FAA

Centers of Excellence

Program Overview

Presented by: Patricia Watts, Ph.D.
National COE Program Director
Date: October 19, 2006
COE PROGRAM OVERVIEW

Legislative Authority
COE Oversight
Geographic Distribution
University Members
Other COE Affiliates
Funding
Program Office
Results
Administration
COE Benefits
Attachment: Established Centers
Role of Industry Partners
Legislative Requirement and Outcomes
LEGISLATIVE AUTHORITY

Omnibus Budget
Reconciliation Act of 1990
Public Law 101-508
Title IX – Aviation Safety
and Capacity Expansion Act

“The Administrator may make grants to one or more colleges or universities to establish and operate several regional centers of air transportation excellence, whose locations shall be geographically equitable. The responsibilities of each regional center shall include, but not be limited to, the conduct of research concerning airspace and airport planning and design, the air transportation environment, aviation safety and security, the supply of trained air transportation personnel including pilots and mechanics, and other aviation issues pertinent to developing and maintaining a safe and efficient air transportation system….each center may make contracts with nonprofit research organizations and other appropriate persons....”
FAA Air Transportation
Centers of Excellence Oversight

1992-1996 Congressional Mandate
$3M Earmark

Comp Modeling of Aircraft Structures
Rutgers/GIT
16 Tasks $10M*

1995 FAA COE Program Manager
AAR-400

Airport Technology
Formerly Pavement
U. of Illinois
ERAU/Rensselaer
30 Tasks 3 Task Monitors $13M*

1996 FAA COE Program Manager
NEXTOR
Operations Research
UC-B/MIT/UMD
VA Tech/GMU
100 Tasks 31 Task Monitors $43M**

1997 FAA COE Program Manager
AAR-400
Airworthiness Assurance
31 Universities
300 Tasks 30 Task Monitors $125M**

1997 FAA COE Program Manager
AAR-400

2001 FAA COE Program Manager
AAR-400

General Aviation Assurance
ERAU/WISU/UND/UAilaska/FAMU
100Tasks 10 Task Monitors $17M**

2001 FAA COE Program Manager
AAR-400

Aircraft Noise & Aviation Emissions
MIT/BSU/FIU/PS/PU/SU/UCF/UMR/GIT
30 Tasks 7 Task Monitors $17M**

2003 FAA COE Program Manager
AAR-400

Advanced Materials
UW/WSU/NWU/PUIID/UCLA
TU/OSU/WSU/ECC
20 Tasks 4 Task Monitors $11M*

2003 FAA COE Program Manager
AAR-400

Airliner Cabin Environment
AU/HU/PU/BSU/KSU/UCB/UMDNJ
12 Tasks 3 Task Monitors $21M*

* All dollar amounts quoted reflect grant awards and include matching funds.
** All dollar amounts quoted reflect grant awards, matching funds and contracts.
FAA COE GEOGRAPHIC DISTRIBUTION

AIRLINER CABIN ENVIRONMENT RESEARCH
Auburn University – Administrative Lead
Harvard University – Technical Co-Lead
Purdue University – Technical Co-Lead
Boise State University
Kansas State University
University of California at Berkeley
University of Medicine & Dentistry of New Jersey

AIRPORT TECHNOLOGY
University of Illinois - Lead
Emory-Riddle Aeronautical University
North Carolina A&T
Northwestern University
Rensselaer Polytechnic Institute

GENERAL AVIATION
Emory Riddle Aeronautical University – Lead/Prime
Florida A&M University
University of Alaska
University of North Dakota
Wichita State University

ADVANCED MATERIALS
University of Washington/ Wichita State University/
Edmonds Comm. College
Northwestern University
Purdue University
Oregon State University
Tuskegee University
University of California at LA
University of Delaware
Washington State University

NOISE AND EMISSIONS MITIGATION
Massachusetts Institute of Technology - Lead
Boise State Univ.
Florida International Univ.
Penn State Univ.
Purdue Univ.
Stanford Univ.
Univ. of Central Florida
Univ. of Missouri-Rolla

AIRWORTHINESS ASSURANCE
31 Equal University Partners

OPERATIONS RESEARCH
Co-Leads
University of California at Berkeley
Massachusetts Institute of Technology
University of Maryland
Virginia Polytechnic Institute
George Mason University
COE UNIVERSITY MEMBERS

Air Force Institute of Technology
Arizona State University
Auburn University
Baylor University
Boise State University
Carnegie Mellon University
Edmonds Community College
Embry-Riddle Aeronautical University
Florida Agricultural & Mechanical University
Florida International University
George Washington University
George Mason University
Georgia Institute of Technology
Harvard University
Iowa State University
Johns Hopkins University
Kansas State University
Lehigh University
Massachusetts Institute of Technology
Mississippi State University
Naval Post Graduate School

New Jersey Institute of Technology
North Carolina A&T University
Northwestern University
Ohio State University
Ohio University
Oklahoma State University
Oregon State University
Pennsylvania State University
Princeton University
Purdue University
Rensselaer Polytechnic Institute
Rutgers University
San Jose State University
St. Louis University
Stanford University
SUNY at Buffalo
Tuskegee University
University of Alaska
University of Arizona
University of California at Berkeley
University of California at Los Angeles
University of California at Santa Barbara

University of Central Florida
University of Dayton
University of Delaware
University of Illinois Urbana Champaign
University of Maryland
Univ. of Medicine & Dentistry of NJ
University of Michigan
University of Minnesota
University of Missouri – Columbia
University of Missouri – Rolla
University of North Dakota
University of Rochester
University of Southern California
University of Texas at Austin
University of Utah
University of Washington
Virginia Polytechnic Institute
Washington State University
Wayne State University
Wichita State University
OTHER COE AFFILIATES

ABX Air, Inc.
Adams Aircraft
AdTech Systems Research, Inc.
Advanced Composites
Advanced Transportation R&E Laboratory (ATREL)
Aero Shell
AeroClave
Aerodyne Research Inc.
Aeronic, Inc.
Aerosafe Inc.
Aerotech Engineering & Research Corp.
Air Force Research Laboratory
Air Tran Airways
Air Transport Association of America
Airborne Express
Airbus Industrie
Aircraft Owners & Pilots Association (AOPA)
Airline Pilots Association
Airports Council International – North America
Alaska Airmen’s Association
Alaska Airways
Alaska Science and Technology
Aloca Technical Center
Aldec Inc.
AlliedSignal Aerospace
AlliedSignal Engines
Allison Engine Company
Alltech Airlines
Altera Corporation
American Airlines
American Institute of Aeronautics and Astronautics
ARINC/Dayton
Armstrong Laboratory
Association of Flight Attendants
ASTM International
Atlantic Coast Airways
AVDATA
Aviation Data Service, Inc.
Aviation Management Associates
Aviation Safety Institute
Avidyne Corporation
Avionics Engineering Center
Avturf, Inc.
B/E Aerospace Inc.
Battlefield
Bell Helicopter TEXTRON
BF Goodrich R&D Center
Boeing Company
Bombardier Aerospace-Learjet
BRE Environmental Engineering
Brookhaven National Lab
California DOT
Cape Air
CC Technologies Laboratories, Inc.
Center for Disease Control and Prevention
Cessna Aircraft
Chicago O’Hare International Airport
Cirrus Aviation
Comair, Inc.
Composite Solutions
Continental Airlines
Delta Airlines
Department of Transportation
Donaldson Company, Inc.
Draper Laboratory
Eclipse Aviation
Edison Joining Technology Center
Elite Air Center
Engelhard Corporation
Engineered Arresting Systems Corporation
Executive Jet Aviation
Experimental Aircraft Assoc (EAA)
FedEx Corporation
FiberCote Industries, Inc.
First Technology Safety Systems
Fluent Incorporated
Ford
Frasca International
Frontier Technology
Galactic Scientific Corporation
Galia
General Atomics
General Aviation Manufacturers Association
Goodrich
Gulfstream Aerospace Corporation
Hamilton Sundstrand & United Technologies Research Center
HandySoft
Harris Corporation
Hartzell Propeller
Heatcon Composite Systems
Hexcel
Honeywell
Illinois Department of Aeronautics
Impact Dynamics Incorporated
Imperium, Inc.
Indiana Department of Transportation
Intec
IntramOn Corporation
International Centre for Indoor Environment & Energy, Technical University of Denmark
IntraMicro
JENTek Sensors, Inc.
Jeppeesen
Kari Deutsch
Kedag Company
KBS2, Inc.
Lancair
Leigh Fisher Associates
Livermore Software Technology Corp.
Lockheed Martin Aeronautics Company
Logical Vision Ltd.
Logistics Management Institute
Los Angeles World Airports
Lufthansa
Maryland Aviation Administration
Massachusetts Port Authority
McDonnell Douglas Aerospace
Major Incident Response
Matron Aviation, Inc.
Metropolitan Washington Airport Authority
MGA Research Corporation
ML+HDBK-17
Miltex Research & Technology (MRT)
Nantucket Airlines
NASA
National Business Aviation Association (NBAA)
National Organization to Insure a Sound-controlled Environment
NMS Bio-Defense
Northrop Grumman Corporation
Northwest Airlines
Northwest Composites
NorthWest Research Associates, Inc.
NTIAC
O’Hare Modernization Program (OMP)
O’Hare Noise Compatibility Commission
Ohio Department of Development
Ohio Department of Transportation
Orthopedic Research Institute, Inc.
Pacific Scientific
Panametrics
Paul Messon Consulting
Physical Research, Inc.
Pratt & Whitney
Professional Flight Attendants Association
Raisbeck Engineering
Rammock Corporation
Raspet Flight Research Laboratory
Raytheon Aircraft Company
Regional Airport Authority of Louisville and Jefferson County
Rockwell International
Rolls Royce
Sabre
SAE International
San Francisco Int. Airport/Community Roundtable
Sandia National Laboratories
School of Systems and Logistics
Scientific Studies Corp.
Seagull Technology
Sikorsky Aircraft
Silicon Graphics, Inc.
Simula Technologies Inc.
Sino Sweating
SMA
Sonix
Southern Air Transport
Southern California Association of Governments
Southwest Research Institute
Spaceflight Aviation Partners
SRI International
State Aviation Directors – Florida, Arizona, Alaska, Kansas, & ND
State of Illinois
Strategic Technology Enterprises
STERIS Corporation
Stoddard International
Sun Microsystems
Syport Systems Inc.
Technology Resource Group
TIMCO Aviation Services Inc.
TORAY Composites (America) Inc.
TPL, Inc.
Transport Canada
TRC, Inc.
Trigian Engineering Company
Triumph Group, Inc.
TSI Incorporated
United Airlines
United Parcel Service
US Airway
US DOT Volpe National Transportation Systems Center
US EPA National Risk Management Research Laboratory
Vector, Inc.
Virginia Department of Transportation
Weber Technology Applications
Wesson International
Winterset Development
Wyle Laboratory
UNIQUE FUNDING COMBINATIONS

• COE Research Grants require matching funds as mandated by Congress

• Cost-share contracts may follow competitive process – authorized by the White House Reinvention Lab

• Centers may receive funding from any public or private source

• Centers may contract with others as appropriate
<table>
<thead>
<tr>
<th>YEAR</th>
<th>CENTER OF EXCELLENCE</th>
<th>AMOUNT</th>
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</thead>
<tbody>
<tr>
<td>1992 to 1996</td>
<td>Computational Modeling of Aircraft Structures</td>
<td>$10 M</td>
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<tr>
<td>1995 - present</td>
<td>Airport Technology</td>
<td>$13 M</td>
</tr>
<tr>
<td>1996 - present</td>
<td>Operations Research</td>
<td>$43 M</td>
</tr>
<tr>
<td>1997 - present</td>
<td>Airworthiness Assurance</td>
<td>$125 M</td>
</tr>
<tr>
<td>2001 - present</td>
<td>General Aviation</td>
<td>$17 M</td>
</tr>
<tr>
<td>2003 - present</td>
<td>Aircraft Noise and Emissions Mitigation</td>
<td>$18 M</td>
</tr>
<tr>
<td>2004 – present</td>
<td>Advanced Materials</td>
<td>$13 M</td>
</tr>
<tr>
<td>2004 – present</td>
<td>Airliner Cabin Environment</td>
<td>$21 M</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>Grants/Contracts/Matching Funds</td>
<td><strong>$260M</strong></td>
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</tbody>
</table>
## COE Program Office Activities

<table>
<thead>
<tr>
<th>COE for:</th>
<th>Start up</th>
<th>Cooperative Agreements</th>
<th>Awards/Amndmts</th>
<th>Evals</th>
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</thead>
<tbody>
<tr>
<td>Computational Modeling</td>
<td>1992</td>
<td>2</td>
<td>48</td>
<td>1995</td>
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<tr>
<td>Airworthiness Assurance</td>
<td>1997</td>
<td>38</td>
<td>325</td>
<td>2000</td>
</tr>
<tr>
<td>General Aviation</td>
<td>2001</td>
<td>10</td>
<td>115</td>
<td>2002, 2004</td>
</tr>
<tr>
<td>Noise &amp; Emissions</td>
<td>2003</td>
<td>9</td>
<td>90</td>
<td>2006</td>
</tr>
<tr>
<td>Adv’d Materials</td>
<td>2003</td>
<td>10</td>
<td>47</td>
<td>2006</td>
</tr>
<tr>
<td>Cabin Environment</td>
<td>2004</td>
<td>10</td>
<td>25</td>
<td>2007</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>8</strong></td>
<td><strong>90</strong></td>
<td><strong>800</strong></td>
<td><strong>12</strong></td>
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</tbody>
</table>
## RESULTS

<table>
<thead>
<tr>
<th>COE Partnerships Established</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Partners and Affiliates</td>
<td>&gt; 260</td>
</tr>
<tr>
<td>Collaborations (NASA, Transport Canada, Sandia, Iceland, DoD, Volpe, etc.)</td>
<td>&gt; 6</td>
</tr>
<tr>
<td>Projects Supported</td>
<td>&gt; 500</td>
</tr>
<tr>
<td>Graduate Students Supported</td>
<td>&gt; 900</td>
</tr>
<tr>
<td>Published Articles, Reports, Doctoral Theses</td>
<td>&gt; 2,000</td>
</tr>
<tr>
<td>Matching Funds</td>
<td>&lt; $ 100 M</td>
</tr>
</tbody>
</table>

*Level of Effort (Grants/Contracts/Matching Funds) $ 260 M*
STREAMLINED ADMINISTRATION

- Projects are funded on an on-going basis following proposal submission and technical evaluations by sponsoring organization(s).

- Technical reviews are conducted quarterly during first year, semi-annually thereafter.

- COE management, projects, and progress are reassessed every three years; matching funds are audited.

- COE members attend an annual joint meeting hosted by industry affiliates to enhance partnership opportunities.
COE Annual Joint Meetings

- Students are provided an opportunity to highlight their work and engage in technical discussions with leaders in the field.

- Senior scientists have a forum for disseminating research results, coordinating efforts, and fielding research ideas among peers.

- Government, COE industry affiliates, and university members have an opportunity for discourse to enhance / expand partnership opportunities, generate matching funds, and review research direction and progress.
1st Annual Joint Meeting

GENERAL ELECTRIC CO & OHIO STATE UNIVERSITY

Location: GE Aircraft Engines, Cincinnati, Ohio
Dates: November 13 - 16, 2001

Theme: *Bridging the Gap* - between government, academia, and industry

Hosts: General Electric Aircraft Engines and Ohio State University

**Student Dinner and Poster Contest** hosted and judged by GE senior management team
2nd Annual Joint Meeting

AIRCRAFT MANUFACTURERS & WICHITA STATE UNIVERSITY

Location: Wichita, Kansas
Dates: October 21 - 24, 2002

Theme: Partners Working Together for Excellence in Aviation

Special Guests: US Transportation Secretary Norman Y. Mineta
US Congressman Todd Tiahrt

Hosts: Boeing, Cessna, Raytheon, & Bombardier-Learjet
Wichita State University

Student Awards:

• Student Dinner and Poster Contest Awards provided and presented by local aircraft manufacturers

• DOT COE Outstanding Student of the Year recognized
3rd Annual Joint Meeting

AVIATION INDUSTRY & ERAU

Location: Daytona Beach, Florida
Dates: November 4 - 7, 2003

Theme: FAA COEs - The Next Five Years

Hosts: Boeing, Harris Corporation, Atlantic Southeast Airlines, Aviation Management Associates, Galaxy Scientific Corp., Sensis Corporation, Jeppesen, Embry-Riddle Aeronautical University

Keynote Speaker: Ambassador Edward Stimpson, ICAO

Student Awards:
- Poster Contest and JPDO Futures Paper Competition awards provided and presented by COE industry affiliates
- DOT FAA COE Outstanding Student of the Year Award recognized
4th Annual Joint Meeting

COE INDUSTRY AFFILIATES & UNIVERSITY OF CENTRAL FLORIDA

Location: Melbourne and Orlando, Florida
Dates: March 14 - 16, 2005

Theme: Global Leadership – Commitment to Worldwide Improvement

Hosts: Harris Corporation, the Boeing Company, Cessna Aircraft Company, Pratt & Whitney, Lockheed-Martin, Raytheon, Tandberg Inc., General Electric, Gulfstream Aerospace Corporation, Galaxy Scientific Corporation, Engine Titanium Consortium (ETC), Aviation Management Associates, Center for Advanced Transportation Systems Simulation (CATSS), and University of Central Florida

Keynote Speaker: Ambassador Thomas Pickering, VP Boeing Company
Dinner Speaker: The Honorable John Goglia, NTSB (retired)

Special Awards:
• Student Poster Contest
• DOT FAA COE Outstanding Student of the Year
• Joseph A. Hartman Boise State University-COE Industry Leadership Award
COE BENEFITS

- **Promotes** academic, government & industry scientific networks prepared to enhance the safety, security & efficiency of the national airspace system

- **Augments** government resources & leverages funds through flexible and responsive partnerships

- **Expands** the U.S. math & science pipeline and facilitates recruitment opportunities

- **Provides** a formal strategy & recognized structure to coordinate a national research agenda and related education, and training

- **Advances** U.S. technology and expertise and satisfies Congressional mandate

*The nation must immediately reverse the decline in and promote the growth of a scientifically and technologically trained U.S. aerospace workforce”*

Final Report of the Commission on the Future of the United States Aerospace Industry
FAA CENTERS OF EXCELLENCE

For more information, contact:

Patricia Watts, Ph.D.
National Program Director
Air Transportation Centers of Excellence

FAA William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405
Telephone (609) 485-5043
Fax: (609) 485-9430

Email: patricia.watts@faa.gov

Website: www.coe.faa.gov
FAA Established Centers

COE for Airliner Cabin Environment Research
Joint COE for Advanced Materials
FAA/NASA COE for Aircraft Noise & Aviation Emissions Mitigation
COE for General Aviation
COE for Airworthiness Assurance
COE for Operations Research
COE for Airport Technology

Joint Center for Computational Modeling of Aircraft Structures
(designated by Congress 1992 – 1996)
COE for Airliner Cabin Environment Research (ACER)

- Selected by the Administrator – August 2004
- Technology Areas:
  - Development of Cabin Air Quality Sensors and Sensor Systems to Monitor Cabin Air Environment and Detect Potential Environment Contaminants
  - Investigation of the Health Effects of Potential Contaminants and Other Aspects of Airliner Cabin Environments
  - Field and Laboratory Analysis of Potential Cabin Contaminants
  - Development of Databases, with Supporting Architecture, for Documentation of Contaminants and Contaminant Incidents on Commercial Airliners

Sponsor: FAA Office of Aerospace Medicine
Members: Auburn University, Harvard University, Purdue University, Boise State University, Kansas State University, University of California at Berkeley, University of Medicine and Dentistry of New Jersey, Oklahoma State University, St. Louis University

Technical Co-Leads: Harvard University and Purdue University
Administrative Lead: Auburn University
William F. Gale, Ph.D.
e-mail Address: wfgale@eng.auburn.edu
COE for Airliner Cabin Environment
Research Affiliates

AeroClave
AIG Aviation
Airline Pilots Association
Aldec
Altera
Association of Flight Attendants
Battelle
The Boeing Company
Delta Airlines
Donaldson
Engelhard
Fluent
GE Aircraft Engines
General Atomics
Goodrich Sensor Systems

Honeywell
Hamilton Sundst./UTRC
Int. Cent. Indoor Environ. & Energy
Intergraph
IntraMicron
Keddeg Company
Major Incident Response
NMS Biodefense
Professional Flight Attendants Association
Spitfire Aviation Partners
STE – STERIS Corporation
TSI, Inc.
Joint COE for Advanced Materials (JAMS)

- Announced by the Secretary of Transportation – December 2003
- Technology Areas:
  - Safety and Certification Initiatives of Composites and Advanced Materials on Large Transport Commercial Aircraft
  - Safe and Reliable Use of Advanced Materials in Aircraft Workforce Training
  - Relationships Between Design, Manufacturing, Operations, and Maintenance

Sponsor: FAA Airport & Aircraft Safety R&D Division
Members: University of Washington, Wichita State University, Edmonds Community College, Northwestern University, Purdue University, Oregon State University, Tuskegee University, UCLA, University of Delaware, Washington State University

University Leads: Wichita State University and the University of Washington
E-mail Addresses: John Tomblin, Ph.D., john.tomblin@wichita.edu
Mark Tuttle, Ph.D., tuttle@u.washington.edu
Joint COE for Advanced Materials Affiliates

Composites and Advanced Materials Team
Industry Affiliates
WICHITA STATE UNIVERSITY

Adam Aircraft
Advanced Composites
Airbus
Air Force Research Laboratories
ASTM International
Boeing
Bombardier
Cessna, a Textron Company
CIRRUS Design
Ford
MIL-HDBK-17
NASA
Raytheon
SAE International
TORAY
Triumph Composite Systems, Inc.

Advanced Materials in Transport Aircraft Structures Team
Industry Affiliates
UNIVERSITY OF WASHINGTON

The Boeing Company
Composite Solutions
Cytec Engineering Materials
HEATCON Composite Systems
Hexcel Corporation
Integrated Technologies (Intec), Inc.
Northwest Composites, Inc.
Stoddard International, LLC
TORAY Composites (America), Inc.
Triumph Group, Inc.
Announced by the Administrator – August 2003
Single Source Contract Authority: $6M cap
Technology Areas:
- Socio-economic Effects of Noise and Emissions Impacts
- Noise Abatement Flight Procedures
- Compatible Land Use Management
- Airport Operational Controls
- Noise and Emissions Measurements and Health

Sponsors: Office of Environment & Energy in partnership with NASA and Transport Canada
Members: Massachusetts Institute of Technology, Boise State University, Florida International University, Pennsylvania State University, Purdue University, Stanford University, University of Central Florida, University of Missouri-Rolla, Georgia Institute of Technology, York University

University Lead: MIT
Ian Waitz, Ph.D.
e-mail Address: iaw@mit.edu
<table>
<thead>
<tr>
<th>COE for Aircraft Noise &amp; Aviation Emissions Mitigation Affiliates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerodyne Research, Inc.</td>
</tr>
<tr>
<td>Airbus</td>
</tr>
<tr>
<td>Air Transport Association of America</td>
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<tr>
<td>Airports Council International - North America</td>
</tr>
<tr>
<td>American Institute of Aeronautics and Astronautics</td>
</tr>
<tr>
<td>Bell Helicopter Textron, Inc.</td>
</tr>
<tr>
<td>Boeing Commercial Airplanes Group</td>
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<tr>
<td>Delta Air Lines, Inc.</td>
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<tr>
<td>General Electric Aircraft Engines</td>
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<tr>
<td>Gulfstream Aerospace Corporation</td>
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<tr>
<td>Indiana Department of Transportation</td>
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<tr>
<td>Lockheed Martin Aeronautics Company</td>
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<tr>
<td>Logistics Management Institute</td>
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<tr>
<td>Massachusetts Port Authority</td>
</tr>
<tr>
<td>Metron Aviation, Inc.</td>
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<td>Metropolitan Washington Airports Authority</td>
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<td>National Organization to Insure a Sound-controlled Environment (N.O.I.S.E.)</td>
</tr>
<tr>
<td>O’Hare Noise Compatibility Commission</td>
</tr>
<tr>
<td>Palisades Citizens Association</td>
</tr>
<tr>
<td>Pratt &amp; Whitney</td>
</tr>
<tr>
<td>Raisbeck Engineering</td>
</tr>
<tr>
<td>Rannoch Corporation</td>
</tr>
<tr>
<td>Regional Airport Authority of Louisville and Jefferson County</td>
</tr>
<tr>
<td>Rolls-Royce, plc</td>
</tr>
<tr>
<td>San Francisco International Airport/Community Roundtable</td>
</tr>
<tr>
<td>Sikorsky Aircraft Corporation</td>
</tr>
<tr>
<td>United Parcel Service Airline</td>
</tr>
<tr>
<td>United Technologies Pratt &amp; Whitney</td>
</tr>
<tr>
<td>Wyle Laboratories</td>
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</tbody>
</table>
COE for General Aviation (CGAR)

- Competitively Selected: 2001
- Single source contract authority: $20M cap
- Technology Areas:
  - Aging Aircraft
  - Crashworthiness
  - Propulsion
  - Icing
  - Advanced Materials

Sponsor: FAA Airport & Aircraft Safety R&D Division
Members: Embry-Riddle Aeronautical University, Florida A&M University, University of Alaska, University of North Dakota, Wichita State University

University Lead: Embry-Riddle Aeronautical University
Steven Hampton, Ed.D.
E-mail Address: hamptons@db.erau.edu
## COE for General Aviation Affiliates

### Industry Affiliates

- Aero Shell
- Aircraft Welding Works
- Alaska Airmen’s Association
- Alaska Aviation Safety Foundation
- Aviation Management Associates
- Avidyne Corporation
- Bombardier Aerospace
- Cessna Aircraft Corporation
- Cirrus Aviation
- Eclipse Aviation
- Elite Air Shares
- Frasca International
- Goodrich Corporation
- HandySoft Corporation

### Advisory Group Members

- Aircraft Owners and Pilots Association (AOPA)
- Experimental Aircraft Association (EAA)
- General Aviation Manufacturers Association (GAMA)
- National Business Aviation Association (NBAA)
- State Aviation Directors – Florida, Arizona, Alaska, Kansas, and North Dakota

- Hartzell Propeller, Inc.
- Jeppesen
- Lancair
- Lockheed Martin
- Raytheon Aircraft Company
- Sun Microsystems
- SMA
- The Alaska Science & Technology
- The Boeing Company
- Vector Training Systems
COE for Airworthiness Assurance (AACE)

- Competitively Selected: 1997
- Single source contract authority: $100M cap
- Technology Areas:
  - Maintenance, Inspection, and Repair
  - Crashworthiness
  - Propulsion and Fuel Systems Safety Technologies
  - Advanced Materials

Sponsor: FAA Airport & Aircraft Safety R&D Division
Members: Phase II – 31 Equal University Partners (see following list)
COE for Airworthiness Assurance
Phase II - University Members

Arizona State University
Baylor University
Carnegie Mellon University
Embry-Riddle Aeronautical University
Florida International University
George Washington University
Iowa State University
Johns Hopkins University
Lehigh University
Mississippi State University
New Jersey Institute of Technology
North Carolina A&T State University
Northwestern University
Ohio State University
Ohio University
Pennsylvania State University

Purdue University
Rutgers University
Tuskegee University
University of Arizona
University of California at Berkeley
University of California at Los Angeles
University of California at Santa Barbara
University of Dayton
University of Maryland
University of Missouri - Columbia
University of North Dakota
University of Utah
University of Washington
Wayne State University
Wichita State University
COE for Airworthiness Assurance
Phase II – Industry Affiliates

ABX Air, Inc.
AirTran Airways
Alaska Airlines
Aloha Airlines
American Airlines
American Eagle
Atlantic Coast Airways
Boeing
Bombardier Aerospace-
Learjet
Cape Air
Cessna
Continental

Delta
Federal Express
General Electric
Honeywell
JetBlue Airways
Lufthansa
Nantucket Airlines
Northwest
Pratt & Whitney
Raytheon
United Airlines
US Airways
COE for Operations Research (NEXTOR)

- Competitively Selected: 1996
- Single source contract authority: $10M - Phase I, $40M - Phase II
- Technology Areas:
  - Air traffic Management and Control
  - Human Factors
  - System Performance and Assessment Measures
  - Safety Data Analysis
  - Communications, Data Collection and Distribution
  - Aviation Economics

Sponsor: FAA Technology Development & Operations Research
Members: University of California at Berkeley, Massachusetts Institute of Technology, Virginia Polytechnic Institute, University of Maryland, George Mason University

University Contact: Scott Simcox,
NEXTOR Business Manager
e-mail Address: simcox@uclink.berkeley.edu
University Partners
Air Force Institute of Technology
Rensselaer
San Jose State University
University of Michigan
University of Minnesota
University of Rochester
University of Southern California
University of Texas at Austin

Industrial Affiliates
The Boeing Company
California Department of Transportation
Draper Laboratory
Federal Express
Honeywell
Leigh Fisher Associates
Logistics Management Institute
Maryland Aviation Administration
Los Angeles World Airports
Massachusetts Port Authority
Metron Aviation, Inc.
Northrop Grumman

Sabre
San Francisco International Airport
Seagull Technology
Southern California Association of Governments
Virginia Department of Transportation
COE for Airport Technology (CEAT)

• Competitively Selected: 1995 (as the Center of Excellence for Airport Pavement Technology R&D)

• Technology Areas:
  – High Performance Concrete
  – Non-destructive Evaluation of Pavements
  – Stabilized Base Material
  – Structural Behavior and Modeling
  – Airport Pavement Design Concepts/Procedures
  – Wildlife Research

Sponsor: FAA Airport & Aircraft Safety R&D Division
Members: University of Illinois, Northwestern University, Embry-Riddle Aeronautical University (Prescott), North Carolina A&T, Rensselaer Polytechnic Institute

University Lead: University of Illinois at Urbana-Champaign
(Located at the former Chanute Air Force Base, Rantoul, ILL)
Professor David A. Lange
e-mail Address: dlange@uiuc.edu
COE for Airport Technology University Members

**CENTER PARTNERS**
University of Illinois at Urbana Champaign
Embry-Riddle Aeronautical University (Prescott)
Rensselaer Polytechnic Institute

**INDUSTRY PARTNERS**
AvTurf, Inc
The Boeing Company
O’Hare Modernization Program (OMP)
Trigon Engineering Company

**PUBLIC PARTNERS**
City of Chicago
State of Illinois
Joint Center for Computational Modeling of Aircraft Structures

• First FAA Center of Excellence, Designated by Congress: 1990
• Operational: 1992 to 1996
• Technology areas funded through matching grants:
  – Widespread Fatigue-Damage
  – Residual-Life and Residual-Strength Estimations
  – Mechanical and Composite-Patch Repairs
  – Life-Enhancement Methodologies
  – Discrete Source Damage

Members Designated by Congress: Rutgers University and Georgia Institute of Technology
ROLE OF INDUSTRY PARTNERS

• May serve on COE Industry Advisory Board or Steering Committee
• Provide matching funds, cash or in-kind in accordance with OMB direction
  – Labor
  – Materials
  – Lab space
  – Host meetings
  – Other
The FAA ensures geographic equity, and considers minority and special groups.

Each Center of Excellence matches government grant funds from non-federal sources in accordance with OMB Circulars; and interprets, publishes, and disseminates research results.

Establish close working relationships across organizational lines.

Strategically focus aviation research efforts through long-term partnerships for 3 to 10 years.

Coordinate a national research agenda, avoid duplication of effort; augment internal resources, leverage scarce funds.