Roundup

DAC - MDC - Boeing Retirees **Ron Beeler- Editor** (562) 296-8958 of California

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Jim's Corner

Soon we will be heading into Fall. I hope you all had a good summer and did some traveling if that was in your plans. As for me, I stuck around the ol' homestead working on several projects. I plan to get out and about in the coming months.

We had many great compliments on the presentation by the March Luncheon speaker, Tim Buzza from Virgin Orbit (previously Virgin Galactic). Tim described what was happening in the world of new entrants in the field of low cost satellite launchers. We were able to coordinate a tour of Virgin Orbit's development and production facilities. The tour was attended by 27 Retiree Association members and guests. It was wonderful to see the enthusiasm and energy of the young workforce as well as many very innovative and advanced technologies being used. The initial development and test articles were in work as well as some pieces of the first production units. What was really heartwarming, was to see engineering, development and manufacturing returning to our old Long Beach property. As near as I can determine, the Virgin Orbit facility is located at the former east end of the parking lot opposite Building 12 just before the start of the West Ramp.

Our October event is fast approaching. A reservation card is included with this ROUNDUP. Our speaker is going to be Mark Page, a former MDC employee who has also worked for several other companies. It is expected that Mark will be presenting applications of the Blended Wing Body (BWB) concept, building on the theoretical possibilities of the BWB presentation by Bob Liebeck several luncheons ago. See Bill Rickard's, VP-Programs, article for additional info.

If you haven't yet taken advantage of the Boeing's "WATCH U.S. FLY" program I hope you will. It is focused on Boeing's desire to keep retirees more "in the loop" and also to help, where appropriate, through advocacy of subjects that are beneficial to The Boeing Company. You can sign up to receive updates and get involved on the website WatchUsFly.com.

Make sure to keep that 1st Tuesday in October (the 3rd) open so you might attend the Luncheon – always good to catch-up with our past work colleagues and friends.

Jim Phillips, President, DAC/MDC/Boeing Retirees

Luncheon Speaker for October

In our search for interesting speakers, we often come back to people and projects that made their mark at Douglas and MDC. Our speaker and subject for October fit that mold. We are all justifiably proud of the invention of the innovative Blended-Wing-Body (BWB) concept by Douglas engineers some years ago. The BWB offers a breakthrough in aerodynamic and structural efficiency that's unprecedented in the modern era. We had Bob Liebeck as a speaker to tell us about the history of that project, its potential to change the nature of large transport aircraft, and its inability to get there, in spite of extensive BWB research over the past 20 years. It has generally been accepted that BWB worked best for large seating capacity airplanes, and poorly for the lower capacities of single aisle airplanes. BWB has also done well for aircraft with no capacity for passengers or cargo – Unmanned Arial Vehicles, UAVs. Our speaker, Mark Page, and his company, DZYNE Technologies, have attacked that limitation and developed an enabling technology for single-deck BWBs. This allows the BWB to break today's 200 passenger lower limit, and access the Regional and Single-Aisle markets which account for over 75% of the world Jetliner fleet. The surprising enabler is a new type of landing gear that allows the high-lift system to be virtually eliminated in addition to enabling an uncompromised single-deck layout that can be stretched into the 200- passenger realm.

This presentation will describe the genesis of the concept and its potential to disrupt the BizJet and Single-Aisle markets.

Mark is one of us, an aeronautical engineer who graduated from U of Illinois in 1979 and headed straight for Long Beach and Douglas. He earned his stripes on some of the most noteworthy projects of that time, the HSCT, the Propfan, the BWB (of which he was co-inventor) and the MD-90.

At some point, Mark got an itch to apply all the great aerodynamic knowledge and tools he had developed to race cars, and went to work for Dan Gurney's AllAmerican Racers as Chief Aerodynamic Designer for their series of Champ Cars.

As Gurney scaled back the business, Mark made the jump to Swift Engineering where he was Chief Scientist and expanded his portfolio from Champ Cars to Formula One, NASCAR, and CART. In this business, emphasis was a bit more on drag and a bit less on lift, and the speed regime was different, so Mark had to modify his tools and techniques to work well.

He gradually got Swift to invest in developing a line of UAVs, culminating in the Killer Bee.

He also led a team that developed the Eclipse Concept Jet in a project that lasted 200 days and culminated in the prototype flying into *EAA-Airventure* to great fanfare. Swift sold the Killer Bee to Northrop for a profit, but felt this business had too much financial risk, so Mark fulfilled a life-long ambition and started his own business with some associates. Dzyne Technologies, based in Irvine and the Beltway, has been successful from day 1, growing from a core of 5 to a total of nearly 70 people today.

He has led the design of a number of traditional and wacky air vehicles at Dzyne, including the Mooney M-10, the Rotor Wing, and a UAV that turns to dust at the end of its mission. You will need to attend the luncheon to get an explanation of the latter 2 of those 3, as I cannot do them justice. See you in October.

Bill Rickard VP-Programs

AIRPLANE SMOKE TRAILS & CONTRAILS ©

by Dan Pemble, McDonnell Douglas/Boeing Field Service Representative (retired: September 2009)

Having worked in commercial and US Naval aviation collectively for almost 44 years, I can say for sure that, since their inception, jet engines have very definitely contributed to global pollution! Every airplane flying at one time created visible smoke trails, like those seen in the following photos. These smoke trails were created by unburned products from the fuel (or the combustion process itself) and included carbon debris, sulfur, and nitrous oxides (NOx). Over the years, each successive generation of jet engines has become more and more efficient with exhausts producing less and less harmful emissions and, today's high-tech engines rarely emit any visible smoke at all.

When speaking of each successive generation of new jet airplane engines being more efficient, it is in terms of Specific Fuel Consumption
(SFC). Obviously, the amount of harmful emissions spewed out by a jet engine is directly proportional to the engine's SFC; thus, when the SFC is reduced, so too, are the emissions. Regarding sulfur content, different grades of petroleum have varying levels of

sulfur content. A promising new technology related to reducing harmful emissions from jet engines is "lean blowout detection & avoidance"; such technology, when available on future-generation jet engine's, will entail sampling of the engine's exhaust and making real-time adjustments to the engine's electronic engine controller (EEC) to the extent possible to minimize "raw" harmful emissions due to rich fuel mixtures (while at the same time not restricting engine thrust levels required for the current flight regime). All modern-day commercial airliners have EEC's that utilize a multitude of inputs to determine the most efficient engine operations and then effect the appropriate engine control during all flight conditions. Of course, with the help of science, technological advances in jet engine design to make them more and more efficient and environmentally friendlier will continue for many more years to come.

Regardless of the current state of jet engine technology, at whatever point on earth that air samples may be taken, the samples will contain various types of chemical pollutants. However, this is not to say that all the pollutants are from jet engines. In fact, even before jet engines have become more and more efficient, atmospheric pollutants were likely most predominantly from all other sources on the planet such as from cars, trucks, buses, boats, factories, and all other sources that use fossil fuels.

At numerous locations throughout the world, we often see varying concentrations of "streaks" in the sky from jet airplanes heading in all directions. Depending on upper atmospheric conditions, sometimes these streaks merge together and remain visible for extended periods. The following photo shows a very high concentration of these streaks, as often is commonly seen, in the vicinity of some of the world's heaviest-travelled air corridors. These streaks are known as "contrails".

The following passages about contrails are as directly quoted from a Wikipedia web site: https://en.wikipedia.org/wiki/Contrail. Contrails (short for "condensation trails") or vapor trails are line-shaped clouds sometimes produced by airplane engine exhaust, typically at aircraft cruise altitudes several miles above the earth's surface. Contrails are composed primarily of water, in the form of ice crystals. The combination of water vapor in airplane engine exhaust and the low ambient temperatures that often exists at these high altitudes allows the formation of the trails. Impurities in the jet exhaust from the fuel, including sulfur compounds (0.05% by weight in jet fuel) provide some of the particles that can serve as sites for water droplet growth in the exhaust and, if water drop-lets form, they might freeze to form ice particles that compose a contrail. Their formation can also be triggered by changes in air pressure in wingtip vortices or in the air over the entire wing surface. (Dan Pemble note: Vortices may also occur at other areas of the fuselage.)

Depending on the temperature and humidity at the altitude the contrails form, they may be visible for only a few seconds or minutes, or may persist for hours and spread to be several miles wide, eventually resembling natural cirrus or altocumulus clouds. Persistent contrails are of particular interest to scientists because they increase the cloudiness of the atmosphere. The resulting cloud forms may resemble cirrus, cirrocumulus, or cirrostratus, and are sometimes called cirrus aviaticus. Persistent spreading contrails are thought by some, without overwhelming scientific proof, to have a significant effect on global climate. (Dan Pemble note: "Certainly contrails that occlude the sun will impact immediate-area surface temperatures!) Contrails are sometimes called "chemtrails" in reference to the conspiracy theory regarding the undisclosed spraying of chemical or biological agents by various high-flying airplanes." Unquote.

Please have a look at the noted Wikipedia web site for additional contrail-related information.

Dear Colleagues,
For more than 100 years, The Boeing Company and its employees have made significant contributions both here in the United States and across the globe. At Boeing, we do amazing things in the skies, in space, and now even in the seas, but we also do inspiring things here on the ground – in the communities where we live and work.

Boeing and its employees have long recognized the value in giving. Last year, we gave nearly $170 million and donated hundreds of thousands of hours to volunteer service. Whether it's supporting our nation's veterans, inspiring today's youth through engaging STEAM education programs, assisting our neighbors who are affected by natural disasters, bringing cultural and educational opportunities to underserved populations, or our commitment to environmental programs, Boeing and its employees are united in a collective effort to drive powerful, lasting change.

Today, I want to highlight another opportunity for employees to once again become agents of change in our communities. This year, Boeing has partnered with the American Cancer Society (ACS) to help end cancer. With one in two men and one in three women being diagnosed with cancer in their lifetimes, nearly all of us in communities across the globe have been impacted by this terrible disease. But there is good news. Advances in treatment and research – made possible by organizations like ACS – are helping more and more people fight back, improving outcomes and making it possible for survivors to lead happier, healthier and more fulfilling lives.
To build on this momentum and to help raise the money needed to fund additional research, education programs, advocacy efforts and patient services nationwide, Boeing has committed its support in 2017. We are embracing the theme – **Discover Your Power** – which challenges each of us to share our story and reminds us that by uniting in the battle against cancer, we have the power to make a difference.

I encourage each of you to visit our **Boeing-ACS website** and donate, share your story via our social media campaign hashtag #BoeingAgainstCancer, and become part of the next big breakthrough in the fight against cancer.

While donating is strictly voluntary, increasing our impact will only be possible with the support and generosity of employees like you.

Boeing will match all contributions made to ACS using the Boeing-ACS website, and it will not be counted towards your annual Gift Match Program allocation.

I hope you will join me in this very worthy cause.
Thank you,
John Blazy
Vice President Global Corporate Citizenship

From Barbara's Membership Desk

WELCOME NEW MEMBERS

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C1, Flight Control & Data Center / A3, Delta IT

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Jim Michel,
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Thomas P. Posten, C1, MP&E

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