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AF/DPS 14-172

US CITIZEN

TS/SCI

RETIRE AS BRIG GEN WITHIN 120 DAYS OF NOTIFICATION



## D. NEAL BARLOW, PhD

Dean, Chair, Vice Provost and Professor, Acting Chief Scientist

Col, USAF, Jun 2000, retirement eligible as Brig Gen

### SUMMARY

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*Senior leader and educator. Teaching, research and administrative experience as a **Permanent Professor and Department Head** of the largest engineering department at the United States Air Force Academy (USAF) to include oversight of faculty development, curriculum development and accreditation, budget, research, laboratory facilities, and strategic planning with additional leadership responsibilities as the Head of the Aero Research, and Modeling & Simulation Research Centers conducting DoD and NASA basic and applied research. Twice led comprehensive curriculum reviews for the University President resulting in major core curriculum transformations. As the **Vice Dean of the Faculty (Vice Provost)**, supported the Dean (Provost) in leading a 700-member faculty in 19 academic departments and 5 staff agencies while directly supervising the Budget Officer, Director of Education, Director of Library, and the Registrar. As **Engineering Division Chair at the United States Air Force Academy (Dean of Engineering College equivalent)** led curriculum development, national-level program accreditation, budget and strategic planning for the 5-department, 10 major, engineering division as well as oversight of 6 research centers. Led the first major effort in two decades to understand and plan for needed building, commons and laboratory requirements (FACTS 2030). Elected by 35,000+ membership of the American Institute of Aeronautics and Astronautics (AIAA) as the **Vice President of Education and to the Board of Directors** to oversee institute committee activities in K-12 STEM outreach, undergraduate and graduate college student awards, scholarships, & competition activities, professional member education activities, and academic activities focused on ABET accreditation for national and international aerospace undergraduate and graduate college programs while reporting to the Board on all education committee activities, strategic planning and budget matters. In 2012, elected as a current Director at Large on the AIAA Board. By appointment, serve on the Board of Education for a local K-12 school district. During Air Force career, was entrusted with the command of a **flying squadron, support squadron, a base in Kuwait, and the International Zone (Green Zone) in Baghdad, Iraq**. Served as the **Acting Chief Scientist** for the US Air Force's Space Command advising the Commander on technical and scientific matters. **AIAA Fellow**. **ABET Program Evaluator**.*

### EDUCATION

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2009	Harvard Graduate School of Education Institute for Management and Leadership, Higher Education	Boston, MA
1991 - 1994	Arizona State University Doctor of Philosophy, Aerospace Engineering	Tempe, AZ
1983 - 1984	University of Washington Master of Science, Aeronautics and Astronautics Engineering	Seattle, WA
1974 - 1978	United States Air Force Academy Bachelor of Science, Aeronautical Engineering	Colorado Springs, CO

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## **WORK EXPERIENCE**

### *2014-Pres United States Air Force Academy, CO, Brig Gen Andy Armacost*

#### **Associate Dean (Assoc Provost) for the Core Curriculum; Permanent Professor & Head, Dept of Aeronautics**

As Associate Dean currently directing a 50-year curriculum review and redesign responsible for proposing the most sweeping changes in the Academy's 100+ hour core curriculum to best prepare graduates to meet Air Force and National needs. As Department Head, direct a 50+ member department operating 3 research centers (\$5M+) in support of the Academy's largest engineering program. Developed and serve on the oversight board for the Academy's K-12 STEM Outreach Center.

**2013-Present, Director at Large, AIAA Board of Directors** – Elected by 35,000+ membership to oversee all Institute activities to include: strategic planning, mission, budget, personnel, and conference planning.

**2008- Present, Academy School District 20 Board of Education (K-12)** - Liaison Appointed by USAFA Superintendent in 2008 to fill District Charter position on Board of Education: represents military families on all issues that come before the bimonthly Board meetings, advises Board on all issues before it including curriculum, budget, logistics and personnel.

**2007- Present, ABET Accreditor**, AIAA sponsor, Aerospace programs, 7 visits

### *2013 - 2014 US Air Force Space Command, CO, Gen William L Shelton*

**Acting Air Force Space and Cyberspace Chief Scientist.** Served as the primary adviser to the commander on all scientific and technical matters concerning space and cyberspace research and development programs. Represent Space Command on science and technology decisions, high-level planning, and policy throughout the U.S. government, industry, academia, the international community, and other scientific and technology organizations at venues that affect the command. Served on the DoD and Air Force Space Test Program Boards determining the priorities for support and spending from DoD and the Air Force.

### *2000 – 2013 United States Air Force Academy, CO, Brig Gen Dana Born*

#### **2008-2013 Chair, Engineering Division, and Permanent Professor and Head, Department of Aeronautics**

As Engineering Division Chair (Dean of the College of Engineering equivalent), led curriculum development, national-level program accreditation, and strategic planning for the five-department Engineering Division. Oversaw personnel hiring and professional development along with budget planning and execution (200+ faculty and staff). Oversight includes 6 Research Centers and the associated diverse engineering and education activities. Headed a 50-year curriculum review that promises to make the most sweeping changes in the Academy's 100+ hour core curriculum to best prepare graduates to meet Air Force and National needs. Voting Member of Academy Board, USAFA's most senior governing board. Developed and received Charter for the Academy's new K-12 STEM Outreach Center.

**2008-2013 Vice President of Education for the American Institute of Aeronautics and Astronautics (AIAA)** -Elected by membership to Board to oversee Institute committee activities in K-12 STEM outreach, undergraduate and graduate college student award, scholarship, and competition activities, professional member education activities, and academic activities focused on ABET accreditation for national and international aerospace college programs.

**2006 – 2008 Vice Dean of the Faculty, (Vice Provost equivalent)** Led and managed the 700-member Dean of the Faculty mission element in the Dean's (Provost equivalent) absence. Responsible for daily operation of 19 academic departments, 5 staff agencies, a \$7.3M operating budget and a \$300M facility. Directly supervised the Budget Officer, Director of Education, Director of Library, and the USAFA Registrar. Chaired, Superintendent's Preparatory School Advisory Committee and Officer Representative for the Football Team.

#### **2004 – 2005 Commander (Director), Joint Area Support Group, Multi-National Forces-Iraq, US Embassy**

**Baghdad, Iraq** - Directed the activities of Army, Air Force, Navy, Marine and Coalition Contractor Personnel along with DoD and Iraqi Civilian Personnel in direct support of the US Embassy in Baghdad and the Commander Coalition Forces Iraq. Supported operations in a combat zone for 3000+ US State and DoD Personnel assigned to the US Embassy Compound in Baghdad. As the Mayor of the International Zone (Green Zone), oversaw the Security, Public Works and Property Management of the Iraqi Government national zone which includes the offices and living area of the Interim Iraqi Government, 11 Embassies, the 3rd Brigade Combat Team, a Contingency Army Support Hospital, Iraqi Management Contract Office, the Iraqi Convention Complex and Hotel, and numerous prime and sub-contractors, along with Iraqi Residents totaling over 30,000 inhabitants. Managed an annual budget of \$110M and contracts worth over \$400M.

**2000-2004 Permanent Professor and Head, Department of Aeronautics**, responsible for the command and leadership of USAFA's largest engineering department: 42 personnel, \$.5M budget, \$60M lab assets. Included oversight of curriculum development, personnel, budget, research, laboratory facilities, and strategic planning. Responsible for continued development and execution of university-level accredited aeronautical engineering education program. Directed

fluid and thermal sciences portion of accredited mechanical engineering education program. Head of the Aeronautics Research Center and chartered new Modeling and Simulation Center that together conduct over \$3 Million of annually funded and in-kind DoD and NASA basic and applied research. Garnered USN&WR's #2 National ranking.

**1999-2000 Deputy Commander, 34th Operations Group**

Directed, formulated, and controlled training operations of two flying squadrons and an operational support squadron. Generated 60,000 soaring and 15,000 parachuting sorties, utilizing 101 aircraft and 300 instructor pilots/jumpmasters to support a student load of 2,800 cadets. Oversaw a \$3.5M maintenance contract. Instructor & evaluator TG-7 & T-41.

**1998-1999 Commander, 94th Flying Training Squadron**

Led 300 officers, cadets and civilian personnel conducting 50,000 sorties annually in glider and powered aircraft. Directed, formulated, and controlled operational flight training operating a fleet of 39 aircraft of 7 different types. Lead National Intercollegiate Flying Association Cadet Competition Team. Maintained dual instructor qualification in TG-7 and T-41s.

**1997 Commander, 4417th Support Sqdrn, Ali Al Salem Air Base, Kuwait**

Led squadron and US-Site for 320 airmen at the most forward-based Air Force site in the Joint Task Force Southwest Asia Area of Responsibility. Command responsibilities included security forces, civil engineering, education, services, logistics, medical, contracting, and finance functions.

**1994 – 1997 United States Air Force Academy, Colorado Springs, CO**

**1996-1997, Associate Professor of Aeronautics, Director of Resources, Propulsion Sequence Director** - Supervised all Department of Aeronautics financial resources, Discipline Director for propulsion curriculum, course director for both senior-level propulsion courses, lead instructor and course developer of an experimental, problem based, Introduction to Engineering course for freshmen. Academic Advisor. Mentor for two cadet squadron commanders. T-3A Instructor Pilot.

**1994-1996 Assistant Professor of Aeronautics, Division Chief, Director of Research, Director of Resources** -

Supervised Department of Aeronautics research, supervised four professors, one NCO, and two civilians. Discipline Director for propulsion curriculum, Academic Advisor for students majoring in Aeronautical Engineering, T-3A IP.

**1991 - 1994 Graduate Student, Arizona State University Tempe, AZ**

PhD Student (AFIT Liaison Officer), completed PhD in Aerospace Engineering. Dissertation, "The Effect of Surface Roughness and Local Film Cooling Effectiveness and Heat Transfer Coefficients," was conducted in response to an Air Force need to understand life cycle problems with the Pratt and Whitney F-100 engine. Liaison Officer for 35 officers.

**1988 – 1991 Randolph AFB, San Antonio, TX, Maj Gen Sam W Westbrook**

**1990-1991, T-38 Command Flight Examiner, HQ Air Training Command (ATC)**, established command standardization and evaluation requirements. Provided guidance and conducted evaluations for the ATC Commander in the following programs: Pilot, Navigator, Helicopter, and Space Training; Instructor Training; Euro-NATO Jet Training; Crew Survival.

**1988-1990, Instructional Program Developer, 3305th School Squadron, HQ ATC**, responsible for the Aerodynamics courses taken by all Undergraduate Pilot Training (UPT) students and instructor pilots. Co-Author of new aerodynamics text and workbook, Author of new instructor guide for UPT aeronautics instructors. Pilot Instructor Training IP (T-38).

**1985 - 1988 Assistant Prof of Aeronautics, United States Air Force Academy, Colorado Springs, CO** Department of Aeronautics, Lead Professor for the Propulsion track of the Aeronautics major. Executive Officer for the Department of Aeronautics' Department Head, Junior Officer of the Year, Recipient of the William P. Clements Award as an Outstanding Military Educator, Assistant Air Officer Commanding of Cadet Squadron 02, T-41 Instructor Pilot.

**1983 – 1984 Graduate Student, University of Washington, Seattle, WA**

Graduate Student, Department of Aeronautics and Astronautics, MS earned in Aeronautical and Astronautical Engineering as an Order of Daedalian Fellow, one fellowship awarded to the Armed Forces each year for studies in aerospace engr.

**1980 – 1983 T-38 Instructor Pilot, Williams AFB, Phoenix, AZ**

T-38 Instructor Pilot, 97th Flying Training Squadron, trained and educated undergraduate pilot training students in Air Force's advanced trainer (T-38). 97FTS - Instructor Pilot of the Year, Chosen as "Outstanding Instructor" by students of four UPT classes. Flight Commander, Remote Supervisory Unit Controller, Supervisor of Flying.

**1980 T-38 Pilot Instructor Training Student, Randolph AFB, San Antonio, TX**

560 Flying Training Squadron, Top Graduate Award.

**1978 – 1979 Undergraduate Pilot Training student, Williams AFB, Phoenix, AZ**

Distinguished Graduate and Air Training Command Award.

## **AWARDS**

1977 Aero Propulsion Laboratory Commander's Award  
1978 Distinguished Graduate, USAF Academy  
1978 Top Graduate in Thermodynamics and Propulsion, Class of 1978  
1979 Distinguished Graduate - Air Force Undergraduate Pilot training  
1980 Top Graduate from T-38 Pilot Instructor Training  
1982 97FTS, Instructor Pilot of the Year  
1983 Order of Daedalian Fellow, University of Washington  
1986 Junior Officer of the Year, Department of Aeronautics, USAFA  
1987 William P. Clements Award as an Outstanding Military Educator  
1996 557FTS - Attached Instructor Pilot of the Quarter, Jul-Sep 96  
2007 Dr Heiser Award Engr Div Finalist-Student nominated/selected  
2008 Dr William Heiser Award Engineering Division Finalist  
2013 Dr William Heiser Award Engineering Division Finalist  
2013 American Institute of Aeronautics and Astrodynamics Fellow

## **MAJOR MILITARY DECORATIONS:**

Legion of Merit  
Bronze Star  
Meritorious Service Medal with three oak leaf clusters  
Air Force Commendation Medal  
Armed Forces Expeditionary Medal

## **PROFESSIONAL REFERENCES**

Dr. Mark J. Lewis, Director  
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## **FAMILY**

Diana (Married 1978)  
Son-Maj Ben Barlow, MD;  
Daughters-Capt Kaitlin Lee, DDS & Ms Caralyn Barlow, MBA

## **Publications**

Numerous presentations on leadership and education topics - Presentations to civic, student, educators and government groups on a variety of leadership and education topics

1. Barlow, D. N. and Wood, C. W., "Airbreathing Propulsion System Design at the United States Air Force Academy - An Integrated Approach," 1987, AIAA Paper 87-1870.
2. Barlow, D. N., Wood, C. W., and Harvell, J. K., "Lessons Learned - An Integrated Approach to Airbreathing Propulsion Design at the United States Air Force Academy," 1988, AIAA Paper 88-2975.
3. Barlow, D. N., Maj, James, D., Maj, and Barnes, S., Capt, 1989, "T-38 Applied Aerodynamics," United States Air Force Air Training Command P-V4A-B-AA-SG, Randolph AFB, TX, June 1989.
4. Oliver, R.B., Larson, E.L., and Barlow, D.N., 1990, chapter 6.5 "Propulsion," Eshbach's Handbook of Engineering Fundamentals, 4th ed., edited by Tapley, B.D., Wiley and Sons, Inc., New York, 1990.
5. Barlow, D. N., 1994, "Effect of Surface Roughness on Local Film Cooling Effectiveness and Heat Transfer Coefficients," PhD Dissertation, Arizona State University.
6. Barlow, D. N. and Kim, Y. W., 1995, "Transient Liquid Crystal Technique Convective Heat Transfer on Rough Surfaces," presented at the ASME International Gas Turbine Institute Conference in Houston, TX, June 1995, ASME 95-GT-6, accepted for publication in ASME Journal of Turbomachinery. (Refereed Publication)
7. Barlow, D. N. and Kim, Y. W., 1995, "Effect of Surface Roughness on Local Heat Transfer and Film Cooling Effectiveness," presented at the ASME International Gas Turbine Institute Conference in Houston, TX, June 1995, ASME 95-GT-14.
8. Barlow, D.N., Havener, G.A., Kouri, J.V., Marlino, M.R., and Smith, M.L., 1996, "Project Falcon Base: A Freshman Engineering Experience," presented at 1996 ASEE Annual Conference, Session 2653, Washington D.C., June 1996.
9. Barlow, D.N., Havener, A.G., Kouri, J.V., Smith, M.L., and VanTreuren, K.W., 1996, "Project Falcon Base : A Freshman Problem Based Learning Engineering Experience," presented at the SAE/AIAA World Congress in Los Angeles, Oct 1996, AIAA Paper 96-5531.
10. Barlow, D. N., Kim, Y. W., and Florscheutz, L.W., 1997, "Effect of Surface Roughness on Local Heat Transfer and Film Cooling Effectiveness," ASME Journal of Turbomachinery, Vol. 119, January 1997.
11. VanTreuren, K.W., Barlow, D.N., Heiser, W.H., and Wagner, M., 1997, "Investigation of Vapor-Phase Lubrication in a Gas Turbine Engine," presented at the ASME International Gas Turbine Institute Conference in Orlando, FL, June 1997, ASME 97-GT-3
12. Welsh, S., Barlow, D.N., Byerley, A., Baughn, J., Butler, R.J., Van Treuren, K.W., and Rivir, D., 1997, "Effect of Passive and Active Air-Jet Turbulence on Turbine Blade Heat Transfer," presented at the ASME International Gas Turbine Institute Conference in Orlando, FL, June 1997, ASME 97-GT-131.
13. VanTreuren, K.W., Barlow, D.N., Heiser, W.H., Wagner, M. and Forster, N.H., 1998, "Investigation of Vapor-Phase Lubrication in a Gas Turbine Engine," ASME Journal of Engineering for Gas Turbines and Power International, Vol. 120, pp 257-262, April 1998.

14. Barlow, D., Nowlin, S., and Bossert, D., "Falcons Soaring: USAFA Department of Aeronautics Contributions to Aerospace Power During a Century of Manned Flight," presented at 40th AIAA Aerospace Sciences Meeting and Exhibit, 15 Jan 2002, Reno, Nevada, AIAA paper 2002-0564.
15. Havener, A. George, and Barlow, D. Neal, "Project Falcon Base: A Freshman Introduction to Engineering Using Problem Based Learning," presented at 2002 ASEE Annual Conference Multimedia And Exhibition, Montreal, Canada, Session 2793, June 2002.
16. Haven, B., Byerley A., and Barlow D.. "An Undergraduate Gas Turbine Engine Program Enhanced by Design and Research Threads." Proceedings of ASME TurboExpo 2002, GT- 2002-30588, June 2002.
17. Havener, A. George, and Barlow, D. Neal, "ABET EC2000 Evaluation of the Aeronautical Engineering Program at the United States Air Force Academy," presented 2003 American Society for Engineering Education Annual Conference and Exposition, June 2003, Nashville, TN, Session 2003 267.
18. Barlow, D., Nowlin, S., and Bossert, D., "Falcons Soaring: USAFA Department of Aeronautics Contributions to Aerospace Power During a Century of Manned Flight," chapter 45, Aerospace Education in America During 100 Years of Human Flight, 2004, AIAA Educational Series.
19. Bartolomei, Jake E. and Barlow, D. Neal, "CadetSIM: A System Dynamic Simulation of Cadet Life at the United States Air Force Academy," 2004 ASEE Annual Conference and Proceedings, June 2004.
20. Barlow, D., McLaughlin, T., and Wisniewski, C, "Undergraduate Educational Research Activities and Opportunities in Aeronautical Engineering at The United States Air Force Academy," ICEE 2011, Belfast, Northern Ireland, Paper 292, Aug 2011.
21. Cummings, R., McLaughlin, T., and Barlow, D., "Supersonic Research Facilities and Opportunities at the United States Air Force Academy," ICEE 2011, Belfast, Northern Ireland, Paper 309, Aug 2011.
22. Greene, K., Barlow, D., and Cunningham, T., "Creating a Curriculum Based on Engineering Needs," International Network for Engineering Education and Research, INEER Innovation Series Special Volume 2012, Paper 12-039, Turku, Finland, July 2012.
23. Stiles, R. and Barlow D., "The Physics and Meaning of Flight: A Case Study in Institutional Connections and Innovative Teaching Using Technology," Educause Review Online, Oct 2013.