



Society of Aircraft Performance and Operations Engineers

Welcome to the SAPOE newsletter. Please feel free to contribute ideas and articles for future newsletters.

A Quarterly Newsletter

Issue 2 - Autumn 2011

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SRO!

The 2011 SAPOE Conference was indeed Standing Room Only!

Exceeding all expectations, 54 members from 37 airlines and other member organizations attended the 2011 SAPOE Conference in Miami.

Presentations were given with topics such as Fuel Management, Airspace Protection Near Airports, Emergency Descents, Operational Landing Distances, Procedure Design, Runway Excursions, and a New Perspective on Performance Data. The presentation materials are available in the Members Only section of sapoe.org.

Other relevant happenings at the conference include the announcement that the SAPOE Constitution had been accepted by the membership, and formally adopted by the conference attendees.

SAPOE would also like to thank our gracious gustatory sponsors (alphabetically): [AeroData](#), [The Boeing Company](#), and [MacDonald, Dettwiler, & Associates \(MDA\)](#).

President's Message

Roy Maxwell is the founding president of SAPOE and the principal performance engineer at Delta Airlines.

By all accounts, the SAPOE Conference in October was successful, and an important building block to ensure the Society's lasting value to our membership. I certainly found it informative and enjoyable, and for those of you who shared your similar thoughts with me, thank you! Early next year, we will begin serious planning for the 2012 Conference, so if you have any ideas or suggestions you would like to share with the officers, it is a good time to do so. The feedback we got at the Conference was that scheduling it right after the IATA Aircraft Performance Working Group in Miami worked well, and that we should consider that again next year. But we are open to other ideas if they arise. We are an international organization and I would welcome a proposal from someone to host a conference in another part of the world.

One of the things we discussed at the Conference was the future role of SAPOE in developing guidance, recommended practices, or standards in our area of expertise. For years, even before SAPOE

was formed, our members have served on industry committees and other forums developing such guidance and regulations, and that is an important contribution which will continue. The question is whether SAPOE should form committees or working groups to develop comments, position papers, educational materials, recommended practices, technical standards, proposed regulatory changes, professional standards, or some other document that would be issued in the name of SAPOE. You can see this covers a pretty broad area of potential activity, and we have no structure in place or guidance about how such activity should be conducted. The Constitution addresses technical papers presented at the Annual Conference and the formation of committees to advise the officers, and for transacting certain affairs of the Society. But all the details beyond that are left to the discretion of the officers. And we have no desire to do anything that is at odds with the wishes of our members. So to get started, we officers have decided to solicit proposals from the membership for a small project we could use as a prototype and learn as we go, about what processes and guidelines we need to consider for bigger and more complex projects. Ideally, it would be something relatively easy to accomplish, and likely to produce non-controversial *(continued on page 2)*



Treasurer's Report

*Mike Byham is the founding treasurer of SAPOE and the director of Operations Engineering at US Airways. Mike still insists that members establish a V1 policy *before* getting into your car.*

Hello Members,

Not much exciting happening in the way of finances (and that's a good thing). By the end of September 2011, we had a total of over \$6,200 in our account. We spent a portion of this amount on our annual conference in October, but with some careful planning and exercising fiscal responsibility we've kept this to less than \$1,500. We also spent some money (\$1,020) on gifts for members (that's you)! These gifts (SAPOE-branded mouse pad and microfiber cleaning cloth, shown above) were distributed to members able to participate in the conference. They are also being made available to members unable to attend the conference. These gifts are yours for the asking – we simply request that you pay for postage.

We have collected over \$500 in the recent month for member dues and shirt sales, so despite the spending for the conference and the gifts, the net resulting balance as of this writing is over \$4,200. We anticipate this total to increase to close to \$7,000 once 2012 member dues are paid. Per the requirements of our newly ratified constitution, you can expect to see an invoice for 2012 dues prior to January 1st, 2012. If you have already paid your dues for 2012 (thank you!), you will still receive an invoice, but it will show a zero balance.

We found that we have an ability to make use of resident website tools to conduct surveys so we have discontinued a month-to-month arrangement we had with Survey Monkey saving \$20/month.

Since we have promised to be completely transparent with the Society's finances, we continue to post a workbook showing income and disbursement of funds on the website. It is available in the "Members-Only" section.

You'll notice that there are two bottom lines – one that includes the funds residing in PayPal and one that doesn't. The funds are transferred from the PayPal account to the SAPOE bank account on a random basis and ad hoc when necessary. Your dues will show up in the "Donations" line as

Membership Report

Walt Blake is SAPOE's membership coordinator and a retired Boeing Flight Operations Engineer. The following is a summary of his membership report from the 2011 Conference.

As of the end of 2010, SAPOE's membership was at 132. However, membership as of the 2011 Conference had stagnated at 130. SAPOE now has representatives from 46 airlines (an increase of 14 since the beginning of 2010) spanning 29 countries (up 7). There are also 22 affiliated organizations (manufacturers, regulators, etc.) taking advantage of the SAPOE network.

The full membership report is available on the Publications page in the Members Only section of sapoe.org

If you have any questions or comments about the membership process, such as changes to your data in the roster, those concerns can be sent to Walt at membership@sapoe.org

President's Message (continued)

results that would be generally viewed as a contribution to the profession. So, ideas, please! Direct your suggestions to any or all of the officers. My thinking

The next couple of years could be very interesting for performance engineers. The FAA is starting work to revise Advisory Circulars and other guidance dealing with weight and balance, and airport obstacle analysis. And we all know that when one regulatory agency makes changes, this often spreads to changes in guidance by other agencies. Also, ICAO is writing the specifications for new airport digital obstacle charts as part of their migration from paper AIP's to electronic data. I encourage you to get involved in one or more of these efforts if you want to help shape the future of our profession.

Share your thoughts with Roy at roy.maxwell@delta.com

Treasurer's Report (continued)

direct when paying by cash or check. Speaking of donations, we'd like to thank our 2011 Sponsors. Please visit their websites (links on page 1) and see what they're all about. We should support those who support us. ☺

As always, if there are any questions regarding the use of your dues, please don't hesitate to contact me at treasurer@sapoe.org.

ABOUT SAPOE

President - [Roy Maxwell](#)

Vice President - [Paul Giesman](#)

Treasurer - [Mike Byham](#)

Secretary - [Ravin Agarwal](#)

Webmaster - [Chad Gill](#)

Thank you for taking the time to read the SAPOE newsletter. I still hope to eventually publish quarterly, but we will depend on you, the members, for content in future editions.

We welcome all submissions for technical and industry news. This is the forum that will be read by your counterparts worldwide. Has your regulatory authority imposed a novel (worthy or otherwise) requirement on your operation? Tell us how you resolved it. Have you been facing an unusual operational challenge? Lend your peers your insight into how you not only conquered the technical aspects, but also how you brought other stakeholders (management, labor groups, regulators, etc.) into concurrence with your solution.

We also welcome non-technical articles. Have you been traveled somewhere that the members might find appealing? Write a travel article for us and include photos! Is there an air show or other unique event occurring in your region? Give your fellow SAPOE members the inside information to make the most of a visit to your area. While aviation-centric destinations are obvious, feel free to expand the memberships' knowledge of where else we might exercise our pass travel privileges!

More information can always be found on our website, sapoe.org.

Respectfully,

Craig Nordstrom - Newsletter Editor

editor@sapoe.org

The Development-OEI Paradox

Ken Scarborough is a Senior Project Manager for [Planning Technology, Inc.](#) and a true advocate for those of us who like departure paths free of man-made obstacles. Rumor has it that Ken's famous beer credits could be awarded to the first respondent that the FAA declares a "hazard determination" for payload impacts. Details at kens@plan-tech.com.

One Engine Inoperative (OEI) Performance – Can't live with it, can't live without it.

So goes the mantra at many urban airports where the development community wants to build higher and closer to the airport, yet also wants non-stop service to the next major city beyond where the airport currently serves. For those who may be reading this newsletter but are not intimately familiar with the FAA's dilemma, here is a quick review of the issue:

** FAA requires that for an aircraft to be certified to carry passengers, it must be able to climb at a certain rate and clear obstructions in the event of losing power to one engine during takeoff. The airspace that needs to be clear of obstructions for OEI operations is often well below the height of imaginary surfaces used to protect normal all-engines-operating arrivals and departures, especially for twin engine airplanes.*

** Airlines purchase certain engine types based on meeting the FAA's requirement based on the routes they intend to fly with those airplanes.*

** A developer proposes a building that penetrates the OEI airspace, but does not penetrate the all-engine terminal instrument procedures (TERPS) airspace.*

** Current regulations do not permit the FAA to determine the building a "Hazard" based on the OEI performance needs of the airlines.*

BUT THAT LAST POINT MIGHT BE CHANGING SOON! The FAA is considering an allowance for determinations based on penetrations to Airspace Composite Maps that are developed by the Airport and the surrounding communities. Many cities have already developed airspace surface-based maps and incorporated them into local zoning (such as MIA) or offer them to surrounding jurisdictions as a guidance document (such as BOS).

The problem is that answers provided to a developer by the FAA and the Airport regarding allowable building heights over a given parcel are often not the same height. The Airport's map will often take into consideration OEI corridors, where the FAA's programs only account for Part 77 and TERPS surfaces. The intent of incorporating Airport Composite Maps into the FAA's analysis software is to improve consistency and allow the FAA to make determinations based on the cumulative impacts to corridors of airspace that are critical to the "lift capacity" of the airport. This will allow more consistency between the critical heights provided to developers by the FAA and the Airports.

Providing clear direction to developers at the onset of their project has proven to reduce costs for all involved. Developers avoid the costs of multiple redesigns while the FAA, Airports and Airlines benefit through fewer meeting hours to educate and/or negotiate with developers on each individual project.

Avigation Easements for Engineers

Chad Gill is the SAPOE webmaster and constitution consultant, and also a member of the PBA. Not that PBA; he's a member of the [Pennsylvania Bar Association](#). In his spare time he earns a living as a senior performance engineer at United Airlines.

A prescriptive easement is defined in Black's Law Dictionary as "an interest in land owned by another person, consisting in the right to use or control the land, or an area above or below it, for a specific limited purpose... created from an open, adverse, and continuous use over a statutory period." When such an interest in land is threatened, an injunction, or "a court order commanding or preventing an action," may be obtained by the party whose interest in the land is threatened in order to extinguish the threat. The United States Supreme Court first recognized avigation easements in *United States v. Causby*, where the court held that "the flight of airplanes... is as much an appropriation of the use of the land as a more conventional entry upon it. We would not doubt that if the United States erected an elevated railway over respondents' land at the precise altitude where its planes now fly, there would be a partial taking, even though none of the supports of the structure rested on the land. The reason is that there would be an intrusion so immediate and direct as to subtract from the owner's full enjoyment of the property... the owner does... use it in somewhat the same sense that space left between buildings for the purpose of light and air is used. The superadjacent airspace at this low altitude is so close to the land that continuous invasions of it affect the use of the surface of the land itself. We think that the landowner, as an incident to his ownership, has a claim to it and that invasions of it are in the same category as invasions of the surface."

The recognition of the acquisition of avigation easements through prescription in American jurisprudence is an unsettled area of law. In *Institoris v. City of Los Angeles*, the California Court of Appeals recognized the existence of prescriptive avigation easements, stating that "Avigation easements are required only when the noise, vibration, fumes, fuel particles and inconvenience caused by low-flying aircraft interfere with the use and enjoyment of the underlying property to the extent it amounts to a taking." However, in *Institoris*, as it has in other California cases, the court accepted the existence of the prescriptive avigation easement as fact, without defining the means of its acquisition.

On the other end of the spectrum, in *Sticklen v. Kittle*, the Supreme Court of Appeals of West Virginia ruled that "an avigation easement in the airspace used by aircraft over lands adjacent to an airport cannot be acquired by prescription." In its decision, the court stated that "if such an easement were established, changes in the type and number of overflying aircraft could modify or cancel the easement. Moreover, other questions would arise such as whether more than one flight pattern over a particular tract of land would result in more than one prescriptive avigation easement, or by what manner could such an easement

CDL

This column is intended to carry miscellaneous information, corrections, and other items not quite suited for a full article. Thus, those non-standard items go here in the Configuration Deviation List. Please send your items to editor@sapoe.org.

The 2011 SAPOE Conference was only the second-most nerd-intensive meeting in Florida in October. North of Miami, in Orlando, the 100 Year Starship Conference was held with the goal of defining how to make long distance space travel practical, sponsored by the Defense Advanced Research Projects Agency (DARPA), the same people who brought us the internet. Did we possibly miss a chance to expand SAPOE's influence? LRC seems rather appropriate when measuring range in light years. More at 100yss.org.

One does not need to imagine very deeply to understand the tension that runs through the (virtual) office here at SAPOE Galactic Headquarters when the time for publication of the newsletter draws near. SAPOE President Roy Maxwell got the giggles from the following email thread as your mild-mannered editor, Craig Nordstrom, reminded contributor and SAPOE Vice President Paul Giesman of Boeing that his deadline was approaching.

TO: Newsletter contributors

SUBJECT: SAPOE Newsletter - gentle reminder

Craig: Just a reminder that I would appreciate receiving your articles by the end of October (of this year).

Paul: 2/3 done, I like the "this year" comment but unnecessary for me, I don't develop software.

Craig: Or carbon fiber airplanes...

Paul: Touche'

Paul's excellent article on some of his more memorable travels is on page 4.

Avigation Easements (continued)

be established if more than one tract of land were involved."

In conclusion, because of the unsettled nature of this area of law and the ever-growing need for our airlines to protect their airspace, domestic airlines may one day be required to apply the principles of obstacle accountability in proving, with precision, the elements needed in order to acquire an avigation easement through prescription.



No matter where you go, there you are

SAPOE Vice President Paul Giesman writes about two intriguing side-trips he made while traveling the world in support of Boeing Flight Operations Engineering.

One of the benefits of my job is I have been able to travel all over the world. I have been to every continent except Antarctica and by my last count I had visited 31 countries. A benefit this travel has allowed me is the chance to visit museums all over the world. I tend to target maritime and aviation museums as well as general history museums.

As an aviation organization it is appropriate to talk about the two aviation museums that I found particularly memorable. The first one is the [Imperial War Museum Duxford](#) just outside Cambridge, England. This museum is huge with 8 different display buildings and countless outdoor displays of all type of aircraft from the earliest history, WW I, WW II, the British civilian aviation airplanes and US military war birds. Many airplanes can be seen in different levels of restoration and if your timing is fortunate, you can see some of the birds fly.

The two things that became memorable to me were the American Air Museum and learning the story of the Manchester United Football Club and the tragic crash of the "Elizabethan" class [Airspeed Ambassador](#). At Duxford I found the historical [information and quote](#) I use in the beginning of the contaminated runway module I teach (note, back then you couldn't find information like this by an internet search. You had to go to museums and read books). This quote and the linked story describe the

infamous aviation crash concerning the Manchester United Football club and all the ramifications which came from this (pre-departure photo on page 1).

When you at the American Air Museum at Duxford you come nose to nose with a [B-52 bomber](#) with a [U-2](#) suspended above it. These two airplanes were a big deal to a kid like me who grew up during the Cold War era in the US and loved airplanes. This display is an excellent display of US war birds.

Speaking of the U-2, this leads me to the other aviation museum that I found fascinating, the Chinese Air Museum about 40 km north of Beijing. When you enter the museum you turn down a road that feels like the old runway of a MIG base. [Google map](#) shows the view of the museum today (zoom in to the A balloon), back in the early 90's when I was there it was limited to the lower area where you see the entrance road turn to the right and then hook back into a hill which was a hardened bunker that originally housed the MIG squadron.

The initial walk down the road had every variation of MIG 15/19 (above) that you can imagine. Many appeared to be experimental with changes in the aerodynamics and engine inlets. When you entered the bunker you saw on primarily ground support aircraft, low speed observation planes, older small fighters, helicopters and displays of flight suits, ejection seats and the like. What I found most

interesting though was a pile of rubble and parts on the ground which was labeled U-2 with Chinese writing giving the story. Unfortunately we did not have an interpreter. Years later after I finally looked up the story on the internet, it turns out the US secretly sold U2's to the Taiwanese Air Force who operated them over China sharing the intelligence with the US, it was one of these airplanes that had been shot down.

The top half of the page of this [web page](#) shows many of the displays I saw as they are currently displayed this includes an organized display of the U2 that I saw as a pile on the floor. As you continued on and came out of the bunker you strolled through a small area where all kinds of transports, bombers and surveillance airplanes were displayed (on the current map these airplanes are spread around the buildings to the top of the area on the [Google map](#) display. In this area there were two planes that jumped out to me, one was the Dakota that was Mao's airplane back in the day including the wicker sliding rocker that was Mao's special chair and a B-29 look alike (Russian TU-4) [AWACS airplane refitted with turbo prop engines](#).

I hope when you travel that you take the opportunity before you to get out and explore. You never know when or where a memory will be made, but you can be very sure it will not happen in the hotel room.