



iCMM SUCCESS TECH CENTER REACHES LEVEL 2!

On October 29, the FAA's Integrated Capability Maturity Model (iCMM) appraisal team announced the findings of the Tech Center's organizational appraisal. The Center received a Level 2 Capability rating in all four targeted Process Areas: Configuration Management, Contracts Management, System Test and Evaluation, and Transition. This success would not have been possible without a great deal of hard work and teamwork. Over the past year, ACT has documented its processes, placed them in a Process Asset Library (PAL), and created a system to maintain them. This was a massive effort that involved a lot of the time, energy, and dedication of many of the people who work at the Center. That effort, however paid off when the Center met the FAA iCMM Level 2 challenge of defining what they do and how they do it.

The final leg on the road to success began on October 4, when ACTers involved in the assessment process attended questionnaire sessions. The FAA Appraisal Team used the results of those sessions, in conjunction with document and work product reviews, during the subsequent interview sessions. One of the main purposes of the interviews was to demonstrate repeatability of how the Tech Center accomplishes its work. Appraisers conducted interviews with all levels of management from Anne Harlan to the project and team leads in the selected appraisal areas. Project practitioners were interviewed as subject matter experts within each of the four targeted Process Areas. In most cases, appraisers separated the practitioners into 2 separate groups to demonstrate that the Center's work is consistent and repeatable. Coaching sessions prior to the assessment stressed that the appraisal interviews would follow the same Base Practices and Generic Practices that have been fully supported in the branch and project

process documents.

Ensuring everyone knew their part to help the Center reach Level 2 has been an important goal for the Center. For example, as a part of the iCMM development, yellow cards listing the GPS and Process Areas have become a common sight throughout the Center. Special posters and flyers have been distributed and displayed championing FAA-iCMM and the PAL as the Tech Center's "key" to Process Improvement.

The writing and revision of documentation has been maintained at a high degree of activity in every level of the Tech Center over the past months. Much of this process improvement work is now reflected in the extensive technical inventory on the PAL. PAL serves as the permanent written knowledge-base for all ACT organizations (see August 1999 *Intercom* for additional information on PAL.)

In addition to the added value of enhancing overall work performance through process improvement, the iCMM effort has enabled everyone involved to have a direct impact on how they do their daily work. Through document writing, quality reviews, and peer reviews, the benchmarks for technical processes at the Center have been elevated to new levels. It is clear that process improvement has evolved in all aspects of Tech Center activities and has set the stage for enabling higher levels of performance. In fact, this effort has been so successful that process improvement is now a way of life for managers and practitioners.

This well-deserved success only helps to reinforce the Center's reputation as a world-class technology center.

Congratulations to all!!!

IT'S CFC TIME!



The Combined Federal Campaign (CFC) is the annual fund-raising drive conducted by Federal employees in their workplace each fall.

Each year Federal employees and military personnel raise millions of dollars through the CFC that benefits thousands of non-profit charities.

BACKGROUND

CFC's tradition of commitment to the community through the selfless efforts of Federal employees, has its roots in the many charitable campaigns of the early 1960s. Seeing a need to bring the diversity of fundraising efforts under one umbrella, Federal employees created the CFC -- one campaign, once a year. By allowing employees to select from a single guide making their contributions through payroll deductions, the CFC opened wide the door to more opportunities for generous giving to literally hundreds of worthy causes. An Executive Order made the CFC a reality, and turned an innovative idea into a uniquely effective way for Federal employees to help those in need across our community and throughout the world. The CFC is the only authorized solicitation of employees in the Federal workplace on behalf of charitable organizations. It continues to be the largest and most successful workplace fundraising model in the world.

YOU ACCOMPLISH SO MUCH WITH YOUR CFC GIFT

This year, many local, national, and international voluntary agencies will benefit from your thoughtfulness and generosity. A few minutes of your time today can mean meals for hungry children, relief for families in need of counseling, further work on cures for diseases, comfort for the dying, access to water in the Third World, environmental protection, and better lives and renewed hope for millions of people in our global community.

YOU CONTROL WHERE YOUR GIFT WILL GO

All Federal employees have the right to con-

tribute or not to contribute to the CFC. The choice is yours. Through your designation, you ensure that your donation goes to meet those needs that you feel are most important. You may indicate your choice by designating in the boxes provided up to five organizations. Except for documented expenses for the operation of the local CFCs and uncollected pledges, all contributions are distributed as designated. Each Local Federal Coordinating Committee, comprised of federal employees, must approve and monitor these costs.

PAYROLL DEDUCTION LETS YOU HELP ALL YEAR LONG

Payroll deduction is your key to substantial giving by letting you spread your contribution across the entire year. Last year, more than 91% of all CFC funds raised was given through payroll deduction. Payments on payroll deduction pledges begin on the first pay period in January. Because there is no simpler way for you to make good things happen for so many people, payroll deduction ensures your continuing role in the care and stewardship of your community and your world.

OPM PROVIDES CFC OVERSIGHT

The US Office of Personnel Management makes the final decisions on all charities eligible for the National List. It also is the final administrative level for appeals on national and local applications, provides guidance and technical advice on regulations, and has the authority to conduct compliance audits on any CFC fiscal records.

THE VOLUNTARY SPIRIT OF GIVING IS GUARANTEED

Remember, any contribution you make should be freely given. You have the right not to be improperly influenced in making your decision regarding the making or withholding of contributions in the CFC. Coercion is forbidden. To guarantee this voluntary spirit, the Office of Personnel Management has identified several practices that are not permitted, including but not limited to: supervisory solicitation of employees supervised; setting of 100% participation

IT'S CFC TIME

THE SPIRIT OF GIVING

goals; providing and using contributor lists for purposes other than the routine collection and forwarding of contributions and installment pledges; establishing personal dollar goals and quotas; developing and using lists of non-contributors.

THE SPIRIT IS ALIVE AT ACT

If you have any questions regarding this year's campaign, please contact CFC coordinator **Dave Maslanka** (ACT-600) or his assistant **Maria Lemmetti-Fane** (ACT-600).

UPCOMING CFC EVENTS

EVENT	Div/POC		DATE
Bagel Bash	ACT-50	Larry Levy	12/1
50/50 Guess	ACT-400	Julie Mueller	12/1
Mid-week Getaway Raffle	ACT-200	Jean Komenski	12/2
Outback Steak House Certificate Raffle	ACT-200	Jean Komenski	12/2
TGI Friday Certificate Raffle	ACT-200	Jean Komenski	12/2
Holiday Wreath Raffle and Blue Heron Dinner Gift Certificate	AOS	Peggy Stein	12/3
US Airline Ticket Raffle	ACT-70	Tina Fabrizio	12/3
Sub Sale	ACT-600	Frank Seman	12/7
Bake Sale	ACT-30	Mike Bralski/ Amanda Petitt	TBD

EXPLAINING FREE FLIGHT PHASE I

Robert Voss, Deputy Director for the FAA's Free Flight Phase 1 program office (AOZ-2), provided the kickoff dinner meeting presentation for the 1999-2000 year of the Southern New Jersey Sections of the American Institute of Aeronautics and Astronautics (AIAA), the Institute of Electrical and Electronic Engineers (IEEE), and the IEEE Computer Society, with an overview and update on the Free Flight Phase 1 (FFP1) program.

He explained how two groups -- the 1995 RTCA Select Committee for Free Flight, and the 1998 FAA Administrator's National Airspace System (NAS) Modernization Task Force -- paved the way for FFP1 by defining a set of core capabilities that would be required for Free Flight to work. The objective of the FFP1 project is to deliver, use operationally, and evaluate the performance of this core set of capabilities by the year 2002. Let's look at how this is being done, and the diversity of organizations involved in making it happen.

Agreements have been signed with the National Air Traffic Controllers Association (NATCA) and the Professional Airway Systems Specialists (PASS) organizations. NATCA and PASS are providing valuable insights into the performance and utility of the FFP1 technologies from the unique "front lines" perspective their membership brings to the FFP1 system evaluation program.

The National Business Aviation Association (NBAA) is

an industry group that has identified investment in FFP1 technologies as a key enabler to enhancing the safety, efficiency, and capacity of our National Airspace System. To learn more about NBAA's support of the FFP1 program, visit their website at <http://www.nbaa.org/issues/modernize.htm>.

Another FFP1 stakeholder is the Air Transport Association (ATA). Some of you may find this surprising, since on October 13th ABC TV Nightly News ran a lead story reporting how ATA President and CEO Carol B. Hallett had criticized the FAA for contributing to the flight delays experienced this summer during her keynote speech to the RTCA 1999 Annual Symposium. But her criticism of the FAA was only part of the actual speech she made. What ABC did not report was that at the outset of her remarks, Hallett praised RTCA's support of Free Flight Phase 1 as laying "the groundwork for future successes."

Hallett also went on to question how FAA could be reasonably expected to fulfill its research role in light of recent action by the Congressional appropriations committees cutting funding to RTCA as a key FFP1 participant. The complete text of her speech to RTCA is available at <http://www.air-transport.org/public/speeches/51.asp>.

Another FFP1 stakeholder is the Aircraft Owners and Pilots Association (AOPA). AOPA's website describes how this critically important FFP1 stakeholder organization is supporting of the "AIR-21" legislation (H.R. 1000),

presently working its way through Congress. AOPA's website is urging its membership to make its voice heard. It is important to note that Section 1305 of H.R. 1000 in its present form includes a provision whereby the FAA Administrator will submit to Congress "a definitive plan for the continued implementation of Free Flight Phase 1 operational capabilities for fiscal years 2003 through 2005. (See <http://www.aopa.org> for the latest on AIR-21, plus a direct link to the "Thomas" website text of this potential watershed piece of legislation). Other FFP1 stakeholders include NASA, DOD, Mitre, ARINC, and the Airline Pilots Association International (ALPA).

It is clear that FAA is not alone in the FFP1 effort. Now let's take a closer look at some of the new systems and technologies being evaluated under the FFP1 program. At the AIAA/IEEE dinner meeting, Voss explained, "Any activity which removes restrictions represents a move towards free flight." The point is that the NAS is a highly complex and integrated system, and changes will be tested and implemented incrementally.

He next led the attendees on an imaginary airline flight guided by FFP1 technology. As your aircraft rolls-back from the gate and prepares to taxi out to the runway, a FFP1 tool called Surface Movement Advisor (SMA) monitors your aircraft position on the taxiway and runway. The SMA will also track your aircraft when you enter the terminal airspace on final approach for touchdown at

FREE FLIGHT PHASE I

your destination airport. The aircraft arrival information that SMA provides can be used by ground control to better manage taxiway and runway traffic. It can also help airline gate managers to compute their aircraft's estimated time to touchdown and arrival at the gate. This in turn allows for better planning, allocation and utilization of terminal gate resources.

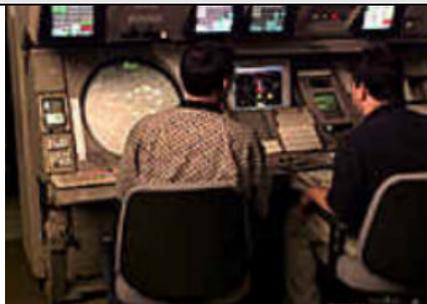
During takeoff, as your aircraft climbs out through terminal airspace, and when it eventually reaches cruising altitude in EnRoute airspace, a FFP1 technology called Collaborative Decision Making (CDM) is being used at



the FAA Command Center in Herndon, VA, and by your airline control center so they have a common picture of the NAS airspace status along your intended flight route, including weather, equipment, and any ground delays.

Voss explained that this technology is already being tested, and some early benefits have already been identified. For example, he cited that United Airlines at San Francisco Airport (SFO) saved \$19M over twelve months, and system-wide, over 3,200,000 minutes of flight delays were avoided between September 1998 and August 1999 due to better planning and decision making supported by CDM data.

As your aircraft cruises through EnRoute airspace, another FFP1 tool called User Request Evaluation Tool (URET) provides EnRoute controllers with a conflict



probe capability. Using URET, a controller can model the affect a requested change in flight path from one aircraft may have upon other aircraft sharing the adjacent airspace, and identify any potential conflicts that could arise, both within the current sector as well as across sector boundaries. URET prototypes have been deployed at the Memphis (ZMP) and Indianapolis (ZID) ARTCCs for use and evaluation by the EnRoute controllers who work there. The information gathered will be evaluated by the FAA and by the FFP1 stakeholders.

Traffic Management Advisor (TMA) is a FFP1 technology that will help EnRoute controllers and traffic management specialists optimize an efficient arrival sequence for your flight as it approach the destination airport. Voss said the FAA is running a spiral development process on the TMA project. Ft. Worth (ZFW) Center is modeling the first spiral of TMA, known as the "current build prototype." The Centers at Miami, Los Angeles, Atlanta, and Denver are also participating in the early prototypes of TMA. Early results using TMA and pFast (another FFP1 tool described below) indicate that up to 12 additional aircraft per hour can be landed during peak periods.

As your aircraft descends into terminal airspace in preparation for final approach and landing, the Passive Final Approach Spacing Tool (pFAST) maximizes runway utilization by providing controllers with aircraft sequence numbers and runway assignments according to user preferences and system constraints. A prototype of this FFP1 tool has been deployed and is under evaluation at Dallas-Ft. Worth (DFW) airport, one of the busiest airports in the nation.

Summing up the benefits of FFP1 tools, Voss provided a useful clarification. "These are strategic planning tools, they're not like MSAW or Conflict Alert, they're not keeping metal separated in the air, but rather they are providing new tools to help us optimize overall ATC system performance" he explained. Fielding questions from the audience, he noted that both pFAST and TMA are "extremely site-adaptation sensitive", meaning they must be configured to the airspace and route characteristics of each deployment site.

Metrics are in place to help quantify risk and human factors issues. FFP1 has a Risk Management Plan and a Risk Review Board that is chartered to monitor the evaluation results for each FFP1 tool, to help identify and rate the risks associated with each tool. A Risk Action Plan is used to help the FFP1 Risk Managers decide which risks can be accepted, and which risks require remediation.

Risk Records are maintained and provide the description,

FREE FLIGHT PHASE I

assessment, action plan, and status details for each risk item. Voss explained that the goal of the risk mitigation action plan is simply to reduce risk exposure to an acceptable level, and to improve the odds for program success through actionable metrics.

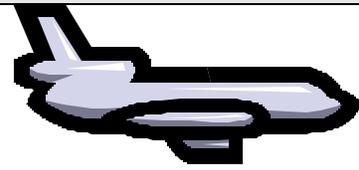
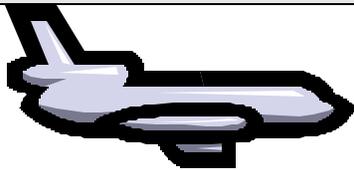
A human factors rating system known as "CARS" is being used by the controllers to record their perceptions relative to the performance of all FFP1 tool features. Numerical ratings on a scale of 1-10 are collected and averaged to develop a letter graded confidence level for each FFP1 test configuration.

Voss closed his presentation by saying that the FFP1 program office welcomes questions and comments, and can be contacted either by email at ffp1@faa.gov, or via their website at <http://ffp1.faa.gov>.

The AIAA and IEEE thank Mr. Voss for coming to Southern New Jersey and sharing his insights into the truly groundbreaking work that is being performed under the FFP1 program. As always, guests who are not yet members of AIAA or IEEE are encouraged to come out and join us at these dinner meeting, you can be sure we will be glad to see you there. So watch the Center News for upcoming events and phone in your reservations.

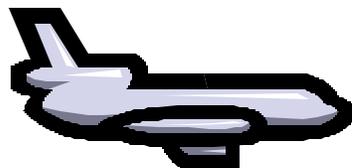
Thanks to John R. Gross, AIAA Southern NJ Section, for writing the article.

5 WAYS TO GET MORE ELBOW ROOM ON THE PLANE



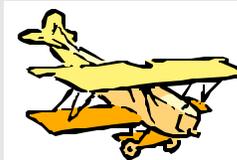
1. **Choose a big airplane.** Ask your travel agent which flight has the largest plane available and book that one.
2. **Book a midday flight.** This avoids the morning and after business hours rush.
3. **Fly on Saturday.** It isn't as busy and still allows you to fulfill the Saturday overnight requirement.
4. **Ask for an aisle seat.**
5. **Sit in the back of the plane.** It's less popular and often less crowded.

(From *First Draft*,
January 2000)





SAFETY FIRST!



In 1920, the U.S. War Office set the following regulations for Operation of Aircraft:

1. Don't take the machine into the air unless you are satisfied it will fly.
2. Never leave the ground with the motor leaking.
3. In taking off, look at the ground and the air.
4. Never get out of a machine with the motor running until the pilot relieving you can reach the engine controls.
5. Pilot's should carry hankies in a handy position to wipe goggles.
6. Riding on the steps, wings, or tail of a machine is prohibited.
7. In case the engine fails on takeoff, land straight ahead regardless of obstacles.
8. No machine must taxi faster than a man can walk.
9. Never run motor so that blast will blow on other machines.
10. Learn to gauge altitude, especially on landing.
11. If you see another machine near you, get out of the way.
12. Do not trust altitude instruments.
13. Before you begin a landing glide, see that no machines are under you.
14. If flying against the wind and you wish to fly with the wind, don't make a sharp turn near the ground. You may crash.
15. Motors have been know to stop during a long glide. If pilot wishes to use the motor for landing, he should open throttle.
16. Don't attempt to force machine onto ground with more than flying speed. The result is bouncing and ricocheting.
17. Pilots will not wear spurs while flying.
18. Do not use aeronautical gasoline in cars or motorcycles.
19. Never take a machine into the air until you are familiar with its controls and instruments.
20. If an emergency occurs while flying, land as soon as possible.

PLEASANT DREAMS CAN

BECOME A NIGHTMARE

A SAFETY MINUTE

**BROUGHT TO YOU BY THE SAFETY OFFICE,
ENVIRONMENTAL BRANCH (ACT-640), X6360**



A cool mist hovers just above the ground where leaves now dot the terrain with a full array of colors. The trees are now barren, their limbs sway back and forth by a north wind. As you begin your work you notice how cold and crisp the air is. You think to yourself, there's nothing like being alone in the woods, in touch with nature and its beauty. It's like a pleasant dream. But wait, what's this? You realize that you're bleeding, the pain is great, and you've got a ways to go to get help - oh no - your pleasant dream is in fact a nightmare! What went wrong?

What went wrong is your lack of safety preparation and use of the chain saw that you were using to cut up firewood. It would seem that you're day dreaming caused you to lose focus of the task at hand and you not only cut the tree limb, but you cut your leg as well.

While this scenario may sound outlandish it happens more than you might think. We bring the subject of chain saws up now, as it is the time of year when people use chain saws to cut up firewood and wood stock for heating purposes. To assist you in using a chain saw safely we have listed a few safety tips below:

- **Always start the saw on the ground, not on your knee or in the air.**
- **When carrying a saw any distance, carry it by the handle, with the motor stopped and guide bar to the rear, in such a way that you can throw the saw clear in case you stumble or fall.**
- **Shut the motor off and let it cool before refueling.**
- **When operating a chain saw, wear the appropriate safety attire, like a safety hat, safety shoes, and safety glasses.**
- **Keep a first-aid kit and a fire extinguisher handy.**
- **When moving from tree to tree, make sure your finger is not on the saw trigger in case you fall.**

As a final thought, dreams can come true! By staying focused on the chain saw and the task at hand your memories won't be a nightmare.



EMPLOYEE EXPRESS



WHAT IS IT?

An automated system that employees can use to make basic Payroll and Personnel changes, without the need for paper forms.

WHAT CAN I DO WITH IT?

Employees can make the following changes at any time:

- Federal/State Tax Withholdings
- Direct Deposit of Paycheck
- Direct Deposit of Allotments
- Change of Home Address
- Change of PIN
- Cancel FEHB enrollment
- Change from Family to Self Only FEHB Coverage
- Cancel TSP Participation

During the appropriate Open Seasons, employees can make the following changes:

- FEHB - Enroll, Change from Self to Family, Change from one plan to another
- TSP - Enroll, Change Contributions, Allocate Contributions

SPECIAL FEHB EVENTS

Changes cannot be made using Employee Express during Open Season when paper forms are required. Special Events include things such as a change in marital status or the birth of a

USING EMPLOYEE EXPRESS

child. Special Event changes are usually effective right away, while Open Season changes are not made until the Open Season effective date - January of the next year. If you want to cancel or reduce FEHB or TSP coverage during an Open Season, and if you want the change effective right away, you must submit a paper form.

WHAT DO I NEED TO USE EMPLOYEE EXPRESS?

You should have the following information ready when you call: social security number; PIN; most recent pay stub; and any other information required for the transaction you are making.

WHAT IF I LOSE MY PIN?

Call the Employee Express Help Desk at (912) 757-3030. A new PIN will be mailed to your current home address. (NOTE: If your address is not currently up-to-date, you will need to submit Form DOT 2730.2, Employee Information Form, first.)

HOW WILL I KNOW THE EFFECTIVE DATE OF AN ACTION?

Once you have confirmed your transaction and indicated you have no further actions, Employee Express will give you an effective date. Watch your Statement of Earnings and Leave to ensure the changes have occurred.

WHAT IF I CHANGE MY MIND ABOUT A CHANGE I MADE WITH EMPLOYEE EXPRESS?

You must cancel the change

using Employee Express before the effective date. You cannot submit a paper form to correct or cancel an Employee Express action, and you cannot use Employee Express to correct or cancel an action submitted on a form. You must use the same method to correct/cancel an action as you used to enter it.)

WHAT IF I NEED PROOF OF HEALTH INSURANCE BEFORE I GET MY ID CARD?

Call the Employee Express Help Desk. They will send you written confirmation of your new health benefits coverage. (NOTE: It is recommended that you update your prescriptions, make routine medical appointments, etc., before your old coverage expires. This will help alleviate problems before your new ID cards are issued.)

WHAT IF I NEED HELP OR MORE INFORMATION?

You can call the Employee Express Help Desk or the Human Resource Management Division, Employee Services Team:

Leona Wilkes, X8897
Patricia Sampson, X4669

IMPORTANT PHONE NUMBERS

EMPLOYEE EXPRESS:
1-800-827-6289 or (912) 757-3084

HELP DESK: (912) 757-3030

TDD: (912) 757-3117

EMPLOYEE EXPRESS CAN BE ACCESSED 24 HOURS A DAY, 7 DAYS A WEEK

Headquarters Headlines

FAA and NASA Reach Agreement to Share Information on Reusable Space Vehicles.

The FAA and NASA have signed the first-ever Memorandum of Understanding (MOU) concerning the future of space transportation research activities. The agreement describes the two agencies' cooperative research and development activities regarding Reusable Launch Vehicle (RLV) technology.

"I envision this agreement to be the cornerstone of enhanced cooperation between the FAA and NASA with respect to commercial space transportation and it will have a positive impact on both agencies," said FAA Associate Administrator for Commercial Space Transportation Patricia Grace Smith. "This is an exciting time for commercial space transportation and we are eager to work with NASA to develop a mutually beneficial research program to further the needs of the commercial space launch industry."

The objective of the MOU is to promote collaborative use by the FAA and NASA of technical information, research results, and potentially funded activities which will assist each agency in fulfilling its respective roles and responsibilities. Information and study results to be exchanged include:

- RLV system development, technology, maintenance and operations;
- Launch and reentry site infrastructure and integration into the National Airspace System;
- Training and health requirements for future crew and passengers;

Headquarters Headlines

- Environmental effects of space transportation systems; and
- Other specific areas of collaborative work in the area of future space transportation systems that may be of mutual benefit.

Organizationally, this agreement links the FAA Associate Administrator for Commercial Space Transportation with NASA's Associate Administrators for Aero-Space Technology, Space Flight, and Life and Micro-Gravity Sciences and Applications.

Within the FAA, Smith has established working councils and integrated product teams to support RLV development with the associate administrator of air traffic services and the associate administrator for regulation and certification.

The FAA and NASA have had a long-standing working relationship, particularly in the areas of environmental reviews and safety programs for experimental space activities. The two agencies have also worked closely in the development of launch and reentry sites known as Spaceports.

FAA to Purchase Newly Certified Explosives Detection System.

On November 2, the FAA announced it has awarded a contract worth up to \$75 million to L-3 Communications of NY to purchase up to 60 of its explosives detection systems. L-3 Communications is the second manufacturer to offer a system to meet the FAA's rigorous certification standards.

Under the contract, the FAA

can purchase up to 60 eXaminer 3DX 6000 explosives detection systems over three years. The first four units acquired will be used for acceptance testing procedures and operational testing, as well as to finalize training procedures for the airline operators. Once testing is complete and any necessary refinements made, up to 56 more systems may be purchased under the same contract for operational deployment to the nation's airports.

Before the L-3 Communications eXaminer attained certification, InVision Technologies of Newark, CA, manufactured the only FAA-certified system available. Both company's machines use computed tomography ("CAT scan") technology adapted from the medical field to detect a wide range of explosives, and both combine high detection rates with low false alarm rates.

The FAA has purchased 110 CTX-5500 systems from InVision to date, and recently issued a contract to buy four CTX-9000s, InVision's newly certified next-generation system, for operational testing and deployment. Once the system is validated in the field, FAA can purchase up to 60 CTX-9000s over three years under this contract, which is potentially worth a maximum of \$71.3 million.

The three certified systems--two from InVision and one from L-3--give FAA a choice among types of machines and vendors, furthering the agency's goal of encouraging competition in this emerging market.

FAA Proposes Rules Enhancing Fuel Tank System Safety.

On October 28, as part of its continuing effort to improve fuel tank safety, the FAA proposed a three-pronged rulemaking package that includes setting new certification standards and mandatory maintenance instructions on fuel systems for newly designed aircraft. It also calls for design reviews and mandatory maintenance on existing aircraft.

The Special Federal Aviation Regulation (SFAR), affecting 6,000 aircraft in the current transport fleet with 30 or more seats, would require a design review revalidating the fuel tank system design to ensure that failures could not create ignition sources within the fuel tanks. Manufacturers would also be required to design specific programs for the maintenance and inspection of the tanks to ensure the continued safety of fuel tank systems.

The proposal also calls for changes to aircraft operating rules, requiring operators to develop and implement an FAA-approved maintenance and inspection program for fuel tanks. The SFAR can be obtained on www.faa.gov/avr/arm/nprm/nprm.htm.

The proposed design standards call for a new flammability standard for newly designed aircraft, which minimizes the development of combustible vapors in fuel tanks. Alternatively, manufacturers must provide a means to prevent catastrophic damage if ignition does occur. The new standard also requires assessment of

Headquarters Headlines

whether ignition sources could be created by failures and for the development of mandatory fuel tank maintenance and inspection programs for newly designed aircraft.

The new certification standards represent a new approach, which builds upon the existing standards requiring fuel tank design and maintenance philosophies to eliminate ignition sources. The new standards call for manufacturers and operators to go a step

further to minimize the development of or mitigate the impact of combustible vapors and their potential to cause a fire or explosion in the fuel tank system. Previous design philosophy addressed the prevention of ignition sources as a means of eliminating one side of the "Fire Triangle" as opposed to the oxygen or fuel flammability sides.

Manufacturers would have 12 months from the date of the final rule to comply with its provisions

for conducting safety reviews and developing the required maintenance and inspection programs. Operators would have an additional six months to incorporate a FAA-approved maintenance and inspection program. Together, the cost of these initiatives is expected to be \$170 million over 10 years. The comment period for the rule-making package is 90 days from publication in the Federal Register.

News From Around the Center

Cheers to Tech Transfer Team.

Recently, Ron Morgan (AAT-1) sent a letter of Appreciation to the Office of Aviation Research commending the work of the Technology Transfer Office. He wrote, "my office executed a Cooperative Research and Development Agreement (CRDA) . . . to explore advanced technology user interface design alternatives for a next generation voice communications system for national traffic managers . . . I commend the extra effort and attention invested by **Jennelle Derrickson** and **Marie Denan** (AAR-400) in executing the CRDA agreement . . . their personal attention to this project is greatly appreciated. They have provided me, and the air traffic team involved, with outstanding service . . . this project has real potential to help the agency meet the challenges we face in communications with our stakeholders and improving the performance of the national

traffic managers at the ATCSCC. I am counting on these two individuals for continued support as an important element of our future success."

Kudos to LAAS Team. Recently Phil Boughton, VP, Airline Industry Affairs for DORS Intl Satellite Navigation Solutions, sent an email to **Stan Pszczolkowski**,



congratulating and thanking ACT employees for their recent work. Phil wrote "Wow, what a great demonstration of FAA talent! Your team in Memphis impressed everybody they encountered. The Memphis Airport people called and told me how nice it was to have the LAAS team in Memphis

and how great it was to work with such professional people. In particular they mentioned **Cliff's [Macklin]** smooth organized manner in laying out the LAAS installation plan . . . Ron Wickens could not stop commenting on the quality of your people and the performance of the LAAS system. After talking with your people, such as **John Warburton**, when they were operating the LAAS on the MD-10 he really understands the way the system is designed. He was impressed with the accuracy and the availability of the LTP system while in Memphis. Ron would like to write a quick note to each of your team members thanking them for their long hours and quality work . . . I spent several hours at the LAAS test site showing visitors and CBS camera crews the actual equipment that is LAAS. Your team put in very long hours in the blowing cold and were always cheerful and ready to explain to each new group the

Around the Center



details of the ground station. **David Lamb** and **Tom D'Ottavi** kept the LTP manned and **Mark Dickinson** and **Carmen Tedeschi** kept the pseudolite going while **Ruben Velez** worked both sites . . . Your team was spectacular."

Congrats to ACT-73. James Erickson, FAA's director of Environment and Energy (AEE-1) recently sent a letter to **Bob Marks** thanking **Mike Roames** and his colleagues in ACT-73 for supporting AEE at the FAA's exhibition at the National Association of State Aviation Officials in Williamsburg, VA (see photos in October *Intercom*). Erickson wrote, "As you know this was a joint FAA and NASA endeavor, and required considerable coordination between various elements of the agencies. With just a few weeks notice, Mr. Roames, et al., produced a first class environment exhibit. Their patience, hard work, and professional creativity are greatly appreciated."

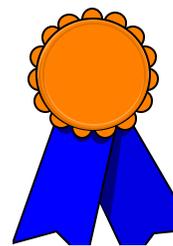
Ed Coleman's the Best. The Southern New Jersey Professional Societies (IEEE and AIAA) recently named **Ed Coleman** (ACT 330) Engineer of the Year for his work on vocoder technology.

Hooray to Dot Buchanin. On November 18, during Employee Recognition Day, Secretary of Transportation Rodney Slater recognized **Dot Buchanin** (ACT-300) as part of a FAA team that worked with the NSTC Committee on Technology Subcommittee on Transportation Research and and Development.



Well Done Tom Chamberlain. Secretary Slater also presented **Tom Chamberlain** (AAR-500) with a meritorious service award for his work synthesizing and characterizing a new terrorist explosive, Triacetone Triperoxide (TATP). This compound recently appeared as a weapon of mass destruction in the Middle East.

Attaboy for Dave Galella. Genia Embrey in the AAR-1 front office thanks AAR-400 "for the great team work in completing the Report to Congress on Aging Aircraft Research . . . Through the diligent efforts and coordination of **Dave Galella** (AAR-433) with the Sandia National Laboratories personnel, the report was finished in August" and is on its way to the Hill with FAA and OST approval.



LAAS Tests Completed With Industry

You may have overheard some FAA people talking about what sounds like fake lights being used for aircraft landing. In our current budget situation this seems almost believable. But it isn't true. These "fake lights" are "pseudolites" and are part of the FAA's Local Area Augmentation System (LAAS) efforts.

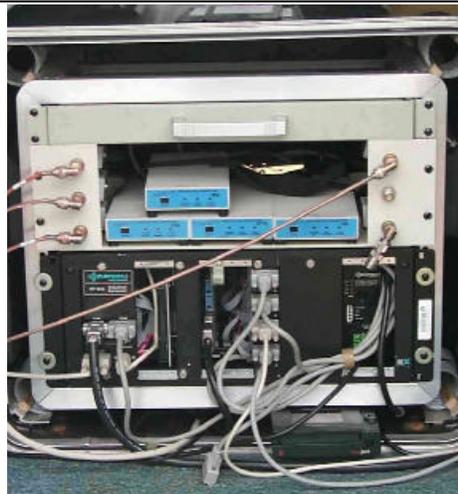
LAAS enhances the accuracy and availability of the Global Positioning System (GPS) to permit landing in all weather conditions. It receives the same GPS signals as aircraft in the approach phase of flight, calculates a correction, and transmits it to the aircraft via a VHF data link. The basic GPS constellation does not have the required availability to permit Category II (1×10^{-7}) or Category III (1×10^{-9}) operations. This availability is achieved by the installation of a LAAS ground component called a pseudolite. A pseudolite broadcasts a GPS message in the immediate vicinity of an airport.

Since it originates from fixed ground equipment and not from a "real" GPS satellite, it is called a pseudolite.

The pseudolite concept has been around for several years. The Tech Center has participated in a number of evaluations



LAAS Test Prototype reference stations installed at Memphis.



LAAS Test Prototype master station.

where a pseudolite has been incorporated into a prototype LAAS. The pseudolite seems to be viable but has three major technical challenges:

1. Signal Reception - Can the signal, transmitted by a ground facility, be reliably received by a GPS antenna installed on the fuselage top of an in-flight aircraft?
2. Signal Strength or the "Near-Far" problem-- How can a ground facility, less than 20 nautical miles from the aircraft, transmit a signal with similar characteristics as one that originates 11,000 nautical miles away without overpowering it?
3. Accuracy - Can the system synchronize its clock with GPS time to provide the needed accuracy?

Based on tests with a variety of aircraft, the answers to these questions appear to be "yes." However, the largest aircraft

involved was our B-727.

Since wide-body aircraft would also use LAAS, these results have been questioned by industry and standards development organizations. The sheer size and flight characteristics of a B-767 or a DC-10 could affect signal reception, strength, and processing. To validate our results, the FAA entered into a cooperative agreement with the Air Transport Association (ATA) to obtain access to a wide body aircraft for further tests.



UPS B767 completing a LAAS Test Prototype guided approach to runway 13 at Atlantic City International Airport.

In July a team of Tech Center, Headquarters, and Flight Standards people, along with representatives from ATA, met separately with senior engineering and operations personnel from United Parcel Service (UPS) and FedEx to plan wide-body LAAS tests. Under the leadership of **John Warburton** and **Cliff Mackin** (ACT-360) the UPS tests were conducted a month later (August 14-15) and the FedEx tests were completed in early November.

LAAS Tests Successful

The UPS tests utilized a brand new, right off the assembly line B-767. **Dean Joannou** (ACT-360) and **Carmine Tedeschi** (SRC) traveled to the Seattle area to install our equipment rack. The aircraft arrived at the Tech Center on Saturday morning and left Sunday afternoon after completing 39 approaches to all 4 runway ends. These tests were successful in that the aircraft did receive the signal and was able to correctly process it. **John Warburton** presented the results of this test at a meeting of the Institute of Navigation and at an ICAO meeting. However, certain parameters required modification for the pseudolite to provide the required Category III performance.

The FAA verified these changes on October 30 - November 3 in Memphis, TN, using a FedEx MD-10. Testing at Memphis offered its own challenges above what was encountered in Atlantic City. Researchers had to determine appropriate on-airport siting for our ground equipment and antennas, transport and install this system, verify its operation with one of ACT's aircraft, install an avionics rack on board the experimental MD-10 and schedule flights around the operations of a busy airport.

Initial data analysis indicates that the issues discovered with the B-767 have been resolved and that the Local Area Augmentation System, with a pseudolite, can provide Category III service to all types of aircraft. The final results will be presented to RTCA and ICAO for the revision and validation of their standards.

These results also reduce the risk of the FAA's planned LAAS Category II/III development. Most of the 45 approaches flown to the six runway ends in Memphis were straight-in ILS look-alikes. In addition, several advanced operations (e.g. offset approach, short turn to final) were conducted based on profiles developed by Jim Nixon from the FAA's Flight Standards office. The MD-10 was able to use LAAS guidance to complete these profiles.

These tests could not have been conducted without the sponsorship of the GPS Product Team and the LAAS manager, **Ray Swider**; the participation of the Air Transport Association (ATA); the commitment of people, funds and equipment by UPS and FedEx; the cooperation of the Memphis Airport Authority; the

help of FAA air traffic, airway facilities, and flight standards district office personnel, and the hardwork and dedication of the Tech Center Team.

This team, led by **Cliff Mackin** and **John Warburton**, included **Dean Joannou**, **Dave Lamb** (SRC), **Mark Dickinson** (ACT-360), **Tom D'Ottavi** (ACT-360), **Jim D'Ottavi** (ACT-360), **Carmen Tedeschi**, **Ruben Velez** (ACT-360), and **Keith Biehl** (ACT-370). These individuals worked long hours over several weekends under very physically demanding conditions. The challenges included flying in the windowless cargo area of a constantly maneuvering aircraft to monitor signal reception, operating the ground equipment in the heat of July and the cool and windy November mornings, driving an equipment van to Memphis and back and interrupting family vacations. The team maintained a professional and can do attitude through these tests that greatly impressed the people from UPS, FedEx and ATA.

Both tests received very favorable media coverage. In Memphis, FedEx hosted an industry day and a major media event. Attendees were given the opportunity to fly LAAS approaches on board the DC-10. Included were the CEO of FedEx and the head of research for John Deere. Both were very favorably impressed and John Deere will pursue research on the use of LAAS to precisely apply agricultural products.

While in Memphis the team demonstrated that you cannot live by RF energy alone. They ate some outstanding barbecue, filled up on hush puppies, visited Graceland, but did not see Elvis.



The FedEx MD-10 completing a LAAS Test Prototype guided approach to runway 18R at Memphis International Airport. The pseudolite antenna appears on the left side of the picture.

Going Down!

On October 21, Crashworthiness Program (AAR-431) personnel conducted a dynamic drop test of a 500-gallon conformable auxiliary fuel tank, installed in the cargo compartment of a ten-foot long narrow body fuselage section. The fuel tank contained 3,370 pounds of simulated fuel. Also onboard were 6 instrumented anthropomorphic test dummies, 12 mannequins, and representative airplane seats. The test article had a combined weight of 8,780 pounds. In addition, 121 channels of data were collected.

Researchers spent months preparing for the test that dropped the airplane section 14 feet. The force of the impact broke two floor beams, ruptured the fuel tank, and violently shook the crash dummies, which were belted in their seats. The final impact velocity was 30 feet per second.



buckled upwards. Some floor mounted seat tracks were also broken.

This testing is part of the requirements of the Aviation Safety Act of 1988 which, among other things, seeks to decrease the incidence of post crash fuel fed fires. The nature of this testing is pro-active. The data analysis and final report publication is expected to take approximately 9 months.

The FAA's crashworthiness research program has two specific technical goals: the elimination of structural design, manufacturing, or maintenance faults that could lead to an accident and the improvement of crash design features to provide better protection for passengers and crew in an accident.

The goal of the test was to create conditions similar to that of a severe, but survivable crash. "In air crashes where most of the passengers and crew can survive the initial impact, fuel fires pose a serious danger," said project manager **Gary Frings**. The objective of this test was to evaluate the structural integrity of the auxiliary fuel tank, its fuel containment characteristics, and its effect on the cabin floor (structural and response) when subjected to a severe but survivable impact condition. Preliminary analysis of the data indicates that the test article was subjected to approximately 30 to 50 g's, and the cabin floor



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