



Aeronautical Society of South Africa

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A Division of the Royal Aeronautical Society

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EDITORIAL

Once again the Aerospace Defence sector is mired in controversy following the announcement that the government has cancelled the contract for the purchase of eight A400M transport aircraft. Although this announcement was made, there is little information surrounding the fallout and the effects of this within the SA industry that is very much involved in the development of the A400. Time will tell what will happen, and for sure everybody involved in some way in A400 activities will be anxious.

At least there is also some good news, and that after an 18 month delay, the first A400M prototype took to the skies in early December 2009, and since this first flight have been able to conclude more successful test flights. One hopes that after this and solving many of its technical problems, progress will be made towards production.

Even with this belated success in achieving the flight phase, Airbus will have its work cut out to garner support by the current European Partners and initial customers. This in particular to assess how to absorb the additional costs and the delay in introducing the System into military duties where most of the affected Air-forces have had to introduce either current system life extension programmes or contract airlift to commercial or charter operators. The SAAF in the meanwhile will need to also re-assess its airlift requirements to meet it's commitments in future if South Africa is to remain the African continent's leading supplier of peacekeeping forces.



The Aeronautical Society Indoor Model Aviation Challenge

John Monk

It was decided in 2008 that the Society organize an aeronautical event as a challenge to its members and other aeronautical enthusiasts to participate in which after some careful thought resulted in a challenge involving model aircraft. The event was intended as a fun competition to encourage interest in both aviation and aeronautics amongst learners and students although there was no age limit. It took place in the 28 Squadron hangar at Waterkloof Air Force Base on the 18th September 2009.

The competition was split into two parts, free flight glider competition and an indoor radio controlled model aircraft competition. Both competitions had two prime objectives, and that was to demonstrate designs that could operate at two extremes of the flight envelope. For the gliders it was to demonstrate flight distance and also endurance, thus the combination of flying the furthest and also the longest would win the day. Similarly the radio control models had to demonstrate the fastest possible flight over a racecourse pattern and then do the same as slow as possible, all with no airframe changes being allowed other than trim.

A total of nineteen gliders and twenty radio controlled models arrived on the day. Some flew very successfully, some not. Happily there were four teams from the Waterkloof Hoerskool with learners from as young as grade 8 that competed in both classes under the guidance of a passionate teacher. The other invited schools didn't manage to put any teams together some quoting the closeness of the event to their exam period as an excuse.

The event started on time with many of the teams arriving earlier to practice. The allocated time was insufficient primarily due to there being so many contestants, but at least everybody eventually had an opportunity to fly. Prizes were awarded in eight different categories in the glider competition and nine in the radio controlled model competition.



The Glider Teams

The overall winners in the glider competition were from Denel Saab, followed by Matt Hirst of Frasers hobbies and third the CSIR B team. The radio controlled model winners were Matt Hirst, followed by the Wits team "Useless" and the UP team "AFBA" third.

Overall the competition went off very successfully with close on 90 people attending either as competitors or as spectators. From a safety viewpoint some spectators were hit by the gliders but not by the radio controlled aircraft. No injuries were reported due to the low flying mass but this is something that should be taken into account at the next venue.

Thanks to Rob Hurlin for both his assistance in running the event as well as that of his learners who took the administrative load off the CSIR helpers that were brought along. Thanks also to Rob Jonkers for his help throughout the event and for handling the prize giving. Esther as always assisted with the certificates, prizes and catering.

Col. Chris Oosthuizen of the SAAF Siyandiza programme is also to be thanked for arranging the hangar for the competition.

While the organisational aspects were quite onerous and there were some last minute hiccups not the least being the entries spreadsheet, the competition appeared to be a success in what it set out to do. I would recommend that, if repeated, the event should be held earlier in the next year.

I will put together a "lessons learnt" paper for whoever organises the next event if the council intends hosting one again



The Electric Power Radio Control Teams

Aeronautical Society of South Africa (AeSSA) acknowledges International Award winning teen.

The Aeronautical Society of South Africa acknowledges the outstanding success achieved by a Pretoria girl at an American Science and Engineering Fair with her "Propeller Efficiency" Project. For this event, the Society was represented by the some of their council members.



From Left to Right: Maj Gen (Rtd) Des Barker, Colin Butler, Dr. Rob Hurlin, Sune Gerber, Rob Jonkers, Gary Corderly, Maj Gen (Rtd) Thack Thackwray

Sune Gerber of Waterkloof High School, Pretoria, was elected to represent South Africa at the International Sustainable Energy, Engineering and Environmental World Project Olympiad (I-Sweep 2009) held in the American city of Houston, Texas recently.

Sune's journey to the US started last October, when she was awarded a gold medal in the Senior Engineering category of the National Eskom's Expo for Young Scientists in October last year. Sune chose this project as she realised that the need for aeronautical and mechanical engineers' to develop more fuel efficient and environmental friendly airplanes will ultimately result in reinventing the propeller and reviewing previous designs. She built a test rig with a balance mechanism and then tested various home-made propellers with a given input power from an electric motor from which thrust could be measured in a variable free stream flow (homemade wind tunnel).

Sune, then a Grade 10 learner walked away with FOUR prizes at this national competition. Apart from winning a gold medal, she also received the prestigious Best Young Scientist Female award, the Aeronautical Society of South Africa Award, the Wits University Mechanical Engineering prize and was awarded a bursary to study in the fields of Engineering, IT or Finance at any South African institution of higher learning of her choice. During this event the Society presented her with a society cheque as a winning prize and a medallion. These awards resulted in an nomination to the international Youth Science where Sune won a Gold Medal in the Senior Engineering Category for which she received US\$ 1 000 in prize money. She was also awarded the American Crocker & Reynolds Construction, L.P special award for "Recycle, Reuse and Renew" for her motivation and approach that the aviation industry needs to take a look backwards at Propeller driven aircraft as a way to save fuel, taking into account environmental and economical realities.

After completing school, Sune intends to study aeronautical engineering and pursue a career flying. She hopes to encourage other youngsters to become more interested in science. The Society congratulated her on her excellent performance in and is looking forward to follow her progress within the aviation industry.

International Aerospace Symposium of South Africa - IASSA 2009

UAV Demo Day

Rob Jonkers

As part of the the proceedings of IASSA 2009 the Organising Committee with suggestions from the DST held a UAV demonstration and exhibition at Swartkop AFB on Sunday 23 November 2009 with the objective to be able to show off hardware and related UAV projects that are ongoing within the SA context. It was primarily aimed at institutions such as Universities and other organisations involved in R&D to display and potentially demonstrate flight. The event was arranged with the necessary SAAF approvals under the auspices of a model flight event.



There were around 200 visitors to the event and with the kind sponsorship of the SA industry the organisers could set up a marquee tent with refreshments and to host the exhibitors. The exhibitors were the CSIR who brought a range of their current projects with 2 flightworthy demonstrators, ATE who brought their Kiwit System and the University of Johannesburg who brought 3 systems.



The UJ systems were interesting in a sense as their perspective was not about developing aircraft but rather developing alternative energy options to power aircraft. One of their projects involves a solar powered high performance glider where their current objective is to break the world record of autonomous flight using electrical energy of 100 hours. (Quite a challenge if one has to plan to fly half

the period through the night hours). Their other project has an electrical power plant which is driven by a hydrogen fuel cell currently installed in a 5th scale Piper Cub. Although a heavy installation as an initial prototype, it flies and can only improve going forward.

The two CSIR UAVs that flew were the Indiza, a T tail pusher configured aircraft and the Modular UAV. Both these systems have autopilots on board and have autonomous flight modes programmed into their on board navigation system which can be controlled from a ground station.



The first to fly was Indiza, which was piloted by John Monk during the launch and recovery flight phases. The aircraft was switched over to autonomous flight once in a stable configuration, but it appeared the autopilot's gain settings were somewhat out of kilt and John had to cut in as the safety pilot.

Thereafter it was the turn of the modular UAV which is a big system and it also had on board a stabilised camera in its payload bay. After a difficult take-off, each of the auto



flight mode channels were activated, first yaw, then roll and then pitch/power where it could be shown that the aircraft was following its pre-planned navigation course and kept to its planned height above ground, and with the undulations of Swartkops, one could clearly see the ascents and descents as the aircraft was doing terrain following. John then took control to land the aircraft uneventfully.

As an event as part of the Symposium it was for sure a success, and with future Symposia it is envisaged to do this sort of demonstration and exhibition again.



International Aerospace Symposium of South Africa - IASSA 2009

Rob Jonkers

This Internationally branded and Nationally Integrated Symposium is the culmination of many combined efforts of Aerospace stakeholders in the country, and is the third such Symposium in the format as originally envisaged by the Department of Science and Technology two years ago, and is starting to mature as a true Aerospace Symposium. What has been done principally in the last year was to combine the resources throughout the country



to achieve a single Symposium / Conference covering a broad spectrum of Aeronautical subject matter. The overall theme for this year's was dubbed as **Aerospace Technology: Enhancing our Partnerships**, this theme intended to show everybody's commitment to integrate Aerospace activities in the Country.

The Symposium as a strategy is now being branded as IASSA, with the objective of ensuring yearly continuity and that it become a well known annual event and to establish it in the class of conferences such as for example ICAS (International Council for the Aeronautical Sciences). It is planned for the following years to start introducing peer reviewed papers as part of the process of selection of technical papers, as currently engineers, scientists, technologists involved in Aerospace in South Africa do not have the opportunities to publish their work other than within their own environments or by submission to other International Symposia. This progression has the potential to re-establish South African based Aerospace Journals as well as providing a platform to have more success in publishing Internationally which can result in collaborative work opportunities with International Institutions.

The organisers trust that the Symposium has so far lived up to everybody's expectations in terms of the selection of subject matter and the quality thereof, and gauging by the number of delegates of over 250 it appears that there is significant interest and shows vibrance to our small Aerospace community. As a footnote, the



organisers expected less than 200 delegates initially, but as it would happen the numbers increased dramatically in the last week.

The Minister of Science and Technology Hon Naledi Pandor was on hand to provide a very insightful opening speech covering various R&D subjects and notably being happy with International participation and integration of European 7th Framework Projects.

For a full rendition of her speech, visit <http://www.dst.gov.za/address-by-minister-naledi-pandor-mp-at-the-international-aerospace-symposium-of-south-africa>

As we need to develop our young cadres in the field of Aerospace and related subjects, a key feature of this Symposium was to provide opportunities for students to partake in the Symposium as delegates as well as speakers to provide them with the necessary experience in presenting their subjects in front of audiences, very valuable for their future engagement in the real world. The last day of the Symposium was primarily set aside for their presentations, and going by the interest from the audience and the depth of the subject matter a very successful outcome.



Pictured with Hon Minister Pandor are all the Students who took part in the Symposium

The intention is to hold this event alternating between various locations in the country to allow participation and organisation to be done in other areas where there are Aerospace centres of activity. For now the host venues will be Gauteng & the Western Cape, thus for 2010 the Symposium will be held in the Cape region, the planning of which has already started.



South African World War 2 Hero Honoured

Keith King

Reading the obituary of a pilot who fought in WW2 is becoming a very infrequent occurrence, which is hardly surprising when one considers that the war ended 64 years ago. It is also not very common to read of the exploits of a South African fighter pilot who flew with the allied forces. The name "Sailor" Malan is the one that first springs to mind when thinking of famous South African fighter pilots but there must be many more less well known names and one of



them is Colonel "Rosy" du Toit whose illustrious career was published in an obituary in the English newspaper The Telegraph a few months ago. He died earlier this year at the age of 90 and is described as "one of South Africa's outstanding wartime fighter pilots and leaders".

He was commissioned into the South African Air Force on September 6th 1939, the day South Africa declared war on Germany and flew a Hartbeest biplane of 41 Squadron on coastal patrols and later in support of South African ground forces during the little known campaigns against Italy's East African Empire. After many daring exploits including picking up a fellow pilot from behind enemy lines, several forced, emergency and crash-landings he was "mentioned in despatches".

In July 1942 he joined No.4 (SAAF) Squadron flying the Kittyhawk fighter bomber and was promoted to Major to command the squadron. After many successful sorties he



was awarded a DFC and in October 1943 was appointed deputy leader of No.7 (SAAF) Wing, commanding 3 squadrons of RAF and SAAF Spitfires in support of Montgomery's Eighth Army. After an audacious attack on a landing ground in Yugoslavia resulting in the destruction of 4 aircraft, damage to more and the elimination of gun positions he was awarded an immediate Bar to his DFC. In July 1944, at the age of 26, he was promoted to Colonel and took command of No. 8 (SAAF) Wing, with 4 Spitfire squadrons. His record of "gallant leadership, great skill and courage", for which the Bar to his DFC was awarded, continued until the end of the war when he was awarded an American DFC and appointed CBE, a rare distinction for such a young officer.

FORTHCOMING EVENTS

The Council is hard at work on a programme of lectures and visits that promise to be both entertaining and informative for the coming year. Although no dates are set or confirmed we intend to cover amongst others topics such as Maintenance of Large Airliners, Gripen Flight Testing, Rooivalk qualification. Watch your email & web site for further information.

