SpaceTEC® Talk

National Aerospace Technical Education Center

SPRING 2006

SpaceTEC® Member Institutions

Allan Hancock College
(California)

Antelope Valley College
(California)

Brevard Community College
(Florida)

Calhoun Community College
(Alabama)

Community College of the Air Force
(Alabama)

Cuyahoga Community College
(Ohio)

Doña Ana Branch Community College
(New Mexico)

Embry Riddle Aeronautical University
(Florida and Arizona)

Edmonds Community College
(Washington)

Palm Beach Community College
(Florida)

Pearl River Community College
(Mississippi)

Prince George's Community College
(Maryland)

San Jacinto College
(Texas)

Thomas Nelson Community College
(Virginia)

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A Message from the PI . . .

Someone once said that ***the only thing that doesn't change is change itself,*** and we are living proof of that! As we experience our fourth year as an NSF National Center, I am proud of how many goals we have met even in the midst of unprecedented changes in aerospace.

Consider for a moment what has happened in the world since we started down the road toward creating a National Aero**space** **T**echnical **E**ducation **C**enter:

- ✓ On September 11, 2001, terrorist assaults closed access to the nation's aerospace facilities.
- ✓ On February 1, 2003, Shuttle Columbia broke up over Texas, killing all seven of its crew.
- ✓ On March 19, 2003, the war in Iraq began, making access to space even more important.
- ✓ On January 14, 2004, President Bush announced his new Space Exploration Initiative.
- ✓ On April 14, 2004, Michael Griffin became the 14th NASA Administrator.
- ✓ On June 21, 2004, Mike Melville became the first private pilot to fly to sub-orbital space.
- ✓ On October 4, 2004, Brian Binnie piloted SpaceShipOne to win the $10M Ansari X-Prize.
- ✓ On July 26, 2005, Space Shuttle Discovery successfully returned Americans to space.
- ✓ On August 10, 2005, Virgin Galactic received approval to fly the paying public to space, and more than 30,000 people have made a down payment on the $200,000 tickets for sub-orbital flights.
- ✓ NASA's Crew Exploration Vehicle and Commercial Orbital Transportation Services are out for bid.

These amazing events have several important factors in common. They changed our world forever; they impacted aerospace very significantly; and they made it very clear that what we do is not about us, it's about making the nation as strong as possible in aerospace. As we said from the very beginning, **we are part of the solution, not part of the problem.** To that end, we continue to grow and expand, thanks to our partner colleges and major stakeholders.

- ✓ On July 26, 2002, SpaceTEC hosted its first meeting as an NSF National Center of Excellence.
- ✓ On October 27, 2004, the FAA and SpaceTEC signed an MOU to partner for education.
- ✓ On December 10, 2004, SpaceTEC core-certified its first two aerospace technicians.
- ✓ On August 1, 2005, the National Science Foundation funded SpaceTEC's renewal grant.
- ✓ On March 1, 2006, we concluded the baseline certification process, with

continued on page 2

A Message from the PI, continued

nearly 295 core certification exams administered in five states. A total of 79 technicians have been certified, to date.

- ✓ Work is nearing completion on our first two concentrations, in aerospace manufacturing and vehicle processing, and testing should begin within the next quarter on those certifications.
- ✓ We have hosted our first formal paper sessions at the ATEA national conference in Louisville, Kentucky, paving the way for technician professional development in the future.
- ✓ We have revised our national infrastructure, naming new internal and external evaluators, reorganizing the National Visiting Committee, and adding new members to our NATAC.
- ✓ Doña Ana Branch Community College, Las Cruces, NM, has just become our 14th partner college.
- ✓ Calhoun Community College, Decatur, Ala., will host our SpaceTEC annual review on April 17-20, 2006.

At the end of the day, each of us must evaluate what we have done and whether it has meaning in the broader scheme of things. Because of the road we have traveled and the challenges we have met, **SpaceTEC has matured and is more ready than ever to support our aerospace partners**, assessing technical competence, implementing national skills standards, and providing the professional development required to make our aerospace workforce the best in the world.

This issue of ***SpaceTEC Talk*** highlights our current achievements in many areas, and I invite your comments. **The foundation is behind us, and the real opportunities lie ahead. I can hardly wait for what's next!**

Al Koller

Certification Update

SpaceTEC® Certified Aerospace Technician Core Examination Declared Operational

Effective March 1, 2006, the SpaceTEC® Certified Aerospace Technician Core Examination was declared operational with the baseline process formally closed. During the baseline testing period, a total of 295 written and 92 oral and practical exams were administered resulting in 79 individuals earning the Certified Aerospace Technician credential. Baseline testing was conducted in five states at eight different locations including Vandenberg Air Force Base and Kennedy Space Center.

Feedback received from the baseline testing was used to upgrade the examination including the knowledge, oral and practical sections. RWD has posted version 1.2 and the core exam is available for immediate use. Improvements have also been made to the SpaceTEC® Examiner (STE) Oral and Practical manuals and the updated manuals will be distributed to all STE's. In addition to reposting the exam and revisions to the STE manual, the core Readiness Course has also been updated and will be distributed to SpaceTEC partners.

Progress continues on the manufacturing concentration currently under development at Calhoun Community College and the vehicle processing concentration at Brevard Community College. Concentration exam questions have been drafted and are undergoing an industry review. Baselines for the manufacturing and vehicle processing concentrations are scheduled for mid-2006.

Teledyne Brown-Huntsville Employees Complete Certification Requirements

David Allen Barnett and Kenneth L. Miller from Teledyne Brown Engineering (TBE) in Huntsville, Alabama, were recently recognized by their supervisor, Rickey Mason, and Jim Swindell, Asst. Dean of Technology at Calhoun Community College, along with other TBE employees for completing the SpaceTEC Aerospace Core Certification. Both are industry incumbents who completed written, oral, and performance evaluations at Calhoun. Other recent Core Certified Technicians are Steve Dickerson, Calhoun graduate and employee at Med Therm, and Dave Johnson, an employee at Summa Technology.

Pictured are Jim Swindell, Calhoun Community College, Kenneth Miller, David Barnett, and Rickey Mason (supervisor) from Teledyne Brown Engineering.

Thomas Nelson Hosts Recognition Luncheon

A recognition luncheon to honor three NASA Langley technicians and launch Thomas Nelson Community College's (TNCC) two new SpaceTEC degree programs was held in December at TNCC. The catered luncheon was attended by college administrators and faculty and NASA Langley branch and department heads.

Luke Catella, James High and Ralph Stephens were recognized as the first technicians at NASA Langley to receive SpaceTEC's national certification for aerospace technicians. Luke, formerly of the Aerospace Composite Models Development Branch, recently located to Kennedy Space Center in Florida. James and Ralph are both technicians in the Technology Development and Integration Branch at NASA Langley.

Dr. Charles A. Taylor, President of Thomas Nelson Community College, presented the certificates and congratulated the recipients on their outstanding achievement. Stewart Harris, Associate Director for Fabrications, shared NASA Langley's new and exciting vision to retool and apply the center's expertise in aeronautics towards the upcoming mission to Mars. He thanked the college for developing the new associate degree programs that support this new initiative.

Pat Taylor, SpaceTEC Co-PI and Dean of Mathematics, Engineering and Technologies, gave an overview of the SpaceTEC program, including the two new degree programs in engineering technology and materials science. The engineering technology associate degree was developed as a result of discussion with NASA Langley representatives in 2003 to design a curriculum for the technician of the future. It includes a broad range of courses in electronics, mechanical engineering technology, composite materials, laser and fiber optics, robotics and computer aided drafting and design.

Pat also described the opportunities for graduates and the incumbent workforce in certification testing as aerospace technicians. Thomas Nelson's two SpaceTEC evaluators, Nancy Holloway and Rudy Schwab, were acknowledged for their service to the program.

Pictured from left to right: Mr. Stewart Harris, Associate Director for Fabrication, NASA Langley Research Center; James High, NASA Langley Certified SpaceTEC Aerospace Technician; Ralph Stephens, NASA Langley Certified SpaceTEC Aerospace Technician; Dr. Charles A. Taylor, president, Thomas Nelson Community College; and Pat Taylor, TNCC Dean of Mathematics, Engineering and Technologies

Brevard Hosts Technician Appreciation Night

Brevard Community College, in conjunction with SpaceTEC, hosted the Third Annual Aerospace Technician Appreciation Night on November 16, 2005, to honor and thank the aerospace technicians who work at Kennedy Space Center and Cape Canaveral Air Force Station. The event was a hugely successful evening and was enjoyed by over 250 technicians and other participants, which included SpaceTEC Co-PIs who were in Florida for a conference.

James Kennedy, Kennedy Space Center Director; Col. Greg Billman, Vice Commander of the 45th Space Wing; and Patti Grace Smith, Associate Administrator for Commercial Space Transportation, Federal Aviation Administration, each spoke briefly, thanking the technicians for the significant contributions they make to the aerospace industry. Adrian Laffitte, Director of Lockheed Martin Space Systems, served as Master of Ceremonies.

San Jacinto Prepares for Summer Exploration Program

The Aerospace Academy for Engineering and Teacher Education at San Jacinto College is bringing the heat, as staff prepare for the upcoming Summer Space Sciences Exploration Program on July 17-20, 2006. The program is targeted to rising junior and senior high school students who are interested in the sciences. The overall goal of this project is to use the technologically rich and exciting resource represented by the aerospace industry at NASA's Johnson Space Center to inspire students to an interest in high technology and aerospace fields and to provide them with the necessary foundational skills and knowledge for success in those fields.

Students will be able to participate in activities and workshops dealing with robotics, rocketry, astromaterials, aerospace careers, and geographic information systems (GIS), on-site NASA tours (including a tour of the Neutral Buoyancy Laboratory), and job shadowing activities.

According to project coordinator Andrea Kinsaul, "I'm excited that these students will have such a great opportunity to explore the possibilities of a job in aerospace technology. I know they will learn a lot and have fun doing it!"

The workshop will be held at Space Center Houston, the official visitors' center of NASA's Johnson Space Center, and on-site at NASA's Johnson Space Center. This summer opportunity is an excellent example of how the Aerospace Academy at San Jacinto College and SpaceTEC are working together to leverage efforts to interest the students of today in the future of space.

Pearl River Community College Aviation Maintenance Technology Program Takes Off

Careers can now take off in Pearl River Community College's new Aviation Maintenance Technology program which began in fall 2005. The program, approved by the Federal Aviation Administration, provides students with the necessary training to become certified aircraft mechanics.

The new PRCC Aviation Maintenance Program is good for business, according to Programs Manager Jerry Hemphill of The Hancock County Port and Harbor Commission, which serves as the economic development agency in Hancock county and operates the Stennis International Airport, the Port Bienville Industrial Park, the Industrial Air Park, and the Port Bienville Shortline Railroad.

"The Aviation Maintenance program is a drawing card for the businesses that will create jobs," said Hemphill. "Airports need people who are trained and qualified to work on airplanes, so we can tell businesses looking at our location that we have a qualified workforce on site."

PRCC's Aviation Maintenance Technology Program consists of two areas of study: Power Plant Maintenance and Airframe Maintenance. The Aviation Power Plant Maintenance coursework focuses on aircraft engine components and the maintenance, repair and inspection of aircraft engines. Airframe Maintenance classes emphasize the structural integrity of aircraft. The curriculum provides for hands-on experience performing a variety of repairs and alterations to sheet metal and composite aircraft structures.

Upon completion of the program, students are qualified to take the Federal Aviation Administration examination for certification as an Aircraft Maintenance Technician. Aviation Maintenance Technology graduates will earn a certificate of proficiency or an optional Associate of Applied Science degree.

Instructor Ken Lancaster with the new Cessna 310 that is used for hands-on training

Titan 1 Undressing

The Titan 1 rocket, which was donated to SpaceTEC by the "Save the Rocket Foundation", is undergoing a final undressing. The rocket will be used as a training aid for Brevard Community College students and is presently stored at the rear of the SpaceTEC building.

Two individuals from Wright Patterson Air Force Base are presently involved in an effort to remove the mildly radioactive Thorium from the slipstream portions of the rocket. Each of the rivets needed to be cut or ground off and then punched through the skin. It is estimated that a thousand rivets will be removed during this process.

Calhoun's High Tech Symposium "Connects" with Students

The Calhoun Community College High Tech Symposium series has been helping students in the college's service area make the connection between school and work for the past five years. Some of the most successful events of the program have been those centering on Aerospace and Advanced Electronics Manufacturing.

The High Tech Symposium series invites junior and senior career/technical students from schools within the Calhoun Advanced Technologies Tech Prep Consortium to participate in a series of one-day seminars throughout the school year. Each seminar focuses on issues involving the importance of technology in the industrial sector and the role of Career/Technical Education in preparing students to enter the workforce. Plant tours, opportunities to meet with both plant managers and employees on the plant floor and a luncheon with plant personnel are all part of the program.

This year, Calhoun's High Tech Symposium event in December 2005, featuring Aerospace and Advanced Electronics Manufacturing, visited both Wildwood Electronics and The Boeing Huntsville facility. The Wildwood segment of the event included a presentation on the company's growth, a facilities tour and lunch with Wildwood management and employees. At Boeing, students also had the opportunity to meet and talk with many Boeing employees, to see a presentation on the facility's growth and tour the PAC-3 manufacturing area. Wildwood is a supplier of electrical assemblies to Boeing.

In prior years, High Tech Symposium visits in the aerospace industry have included the Boeing Delta facility in Decatur, NASA's Marshall Space Flight Center in Huntsville, and a visit to the McWane Center in Birmingham, where students participated in a simulated Atlantis Mission to Mars.

Following each Symposium event, students are asked to complete a brief essay describing their experiences. These tell the story of the effectiveness of the plant tours and the opportunities to talk with employees, some of whom are only a few years older than the students themselves. Each essay is different but all students state that the symposiums have taught them the importance of education and the many benefits of preparing for jobs available in today's high tech manufacturing industry.

San Jac Students "Gear Up"

Students from San Jacinto College are gearing up for the Community College Aerospace Scholars (CAS) program, a state-funded initiative for students interested in the areas of science, technology, business, engineering, and mathematics. The CAS program is administered by NASA Johnson Space Center and coordinated by San Jacinto College. The program will help inspire and educate students enrolled in San Jacinto College's SpaceTEC pre-engineering and other technology programs.

The semester-long program includes online assignments under the direction of a NASA mentor prior to a three-day workshop at NASA's Johnson Space Center. During the three-day workshop, students are divided into teams. Each of these teams is considered a "company" with a designated budget. Throughout the three days, the company designs and builds a Rover that will navigate through an obstacle course. The winning team/company is recognized at the end of the workshop.

In addition to the Rover project, teams will also participate in other projects directed by NASA engineers; attend engineer, scientist and astronaut briefings; tour NASA Johnson Space Center facilities; and network with other students from the 52 participating community colleges across Texas.

"Involvement in the project excites students and emphasizes the need for what they are learning," says Dr. Sara Janes, Dean of Instruction at San Jacinto College North campus. "Students also learn the invaluable skills of working with others, running a small business, and making presentations."

Three separate workshops will be held in March and April for the more than 500 students that are expected to attend. Thirty students are expected to attend from three San Jacinto College campuses.

Calhoun Extends Training to SpaceTEC Partners

Following the adage, "More is better," Calhoun Community College recently extended the manufacturing concentration exam item development and review to include Cuyahoga (Tri-C) and Edmonds Community Colleges (Edmonds). Tri-C and Edmonds are both SpaceTEC partners with a manufacturing emphasis in their respective industrial communities.

In February 2006, Jim Swindell (SpaceTEC Co-PI) and Ann Coleman (Instructional Designer) conducted "on-boarding" workshops with administration, faculty/staff, and industry partners at Edmonds. These workshops included a concentration exam process development presentation and an extensive training session on "How to Write Exam Items." Edmonds instructional staff who will write exam items participated in the training session. Methods of writing multiple choice questions for the written portion of the exam were covered. The group also conducted an overview and practiced strategies for scripting oral questions and developing scripts and rubrics for practical/performance items. Similar training was conducted with Calhoun's and Cuyahoga's test item developers earlier in the process.

The intent of these intense training sessions is to define and utilize a common approach to the manufacturing certification exam development. This includes a consistent methodology to develop written, oral and practical elements of the exam.

Content validity and reliability are expected outcomes to this partnering. The focus is to align every test item to the related body of knowledge objective. Intercollegiate reviews offer this dimension of assurance. After these reviews are completed and the results incorporated into the test bank, industry subject matter experts from each respective region will go through a similar review before the question bank is taken to the beta testing level. At that point in time, a formalized statistical analysis will be conducted to ensure test reliability.

Project Genesis Extended
DOLETA 1A FLIES

The Department of Labor Grant, Project Genesis, has been extended through June 30, 2006. This extension includes a modification of work allowing alternate launch sites and commercial motors for the six Super LOKI launches.

In anticipation of the extension, SpaceTEC prepared rockets for launch at alternate sites. The first launch at Bunnell, FL, on December 10th proved to be disastrous — the rocket, powered by a K motor, deployed at 400 feet, shredding the booster. DOLETA 1A and DOLETA 2A were launched at West Palm Beach, Fl, on January 28. The rockets were prepped at the launch site and loaded onto the launch rods. The wind picked up and one of the launch lugs broke off, scrubbing DOLETA 1A (the "A" designates alternate motors or sites). DOLETA 2A (using launch buttons instead of launch lugs) also failed when the buttons were loosened as the rocket was loaded on the launch rail. The range closed before repairs could be made.

On Saturday, February 11, at Bunnell, FL, the repaired DOLETA 1A was loaded onto a 1-inch launch rail. Although range officials suggested canceling the launch to the wind advisories of 10 to 15 mph winds, DOLETA 1A launched at 11:10 AM, canting slightly to the NE to compensate for the steady winds. The liftoff was textbook perfect with a straight powerful takeoff using an I400 motor. At approximately 1000 feet the rocket reached apogee, tipped and continued on its horizontal course for another two seconds. As the rocket nosed over, the Ellis Mountain motor deployed the reduced size parachute. The rocket drifted quickly back to earth for an easy recovery. Slight damage to the Dart portion of the rocket occurred due to the decreased size of the parachute and its large spill hole, which created a harder landing than desired. Mr. John Edwards, the CAP rocket officer for Florida, assisted in launch preparations.

The February 14th launch at the Cape was scrubbed. The next launch for a Super LOKI at Cape Canaveral is in April on a yet to be determined date.

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To submit information for this publication, or to be placed on the mailing list, please write to the Office of Public Relations, Calhoun Community College, P.O. Box 2216, Decatur, AL 35609-2216, or call 256/306-2561.

www.spacetec.org

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SpaceTEC® Welcomes Doña Ana Branch Community College as Newest Academic Partner

Doña Ana Branch Community College (DABCC), located in Las Cruses, New Mexico, has recently joined the SpaceTEC partnership. The state of New Mexico is rapidly becoming a participant in the emerging field of "space commercialization" and has planned for the construction of the Southwest Regional Spaceport and formation of a New Mexico Office for Space Commercialization.

The advent of commercial space ventures is, in many aspects, a new frontier. DABCC seeks to remain closely allied with the practical needs of this new industry and has partnered with SpaceTEC to begin development of an Associate of Applied Science Degree in Aerospace Technology. Mr. Jerry Welch, Division Dean of Technical and Industrial Studies will serve as Co-PI representing DABCC.

DABCC is a subsidiary of New Mexico State University, and a Hispanic Serving Institution. For more information about DABCC see www.dabcc.nmsu.edu.

DABCC

Embry-Riddle Provides Opportunities for Students from SpaceTEC Partner Institutions

Embry-Riddle Aeronautical University is pleased to be a partner with SpaceTEC. The university is affiliated with the thirteen SpaceTEC partners and offers the opportunity for students to pursue baccalaureate degree programs through articulation and memorandum of agreement relationships. They may pursue these opportunities through the extended campus locations throughout the United States or overseas or through the Daytona Beach Charles Taylor Aviation Maintenance Science Department.

In addition to education and training programs, the Charles Taylor Aviation Maintenance Science Department provides examination services for Federal Communication Commission and electronic technician certifications. Embry-Riddle also has the capability of providing the SpaceTEC core examination through SpaceTEC examiner (STE), Tom Yanus. This enables the university to offer refresher course training and to conduct examinations.

SpaceTEC® Approves Technician Program

SpaceTEC announced on March 23, 2006, that Brevard Community College, Florida, has approved a 25-credit hour award for technicians completing all three parts of the core certification examination as part of their Associate's Degree program in aerospace technology. Incumbent technicians will now be able to sit for the examination and then enter the college with more than one third of the required credits for the AAS/AS degrees added to their transcript upon completion of 12 hours of coursework in the aerospace program.

Brevard and several other SpaceTEC colleges already use a similar approach to the FAA Airframe and Power Plant Certificate, awarding course credit to FAA-certified aircraft mechanics seeking an aerospace degree.

SpaceTEC will begin promoting the certification examination process nationally in conjunction with a core readiness course that will be available this spring for all participating SpaceTEC colleges.

Funded in part by a grant from the National Science Foundation