

FAA University Design Competition for Airports

*Presentation to
National Council of Space Grant Directors
March 16, 2006*

Mary Sandy

FAA Competition Goals

- *Raise awareness of the importance of airports to the National Airspace System infrastructure.*
- *Increase the involvement of the academic community in addressing airport operations and infrastructure issues and needs.*
- *Engage U.S. students in the conceptualization of applications, systems and equipment capable of addressing related challenges in a robust, reliable and comprehensive manner.*
- *Encourage U.S. undergraduate and graduate students to contribute innovative ideas and solutions to airport and runway safety issues.*
- *Provide the framework and incentives for quality educational experiences for university students.*
- *Develop an awareness of and an interest in airports as a vital and interesting area for engineering and technology careers.*

FAA Competition Partners

- *The American Association of Airport Executives* is sponsoring the award ceremony and providing a forum for winner presentations as well as for advice, expert links for teams, assistance in dissemination of the competition opportunity to its members, and participation in design reviews.
- *The Airport Consultants Council* is providing advice, expert links for teams, assistance in dissemination of the competition opportunity to its members and participation in design reviews.
- *The Airports Council International* is providing advice, expert links for teams, assistance in dissemination of the competition opportunity to its members and participation in design reviews.
- *The National Association of State Aviation Officials* is providing advice, expert links for teams, assistance in dissemination of the competition opportunity to its members, and participation in design reviews.

National Space Grant Network

- **Asked to disseminate electronic flyers on the program to all appropriate university contacts in your state.**
- **Asked to encourage faculty at Space Grant institutions to engage their students in the competition.**
- **Consider possible multidisciplinary, multi-departmental or multi institutional teams.**
 - **Good vehicle for collaboration among institutions**
 - **A worthwhile aeronautics project**
 - **Allows for interdisciplinary approach and solutions**

Faculty Focus Group

- **Joe Rule, Professor and Associate Dean, College of Science, Old Dominion University**
- **Bill Mason, Professor, Mechanical Engineering, Virginia Tech**
- **Jim McDaniel, Professor, Aerospace Engineering, University of Virginia**
- **Steve Landry, Assistant Professor, Industrial Engineering, Purdue University**
- **Mike Myers, Professor, Civil Engineering, Georgia Tech**

Reviewed Guidelines to ensure viability for undergraduates in engineering and science disciplines.

FAA Competition Design Challenge Categories

- **Airport Operation and Maintenance**
- **Runway Safety/Runway Incursions**
- **Airport Environmental Interactions**

Airport Operation and Maintenance Challenges

Exploring new methods for design and maintenance of pavement surfaces. Ideas include but are not limited to:

- Methods for innovative pavement repair.**
- Innovative pavement materials, installation and maintenance techniques, including non-destructive evaluation methodologies.**
- Improved approaches to rubber removal/surface restoration due to aircraft tire friction.**
- New or improved techniques for ice removal from runways.**
- Improved methods for foreign object detection and removal from runway surfaces.**

Runway Safety/Runway Incursion Design Challenges

- A. Expanding situational awareness of pilots and ground operators on the airfield. Ideas include, but are not limited to:**
- **Direct warning systems to alert pilots that they are approaching a runway and if the runway is occupied.**
 - **Development of innovative techniques to record, analyze and display annotated spatial data for improved situational awareness of ground operations.**
- B. Enhancing Airport Visual Aids**
- **Improved lighting, marking, and signage for runways, taxiways and the airport apron.**
 - **Lighting other than traditional incandescent.**
 - **Providing surface navigation guidance to pilots in the cockpit via electronic alternatives in limited visibility conditions (in lieu of outside visual cues).**

Airport Environmental Interactions Design Challenges

- A. Making snow and ice removal more environmentally friendly. Both chemical and non-chemical options can be considered. The FAA is seeking designs that offer:**
- Improved means and methods of complying with aircraft and airfield anti- and de-icing requirements.**
 - Environmentally safe aircraft and airfield de-icing/anti-icing products that are compatible with both aircraft structures and airport pavements.**
 - Improved containment and cleanup of de-icing products.**

Airport Environmental Interactions Design Challenges

- B. Improving methods for containment and cleanup of fuel spills.**
 - **Bioremediation techniques for fuel spill cleanup.**
 - **Techniques/substances for neutralization of toxic components of fuel.**
 - **Techniques/substances that delay the biological and chemical breakdown of fuel, allowing cleanup to occur without causing rapid decreases in dissolved oxygen in receiving waters that result from biological and chemical degrading of the fuel.**
 - **Techniques for prevention of percolation of fuel into ground water.**

Airport Environmental Interactions

Design Challenges

- C. Increasing energy efficiency in the management of airfields. (This challenge specifically excludes consideration of terminal and other airport buildings.) Topics that might be considered include:**
- Alternative energy/energy efficient airport equipment such as tow vehicles, emergency generators, power units, heating systems, etc. for use in airfield areas.**
 - Alternate energy sources and approaches to providing lighting at remote airports that don't have access to electrical power.**

Awards

A cash award will be given to the student or student team members in each category as follows:

- **Airport Operations and Maintenance Design Award: First place - \$2,500; Second Place - \$1,500, Third Place - \$1,000.**
- **Runway Safety/Runway Incursions Design Award: First place - \$2,500; Second Place - \$1,500, Third Place - \$1,000.**
- **Environmental Interactions Design Award: First place - \$2,500; Second Place - \$1,500, Third Place - \$1,000.**

Team representatives for first place awards will be invited to accept their award and present their design at the American Association of Airport Executives Annual Conference and Exposition, June 10 – 13, 2007 in Washington, DC.

A travel allowance of up to \$2,000 per award will be provided for two individuals (two students or one faculty advisor and one student) from each award winning team.

FAA University Design Competition for Airports

Key Dates

- **Competition Announcement – April 2006**
- **Notice of Intent required and anticipated prior to start of design process. Summer semester deadline is June 15, 2006. Fall semester deadline is September 18, 2006. Spring semester deadline is January 29, 2007.**
- **Design submittal deadline is 5 p.m. Eastern Daylight Time, April 20, 2007.**
- **Winners will be announced by May 15, 2007.**
- **Award Ceremony and Presentations – June 10 – 13, 2007. Exact date(s) within this time frame to be determined.**
- **Competition web site will be available at time of announcement:**
[http://www.faa.gov/runwaysafety/Design Competition.](http://www.faa.gov/runwaysafety/Design%20Competition)