developing Pollution Prevention (P2) weapon system alternatives that reduce environmental risk, while enhancing production operations and improving the performance of weapon systems. The following accomplishments reflect some of the numerous projects that have been skillfully developed, coordinated, and managed by ASC/ENVV:





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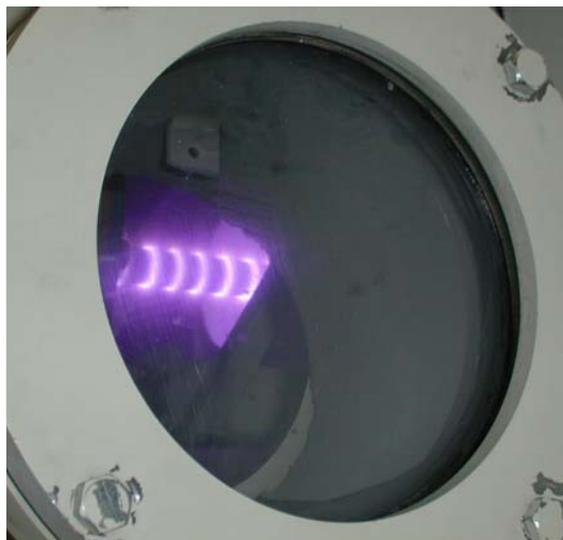
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Significant Accomplishments:

- Relentlessly pushed hydraulic fluid purification for the F-15 fleet—saving \$20M/year in stabilizer repairs
- Reformulated deicing fluid to solve material incompatibility with aircraft brake pads—saving \$800K/aircraft with over 100 aircraft in the AF inventory
- Replaced cadmium plated fasteners with titanium, eliminating the use of a hazardous wipe solvent—saving \$10M in life cycle costs (LCC) and eliminating occupational health risk to the maintainers
- Qualified sputtered aluminum for internal surfaces of C-17 landing gear at Ogden Air Logistics Center—saving \$2.5M in LCC



Hydraulic Fluid Purification The Hydraulic Fluid Purification system is being used to develop a hydraulic fluid cleanliness standard for the Air Force. This process is also being incorporated into USAF Standard Maintenance Practices (SMPs).



Certification for Sputtered Aluminum Coating

The sputtercoat process is an environmentally responsible process eliminating cadmium plating of landing gear components. Hill AFB was certified in March 2008 to use sputtered aluminum on landing gear to protect the maintenance workers and the environment from cadmium, a suspected human carcinogen known to damage kidneys.

- Educated over 1000 personnel on ESOH risk management, Programmatic Environmental Safety and Health Evaluations (PESHE) writing, basics of ESOH and statutory National Environmental Policy Act requirements (NEPA), integrating ESOH into acquisition strategy and systems engineering process-reduced acquisition ESOH risk

- Developed a Department of Defense (DoD)-wide, web-based course (SYS 196) with the Air Force Institute of Technology (AFIT). This course addresses the three distinct areas of ESOH, risk management using the DoD Standard Practice for System Safety, and MIL-STD-882D.



Deicing Current deicing and anti-icing materials for aircraft and runways are chemical oxygen depleters and harmful to the environment. New materials and processes are being actively tested and demonstrated that are environmentally friendly.



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Reformulated Deicing Fluid has provided a solution to the #1 need throughout the C-17 Program. Over a span of two years, AFMC reported over 130 instances in C-17 brake repairs. These brake repairs have an estimate of \$800K to repair brakes, not including labor.

Management of Weapon System Acquisition Program

ASC/ENVV excelled in developing alternatives that improved the environment by decreasing or eliminating pollution while enhancing production operations and improving weapon system performance. Identifying ESOH risks, documenting those risks, and mitigating the associated risks through systems engineering to help deliver a more environmental friendly, efficient, cost-effective weapon system to the end user is an important aspect of our job within the acquisition community. ASC/ENVV's unrelenting focus is to support the overall ASC mission by reducing the ESOH burden and LCCs to the weapon system acquisition process and ensure compliance with all ESOH laws, rules and regulations throughout the weapon system life cycle.

A successful portion of our management team has been the collaboration with the AFP's Integrated Production Teams (IPTs) to ensure that they reduce pollution and are in environmental compliance. The four AFPs are AFP 4 (Fort Worth TX), AFP 6 (Marietta GA), AFP 42 (Palmdale CA), and AFP 44 (Tucson AZ). AFP 4 and AFP 6 support programs, such as the F-16, F-22 Raptor, F-35, C-5B, and C-130J. AFP 42 provides maintenance and modification of aircraft, such as the B-2 and production of the Global Hawk and other unmanned aircraft. AFP 44 produces over 40 different missile systems, including the Advanced Medium-Range Air-to-Air Missile (AMRAAM); Sidewinder and Sparrow missiles; Stinger, Javelin, and TOW land combat missiles.

Developing a program that provides superb P2 acquisition training, relentless teaming efforts in joint projects and environmental needs, and maintaining the ability to cross-feed information to excel the environmental programs of each weapon system has required a dynamic team approach that involves all players from design through production, interfaces contractor expertise and results in maximum use of limited P2 funds. These established partnerships have allowed our team to successfully implement a hydraulic fluid purification system for the F-15 fleet that will save \$20 million a year in

stabilizer repairs, successfully demonstrate a hydrogen fuel cell-powered tow tug that reduces greenhouse gas emissions by 60%, and qualify sputtered aluminum for internal surfaces of the C-17 landing gear that saved \$2.5 million in LCC. Each technology is designed to reduce pollution, improve system performance, ensure worker safety, reduce costs and enhance production efforts while the resulting products are cross-fed to assist others with their environmental challenges. The P2 team employs "outside the box" thinking and team members are integrated throughout the acquisition process to ensure pollution prevention is addressed at every stage of the weapon system life cycle.



Fuel Cell Tug The Fuel Cell Tow Tug is a zero emission vehicle and the only one of its kind. This program demonstrated a significant reduction of waste streams from lead and acid battery to gas and diesel powered CO emitting vehicles. This F-16 demonstration was done at Springfield ANG.



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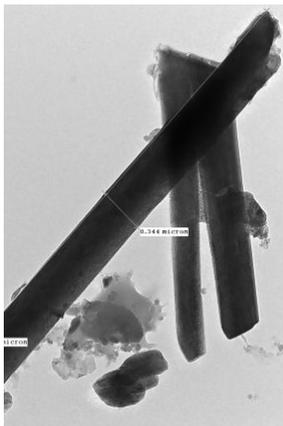
Achieving Mission Sustainability

Mission sustainability is the mainstay of our acquisition weapon system program that promotes, encourages, and develops a superbly managed weapon system environment. As a result, our program offices and AFPs rely on our distinctive acquisition knowledge and training that will guide their weapon system programs through a sustainable, DoD-leading acquisition program. Developing a program that relies on risk management and implementing a strong foundation in reducing ESOH risks throughout weapon systems is a vital part of our program.

Throughout the acquisition community, the emergence of technologies and contaminants must be a vigilant component of our mission sustainability. In order to comply and stay ahead of the environmental needs of our weapon systems, ASC/ENVV often is at the forefront of providing P2 solutions. These actions are often developed within the collaboration and teaming efforts of our program offices and AFPs.

Nanomaterial Baseline Study

In order to minimize our risks and increase our sustainability within the program offices and AFPs, our team developed a nanomaterial baseline study to capture



Nanomaterial Baseline Study Pictured is a carbon-nanotube from the research conducted by ENVV and the University of Dayton Research Institute. Engineered nanomaterials have a number of attractive benefits for current and future applications. Both the physical and chemical properties of nanostructures offer valuable alternatives to more traditional resources.

manufacturing effects, exposure levels, and uses in the weapon system. In doing so, our team has been at the forefront of evaluating nanomaterials risks and evaluating the concerns for future benefits within the AF and DoD. These efforts will provide environmental managers, chief engineers, and the surrounding acquisition community with the knowledge they need in reducing ESOH risks within the weapon system.

Replacement of Cadmium Plated Fasteners

In addition to hazmat risk analysis, our team led the C-130 Avionics Modernization Program to replace cadmium plated fasteners with titanium fasteners. A further benefit is the elimination of trichloroethane and methyl ethyl ketone wipe solvents. This project saved an estimated \$10M in LCC and reduced ESOH risks at the same time.

Advanced Performance Coating

In the past two years, the AFPs have greatly reduced their Volatile Organic Compounds (VOC's), LCC's and Toxics Release Inventory (TRI) discharges. A great example of this is the implementation of an Advanced Performance Coating (APC) topcoat on the C-17 program. This topcoat reduced repainting and in turn reduced hazmat use and LCC by \$450K per year.

Alternative for Nitric Acid Cleaning

In addition to providing the AFPs with a reduction in VOCs, our team also managed an industry alternative for Nitric Acid cleaning and reduced TRI discharges by 75%. This alternative has been considered the aerospace solution for stainless steel passivation by the Society of Automobile Engineers.



Advanced Performance Coating Prior to implementing APC topcoat, C-17 had to repaint planes every 2 – 3 years. Since implementing APC, the C-17 is now only repainted every 5 years. This results in less stripping and repainting of the aircraft, saving the C-17 \$117M over its life cycle and generates less hazardous waste.



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Low VOC Topcoat

Work was carried out to qualify and implement low or zero VOC temporary protective coatings for use on the C-130 production aircraft during periods of outdoor storage when required prior to paint. Candidates were evaluated in shop trials on production skin panels, field tested, and flight tested.



Internal Coordination of ESOH into Systems Engineering

Incorporating ESOH into systems engineering is an essential step accomplished by ASC/ENVV that greatly reduces the risk of ESOH in weapon systems. ASC/ENVV is a vital member of the ASC Acquisition Strategy Panel (ASP) that reviews each weapon system program to ensure a solid strategy is in place that will deliver a product or service within cost, on schedule and meet the operator's performance goals. The program must be tailored to clearly describe the strategy options considered, the pros and cons of these options, and the logic that leads to the recommended option/strategy. ASC/ENVV puts environmental considerations at the beginning of the acquisition process, which allows for more successful mitigation of ESOH risks through the systems engineering process.

In addition to playing a vital role in the ASC/ASP, ASC/ENVV demonstrates a genuine role in integrating systems engineering into the ESOH acquisition program. These efforts are successful through the quarterly focus week that is conducted at ASC. ASC/ENVV provides invaluable information to environmental managers, critical engineers, and base-wide acquisition personnel through introductory courses in Environmental Acquisition, PESHE, and hands-on Programmatic Risk Training (PRT). These courses lay the foundation for acquisition personnel that require the abundance of knowledge that is required for a successful weapon system program. To this date, ASC is the only product center that provides a focus week that is centered on reducing ESOH risk and internally coordinating a strategy to share knowledge and experiences among their acquisition professionals.

The development and deployment of several checklists and circulars to Wing environmental managers has also served as an integral part of our internal integration. These include the NEPA circular, a PESHE Checklist, and an ESOH circular. The documents provide guidance and support to environmental managers by incorporating the most current information from regulations, instructions (both AF and DoD), and policies.

ASC/ENVV also developed an ESOH computer-based PRT tool to raise awareness in ESOH related requirements for Wing personnel. The ESOH PRT focuses the user on the NEPA and PESHE requirements needed for managing the ESOH processes in acquisition and systems engineering via hands-on, interactive computer modeling systems. Tools like the ESOH PRT enable a systematic approach to identify and communicate ESOH-related risks to the weapon system program managers, chief engineers, director of engineering and environmental managers at the Wings. These findings result in cost savings by highlighting risks that will occur if the managers fail to properly manage the ESOH aspects of their program throughout the life cycle of a weapon system. These ESOH tools have been lauded by the Secretary of the Air Force – Acquisition (SAF/AQ) as being highly effective ways in reducing ESOH risks during the many facets of the acquisition process.

ASC/ENVV also identifies P2 requirements at the GOCOs and in the system program offices through an annual data call. The data call is the initial step in an annual process that begins with several Technical Interchange Meetings to communicate progress on ASC/ENVV's portfolio of projects and to share needs and requirements that may have environmentally advantaged solutions. Through the cross-feed of this information, the GOCOs and Wings are offered multiple opportunities to have their



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ESOH considerations addressed in the overall ASC environmental program.

ASC/ENVV manages these tools through their Air Force Knowledge Now Community of Practice and a SharePoint site. These websites create a one-stop location for ASC environmental assets to stay informed and become more familiar with ESOH requirements mandated by regulations and policy.



Nano Conference First USAF Workshop on Biological Interaction of Engineered Nanomaterials: Environmental, Safety and Health Issues of Military Concern. This workshop provided attendees from across the world the opportunity to receive an abundance of knowledge in areas such as Environmental, Safety, and Occupational Health. This workshop provided chief engineers, program managers, and ESOH professionals the opportunity to be at the forefront of nanomaterials and their effects.

In addition to our team providing an abundance of tools and internal coordination efforts, our efforts also extend to the following:

- Conducted technical information meetings to identify P2 needs, identified & demonstrated, qualified “next generation” technologies to address P2 & operational requirements and reduce/eliminate ESOH risk with program offices
- Conducted health risk assessment to consider occupational health risks of material substitutions
- Teamed with the Aeronautical Systems Center Capabilities Integration Directorate (ASC/XR) program planning to integrate ESOH criteria into system design and program strategy
- Spread the ESOH “grassroots” message through briefing to ASC functional, ASC Acquisition Office & the ASC ESOH council
- Teamed to ensure ESOH risks are properly managed in ASC Program Executive Office’s (PEO) \$23 billion weapon system portfolio
- Educated over 1000 personnel on ESOH risk management, PESHE writing, basics of ESOH, and statutory NEPA requirements and integrating ESOH into acquisition strategy and system engineering process.

External Coordination and Outreach

Understanding that education is the key to success, ASC/ENVV organizes worldwide outreach efforts through conferences, seminars and workshops presenting technical papers, briefings and education and training sessions. This outreach effort shares valuable information and provides networking efforts to personnel with backgrounds in engineering, occupational health & safety, physics, chemistry and biology.

One of the most effective ways that our team extended our knowledge within the acquisition community was by conducting the “First USAF Workshop on Biological Interaction of Engineered Nanomaterials”. This workshop was provided in a joint effort by ASC/ENVV and AFRL with the intent of consolidating the nanomaterial baseline study project by ASC/ENVV and toxicology efforts by AFRL to increase the awareness and knowledge of nanomaterials to acquisition environmental managers, chief engineers, and personnel associated within the acquisition process. Awareness to these individuals provided the weapon system acquisition community the knowledge to minimize ESOH risks on the weapon system and the ability to stay ahead of the impacts of nanotechnology.



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In addition to providing a nanomaterial baseline study, our team successfully managed a Phase II Small Business Innovation Research program which is launching an AF website on emerging nanomaterials and their potential ESOH risks. This website provides end users across DoD and other national laboratories with “hard to find” data that is needed when evaluating materials within the manufacturing process.

ASC/ENVV partnered with AFIT to provide a web-based course for acquisition and sustainment personnel that is available DoD-wide. This course addresses the three distinct areas of ESOH, risk management using the DoD Standard Practice for System Safety, and MIL-STD-882D. Improving the students understanding of ESOH regulatory drivers and PESHE requirements helps ensure the integration of ESOH into systems engineering and the acquisition strategy.

This type of networking resulted in personnel obtaining a firm grasp on the current and future ESOH impacts on the acquisition weapon system and on the regulations or standards used to mitigate ESOH risk. Finally, this effort sheds light on current risks and potential problems which may become a reality in the future. Without this outreach



ASC/ENVV Team

Front Row: Megan Hawk, Kelly McNamara, Roddy Keish

Middle Row: Martha Vaillancourt, Brian Tobin, Tim Sumpter

Back Row: Scott Murphy, Chuck Valley, Donald Streeter, Tom McDonald, Don Tarazano, Pete Lurker

Not Pictured: Lavera Floyd, Ted Grady, Tim Kalt, Kenneth Kessler, Joseph Leone, William LaFountain, Gene McKinley, Ray Malinovsky, Major Ted Sotoropolis, John Stallings, Mary Wyderski

effort, personnel would not obtain a firm understanding related to what they need to do to improve the current ESOH standards on the weapon system and reduce the current ESOH burden.

Conclusion

The Aeronautical Systems Center 77th AESW, Acquisition Environmental and Occupational Health Risk Management Branch (ASC/ENVV) is focused on and highly effective in ensuring environmental awareness throughout the weapon system acquisition process. The team continually reaches out to manufacturers, engineers, acquisition program managers, scientist and environmental experts, providing P2 solutions that make a real difference. The ASC/ENVV team continues to excel in protecting weapon system developers, operators and maintainers across DoD and our nation from environmental hazards.

Team Background & Position Descriptions

The ASC/ENVV team is composed of 21 team members that support and advance environmental advantages to end users throughout the acquisition community. These team members provide ESOH considerations, P2 material substitutions, and incorporate programmatic ESOH risks into the weapon system acquisition programs here at WPAFB. These team members are:

- | | |
|------------------------|--------------------------|
| Mr. Tedmond Grady* | Mr. Gene McKinley |
| Mrs. Lavera Floyd | Ms. Kelly McNamara |
| Ms. Megan Hawk | Mr. Scott Murphy |
| Mr. Timothy Kalt | Major Ted Sotoropolis |
| Mr. Roddy Keish | Mr. John Stallings |
| Mr. Kenneth Kessler | Mr. Donald Streeter |
| Mr. William LaFountain | Mr. Timothy Sumpter |
| Mr. Joseph Leone | Mr. Donald Tarazano |
| Mr. Thomas Lorman | Mr. Brian Tobin |
| Mr. Peter Lurker | Mrs. Martha Vaillancourt |
| Mr. Raymond Malinovsky | Ms. Mary Wyderski |
| Mr. Thomas McDonald | |

* Branch Chief — Team Lead