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SYDNEY BRANCH

**MAY 2017**

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PO Box 573, Mascot, NSW 2020

Web: [www.raes.org.au](http://www.raes.org.au)

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**NEWSLETTER**



**Warwick Holmes**

**Executive Director of Space Engineering  
The University of Sydney, School of  
Aerospace Mechanical and Mechatronic  
Engineering.**

discussing

**'The European Space Agency Rosetta  
Mission and Lessons for the  
Australian Space context'**

Date: **Wednesday 3<sup>rd</sup> May, 2017**

Time: **18:00 for 18:30 hours**

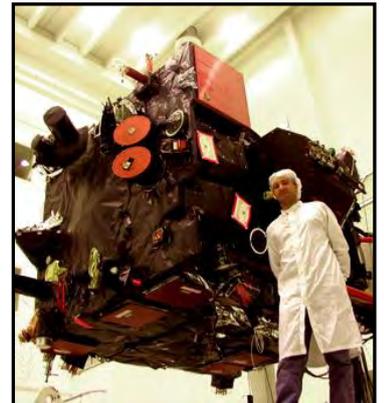
Venue: **Mech Eng Theatre, Mech Eng Building, University of Sydney**

Light refreshments will be available prior to the commencement of the meeting Attendance will attract 1.5 CPD hour

**Profile:** Warwick Holmes was born in Sydney and lived his junior years in Adelaide and Canberra. He graduated from Sydney University with Bachelor of Science and Bachelor of Electrical Engineering degrees and a Masters degree in Technology Management from the University of NSW. For 29 years Warwick worked in Europe exclusively on the development of European Space Agency (ESA) spacecraft including: Scientific, Earth Observation, Telecommunications, Navigation and Manned spacecraft programs. He specializes in spacecraft system engineering, focusing on the verification of hardware and software of complex spacecraft systems.

Warwick was employed as a staff member of the European Space Agency the only Australian to have achieved this position. Working as an avionics system engineer, Warwick worked on seven ESA programs each valued at over A\$1 billion. He successfully built, tested and launched ten different spacecraft with ESA with a total mass operating successfully in orbit of over 37 tons.

Warwick was a payload engineer for five launch campaigns from the ESA launch base in French Guiana using the Ariane-3, Ariane-4, Ariane-5 and Soyuz-STB launch vehicles. On the Rosetta project, he was designated the Spacecraft Support Team leader (SST) responsible for giving the final "Go-for-Launch" call from to the Flight Operations Director in Germany, starting the Rosetta mission.



Building Rosetta spacecraft 2002



Testing Philae lander now on Comet-67P

**Synopsis:** The Rosetta spacecraft orbited the Sun five times and travelled through the solar system for more than 8 billion km over a period of more than 12 years to complete its mission. Rosetta achieved historical world acclaim as the only interplanetary spacecraft that successfully landed a probe (Philae) and orbited a comet for more than 2 years performing >100,000 scientific measurements.

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**RSVP:** Whilst attendance is free - registration for the evening **is required**. Please register by clicking on/copying and pasting into your URL this link: <http://raesmay17.eventbrite.com.au> Your registration will be confirmed by email with an attached ticket. **Please print the ticket and present the ticket at the door. Please note:** Non members should enter the code **NM** if requested to enter a RAeS membership number. Any member who does not have access to the internet can send a letter to Mr Jeff Lock, 4 Hillcrest Place, North Manly NSW 2100 with your name (plus names of accompanying persons), membership number or state 'Friend' if you are a Friend of the Branch, and phone number.

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**Light supper:** *Following Warwick's presentation a light supper (pizzas) will be provided to give the speaker and attendees the opportunity to network, mingle, and to continue discussions.*

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**Parking:** is available in the Shepherd Street multi-story car park, located on the corner of Cleveland St and Shepherd St. The rate is \$2 per hour (up to \$6 maximum), but note that only gold coins are accepted in some machines. Parking is also available in University of Sydney On-Campus Parking for \$2 per hour (up to \$6 maximum). Additionally, free parking is available in surrounding streets. Please observe parking restrictions and allow time to drive to the University of Sydney, park, and walk to the venue.

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**Public Transport:** The closest train station is Redfern station, which is a 10 minute walk away from the venue. From Railway Square near central station any 42X bus (e.g. 422, 426...) and the M30 will take you to the University of Sydney (on City Road). Please allow time to travel by public transport, including waiting time, and time to walk to the venue.

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### **Australian Aviation Pioneering Spirit Alive in the F-35**

On Wednesday, 8 March 2017, Australia's first two Lockheed Martin F-35 Lightning II multi-role fighters departed from Brisbane bound for the USA to continue their involvement in training the next generation of pilots from the Royal Australian Air Force (RAAF) and international partner nations. The RAAF F-35s were in Australia for the Avalon Airshow to give the Australian public its first look at the 5<sup>th</sup> Generation air combat aircraft that will soon be at the front line of the country's defence capability.

The trans-Pacific flight of the two RAAF F-35 aircraft to Australia marked several firsts, including the first time the Lightning II has operated in the southern hemisphere. Under the command of Squadron Leaders Andrew Jackson and David Bell – Australia's first qualified F-35 pilots – the two RAAF F-35s transited a distance of more than 16,000 kilometres (8,000 nautical miles) from their current home at Luke Air Force Base outside of Phoenix, Arizona, to RAAF Base Amberley in Brisbane. The return flight



of the F-35s to the USA also has great historical significance, replicating the 1934 flight of Australian aviation pioneer Sir Charles Kingsford Smith, who flew his single engine Lockheed Model 8D Altair aircraft, named *Lady Southern Cross*, on the first ever west-to-east aerial crossing of the Pacific Ocean.

The F-35, with its array of on-board sensors, supersonic performance, and designed-in stealth technology represents a formidable advance in aviation capability beyond the wildest dreams of Kingsford Smith. One notable coincidence, though, is that both the Lockheed Altair and F-35 are powered by Pratt and Whitney engines.

However, the F135 engine on the F-35A generates more than 100 times the power of the Altair's Wasp nine cylinder radial piston engine. The F-35 transit from Australia to the USA was completed in less than three days and a total flying time of approximately 20 hours. The F-35s were refueled in-flight by RAAF KC-30 tanker crews and made overnight stops at Andersen Air Force Base on Guam and Hickam Air Force Base, Honolulu, Hawaii, before completing the transit to Luke AFB, Arizona, on March 10. In comparison with the smooth transit for the F-35s, the trans-Pacific crossing by the Lockheed Altair *Lady Southern Cross* was significantly more arduous. The Altair was a wooden monoplane less than 9 meters (28 feet) in length weighing 1500kg (3,300lbs) with a top speed of 360 kph (180 knots) – about half the length, one-tenth of the weight and one-sixth of the top speed of an F-35. It featured a variable pitch propeller and hand-retractable undercarriage that were considered 'state-of-the-art' in the early 1930s.

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The journey of the Lady Southern Cross, illustrated by the red dotted line, is compared in this graphic to the journey of the F-35, illustrated by the purple line. The F-35's total flight time was ~20 hours, at a maximum altitude of greater than 30,000 feet, and an average speed of 450 knots. By comparison, the Lady Southern Cross's flight time was 52 hours, with an altitude of no more than 15,000 feet and an average speed of 150 knots.

Departing Archerfield Aerodrome in Brisbane on 21 Oct 1934, Kingsford Smith and his navigator, (later Sir Gordon) Taylor flew the *Lady Southern Cross* to Fiji, where they landed on Suva's Albert Park rugby field.

The aircraft was then flown 20 km (14 miles) to Nasilai Beach on 24 October to give it sufficient 'runway' for a fully fueled takeoff. As Kingsford Smith was attempting to take off from the narrow curved beach, a crosswind and rising tide forced the *Lady Southern Cross* into the surf, requiring all of Kingsford Smith's skill to avoid catastrophe. After a further five days in Fiji awaiting favourable weather conditions, the *Lady Southern Cross* made the flight of more than 20 hours to Wheeler Field in Hawaii on 29 October. Once again, Kingsford Smith was able to avert disaster when the aircraft entered a spin and dropped more than 9,000 feet (2800 meters) while flying

through a heavy tropical storm. Following repairs and recuperation in Hawaii, Kingsford Smith, Taylor and the *Lady Southern Cross* completed an incident-free flight from Wheeler field to Oakland, California, on 4 November 1934 – a total of 52 hours flying time over 15 days from Australia to the USA.

Upon arrival they were welcomed by an estimated crowd of 20,000 people. In his post-arrival speech, Kingsford Smith predicted that his achievement would pave the way for inter-continental flight to one day become a routine experience for the general public.

Getting back to the present day, the two RAAF F-35s involved in the trans-Pacific flight were delivered to Luke Air Force Base in 2014 and will remain in the US until 2020 as part of the RAAF commitment to international pilot training arrangements at Luke. The first permanent arrival of RAAF F-35s in Australia will occur in late 2018, with all 72 aircraft being delivered by 2023.

Inter-continental flights by RAAF F-35s will be a regular occurrence in the decades to come, with a regular tempo of joint exercises in North America and the Asia-Pacific. Australia will also routinely host deployments and exercises involving the F-35s of close allies including the United States.

The F-35 is a worthy inheritor of Kingsford Smith's legacy and continues the more than 80 year ties between Lockheed Martin aircraft, Pratt & Whitney engines, and aviation in Australia.

**Membership Information:** To join the RAeS or to UPGRADE your current membership standing or to see membership GRADE INFORMATION go to [www.raes.org.au](http://www.raes.org.au) or email [austdivision@raes.org.au](mailto:austdivision@raes.org.au). Annual memberships commence at only \$142 or \$28 for Students. Being a member helps us sustain a vibrant activities programme and opens the way to access restricted 'member-only' events.

**2017 Diary: May 5-7:** Aviatex 2017 is the first of what is to become an annual aviation trade show aimed primarily at the light sport, recreational and general aviation markets. Aviatex 2017 will be held in conjunction with **Wings over Illawarra 2017**, which is fast becoming a premier event on the Aviation enthusiast's calendar. Aviatex will provide the trade component to Wings over Illawarra and will offer a fantastic opportunity for businesses to showcase their products and services to a wide audience. Refer details: <http://www.aviatex.com.au/>



**May 8-11:** The Association for Unmanned Vehicle Systems International will hold XPONENTIAL 2017 in Dallas, Texas, USA. Attendance will equip you with insights, solutions and opportunities for the industry's newest developments and challenges. Attend more than 200 timely and relevant courses—organized into three tracks (policy, technology and business solutions), keynotes from industry

pioneers and a robust show floor showcasing the latest innovations. Refer details: <http://www.xponential.org/xponential2017/public/Enter.aspx>

**July 19-21:** 2017 Aircraft Airworthiness and Sustainment (Australia) Conference, a non-profit event for the benefit of all those involved in sustaining our fleets, both **Civil and Military**, safely and economically through their lifecycle. The Conference will be held at the Brisbane Convention and Exhibition Centre. Call for papers announced with abstracts containing no more than 300 words to be received for review by 14 April 2017. **Delegate and Exhibitor Registration is open now.** Refer details: <http://www.ageingaircraft.com.au/aasc>

**Aug 14-29:** 'Total Solar Eclipse Tour' Including visits to famous USA Astronomical and Aerospace Facilities. For further details please contact The Sutherland Astronomical Society Inc. Email: [info@sasi.net.au](mailto:info@sasi.net.au)

**Sept 25-29, 2017:** The 68<sup>th</sup> International Astronautical Congress – *Unlocking imagination, fostering innovation and strengthening security*-- is being held in Adelaide. Thousands of scientists, including some 200 astronauts, will participate in the international space congress. The global economy and security of many nations depends on assured and secure access to satellites that provide communications, timing and navigation services and remote sensing data. Refer details at: [iac2017.org/](http://iac2017.org/)

**Nov 14-16:** 5<sup>th</sup> International Conference on Aerospace Science & Engineering (ICASE). Refer details: [www.ist.edu.pk/icase](http://www.ist.edu.pk/icase)



### Aerospace Websites

[www.57rescuecanada.com](http://www.57rescuecanada.com) : Follow Capt. Karl Kjarsgaard's adventures to recover Halifax bomber LW170 which is resting beneath 5000ft of water off the Irish coast;

[www.adastron.com/707/updates/updates.htm](http://www.adastron.com/707/updates/updates.htm) : Diary of Boeing 707-138B XBA formally Qantas EBA.

[www.airshow.com.au](http://www.airshow.com.au) [www.atsb.gov.au](http://www.atsb.gov.au) [www.aviationmuseum.com.au](http://www.aviationmuseum.com.au) - Temora Aviation Museum;

<http://boxkite2014.org/book/book.htm> : The Boxkite project.

[https://en.wikipedia.org/wiki/Rolls-Royce\\_Trent](https://en.wikipedia.org/wiki/Rolls-Royce_Trent)

<http://hars.org.au/> Historical Aircraft Restoration Society

<https://herox.com/SpacePoop> The Space Poop Challenge

[www.powerhousemuseum.com/whatson](http://www.powerhousemuseum.com/whatson) ;

<https://qfom.com.au/> Qantas Founders Museum, Longreach, Queensland

[www.singapore.com.sg](http://www.singapore.com.sg)

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**NEWSLETTER**



**John Ehret**  
**Manager**  
**Ground Safety & Environment**  
**Qantas Group Shared Services**  
**Workplace Health & Safety**

discussing

**'Aircraft Cabin Fume  
Detection & Assessment –  
Isolating Emission Sources'**

Date: **Wednesday 31<sup>st</sup> May, 2017**

Time: **18:00 for 18:30 hours**

Venue: **Mech Eng Theatre, Mech Eng Building, University of Sydney**

Light refreshments will be available prior to the commencement of the meeting Attendance will attract 1.5 CPD hour

**Profile:** John was born in Sydney and has a Masters in Applied Science (OHS) from the UNSW. He is married with 3 grown children and a passion for Vincent motorcycles.

John commenced his career in 1979 working as a Laboratory Technician for the Unilever Group of companies working mainly with emulsion polymers and thermoplastic adhesives. Over the years he moved into the roles of Production Chemist and Technical Services Chemist. He was then offered an opportunity in the area of Workplace Health and Safety. Johns' final position in the chemical industry was the role of Health Safety & Regulatory Affairs Manager with National Starch and Chemical Pty Ltd, part of the ICI Plc Group of companies.

John then opened his own small consultancy, Safety and Environmental Consulting services between 2000 and late 2001 focussed on services to the environmental remediation of contaminated sites.

In late 2001 he was successful in gaining the role of OHS Manager for Qantas Freight. In 2005 he worked with Cabin Services for approximately 9 months before moving to Qantas Engineering as Manager Ground Safety & Environment where he spent the next 10 years. During this time John noted that there were often extensive periods of Ground Time associated with fumes and odours which could be described as mild, transient and often troublesome to isolate using traditional methods. Given his background in Industrial Hygiene, he looked to apply his knowledge of air quality to the task of isolating fume defects in aircraft which utilise bleed air by analysing the changes in the air quality as the configuration of the Environmental Control System (ECS) was altered.

**Synopsis:** John will focus on the journey to develop the method, the results obtained and the opportunities this type of analysis presents with respect to isolating the defect, minimising Ground Time, protecting Ground Engineers and providing an increased level of assurance during the Return To Service of aircraft.



Flight Crew Members Say Toxic Air in Plane Cabin Harmed Their Health. To view video: <http://abcnews.go.com/US/flight-crew-members-toxic-air-plane-cabin-harmed/story?id=43231109>

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**Light supper:** *Following John's presentation a light supper (pizzas) will be provided to give the speaker and attendees the opportunity to network, mingle, and to continue discussions.*

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**Wings over Illawarra – 5-7<sup>th</sup> May, 2107:** The Sydney and Canberra Branches of the Society in conjunction with the AIAA Sydney Student Branches, combined to jointly display at Wings over Illawarra 2017. The display was located in the AVIATEX 2017 trade component pavilion which proved to be a great location which saw plenty of foot traffic which allowed them to be introduced to *Cool Aeronautics* run by our Canberra Branch representatives Assoc Prof Andrew Neely (who is also our new Australian Division President) and SQNLDR Evan Smith. *Cool Aeronautics* is designed to introduce to everyone and in particular to children, the importance of STEM (Science, Technology, Engineering, and Mathematics). Highlights of the flying display including the 'Wall of Fire' can be viewed: <https://www.youtube.com/watch?v=2btWP9LW59s>

**AUVSI XPONENTIAL 2017 - DALLAS:** To May 8-11: The Association for Unmanned Vehicle Systems International held XPONENTIAL 2017 in Dallas, Texas, USA, May 8-11. AUVSI XPONENTIAL 2017 is the largest trade show for the unmanned systems and robotics industry. More than 7,000 industry leaders and professionals from more than 55 countries attended the show. The 2017 exhibit hall showcased more than 600 cutting-edge companies from around the world, representing more than 20 industries. In addition, there were more some 100 educational sessions, providing information about the future of unmanned systems policy, regulations and technology. The Association for Unmanned Vehicle Systems International (AUVSI)—the world's largest non-profit organization dedicated to the advancement of unmanned systems and robotics—represents more than 7,500 members from more than 60 countries involved in the fields of government, industry and academia. AUVSI members work in the defence, civil and commercial markets. There will be a more detailed report next month.



**Boeing Aircraft First Flight:** To watch the first flight of the 787-10 which took place Friday 31<sup>st</sup> March, 2017 click **Watch here!** and also - Boeing Completes Successful **First Flight of 737 MAX 9** – for further information visit: <http://boeing.mediaroom.com/index.php?s=20295&item=129882>

**Membership Information:** Annual memberships commence at only \$145 or \$28 for Students (but free for the first year). Being a member helps us sustain a vibrant activities programme and opens the way to access restricted 'member-only' events.

**Closed Member Only Group on Facebook:** Sydney branch is trialling a live video streaming service of monthly branch lectures. Watch lectures live or at a later time, at the “Royal Aeronautical Society - Sydney Branch - Members Only” group within Facebook. Please note that this service is only available to financial members of the Royal Aeronautical Society.

**Closing date for Centennial Scholarship Applications 31<sup>st</sup> May, 2017:** In 2003, the Royal Aeronautical Society launched the Centennial Scholarship Fund in celebration of one hundred years of flight and to look forward to the next generation of aerospace pioneers and experts in the 21st Century. There are two Centennial Scholarship categories: individual and team. For further details refer: <https://www.aerosociety.com/news/closing-date-for-centennial-scholarship-applications-is-31st-may/>

**From our Friends at the Aviation Historical Society of Australia: Air Britain Drover Book: "De Havilland Drover, Australia's Outback Workhorse".** Would you like a copy of the wonderful book by Geoff Goodall? His book covers the history, development and operational use of the Drover. Also included are 2 pages of specially produced scale drawings, and a page of profile artworks by Juanita Franzi, who has arranged with Air-Britain to bring in a bulk order of Drover books - if there is enough interest. This will save on the postage for each book and the hassle of dealing in Pounds. By doing it this way, the cost of the book would be about \$48.00 + local P&P (approx \$12.00) If you are interested please email: [juanita@aeroillustrations.com](mailto:juanita@aeroillustrations.com) When Juanita has enough numbers she will confirm the final cost. Refer: [Aeroillustrations.com](http://Aeroillustrations.com) Facebook: [Juanita Franzi Aero Illustrations](https://www.facebook.com/JuanitaFranziAeroIllustrations) Mobile: +61 (0)410 341 343 Phone: +61 (0)2 8084 0199

**MY AFFAIR WITH "CONNIE" – by Captain Reg Darwell. (Part 1) - Refer the Vintage Car Club magazine No 390 dated May 2017 -** <https://www.shannons.com.au/club/carclubs/vintage-car-club-of-queensland-vccq/>

I was a teenager hanging out on the North Shore with other testosterone muddled kids doing what teenagers do in the late 1950s. Cars were the weapon of choice in those days, old ones in particular eg. Morris Cowleys, Ford V8Mercurys and Vauxhall30/98s. An MG A was the thing to have whilst those of more limited means could buy a new Mini Minor to impress the ladies. I, fortunately as it turned out, had done a "Faust" and sold my soul to the devil known as Aviation. All the money I could rake together as an office boy with Qantas and working shovelling dangerous chemicals in a chemical factory went on flying lessons, so my transport was an old and pretty battered Renault 750. But it was pink! In the Qantas office and mail room I was required to run messages for the Qantas founder, Sir Hudson Fysh. He knew damned well what us "Junior executive trainees" were up to and it wasn't preparing for a life in Head Office! Occasionally, he would invite us in to his office to ask how our flying was going and to reminisce on his early flying days. I managed to get accepted in to an Airline Pilot Training Scheme which was a two year course graduating with a Commercial Pilot Licence, Instrument rating and the theory exams for a Flight Navigator Licence. The cost was two thousand pounds that I had to repay over

a four year period. Hopefully, if I was employed I would be able to meet these payments. I don't want to think about what would have happened if I bombed out. My first trip as a trainee navigator was Sydney - Manila on a Super Constellation in 1961. That's when the "affair" began. In those days navigation was done mostly by the stars using a periscopic sextant that poked up through a hole in the roof and lots of mathematical calculations. It was very exciting stuff for this young "space cadet" as the old wartime hands called me. Sometimes they would even let me have a fly! The engines in the Constellation were very unreliable compared with today's jets. It was not without cause that the



Connie was described as the best three engined aircraft that Lockheed ever produced. In my 1000 hours on Connies I experienced seven engine failures, two resulting in in-flight fires. In the subsequent 23,000 hours on jets – only three failures! I told you it was exciting! One of my mates, who was on his first trip, was on the Connie that crashed after failing to stop after an engine failure prior to the commit speed on take-off at Mauritius. Due to the excellent training of the crew and the leadership of Chief Steward Pat McGann during the evacuation, the only injury was a sprained ankle to the Flight Hostess. The aircraft was destroyed by fire. Oil consumption on these big 52 litre engines was a factor that at about 40 litres per hour (total) could sometimes limit the range of the Connie. As with most man-made vehicles, there is never enough power even with 145 octane fuel that was available then. Qantas pushed them pretty hard to give a cruise speed of 240-250 knots. The superchargers were a two speed affair. At about 15,000 ft. on the climb two symmetrical engines would be throttled back and the gear drive changed to "high blower" to compensate for the lower density air. Metallurgy was pushed to the limit of the times as the turbine would spin at about 23.000 rpm and sometimes fly apart. The engines would then be pushed up to climb power and the procedure repeated for the other two engines up to a

ceiling of about 25,000 ft. This was a fascinating business performed by the two Flight Engineers. It really was a Flight Engineer's aircraft. The pilots called for the power settings and the engineers gave them what they could, a bit like a ship. (To be continued)

**2017 Diary:** **June 28:** ATSB to present 'The Science Behind the Search for MH370'.

**July 19-21:** 2017 Aircraft Airworthiness and Sustainment (Australia) Conference, a non-profit event for the benefit of all those involved in sustaining our fleets, both **Civil and Military**, safely and economically through their lifecycle. The Conference will be held at the Brisbane Convention and Exhibition Centre. Call for papers announced with abstracts containing no more than 300 words to be received for review by 14 April 2017. **Delegate and Exhibitor Registration is open now.** Refer details: <http://www.ageingaircraft.com.au/aasc>

**July 26:** Aviation Safety Forum.

**Aug 14-29:** 'Total Solar Eclipse Tour' Including visits to famous USA Astronomical and Aerospace Facilities. For further details please contact The Sutherland Astronomical Society Inc. Email: [info@sasi.net.au](mailto:info@sasi.net.au)

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**Oct 18:** **59<sup>th</sup> Sir Charles Kingsford Smith Memorial Lecture to be delivered by Jayne Hrdlicka, Chief Executive Officer, Jetstar. Venue Powerhouse Museum, Ultimo. Further details to be advised.**

**Nov 14-16:** 5<sup>th</sup> International Conference on Aerospace Science & Engineering (ICASE). Refer details: [www.ist.edu.pk/icase](http://www.ist.edu.pk/icase)

**Aerospace Websites:** [www.57rescuecanada.com](http://www.57rescuecanada.com) : Follow Capt. Karl Kjarsgaard's adventures to recover Halifax bomber LW170 which is resting beneath 5000ft of water off the Irish coast;

[www.adastron.com/707/updates/updates.htm](http://www.adastron.com/707/updates/updates.htm) : Diary of Boeing 707-138B XBA formally Qantas EBA.

[www.airshow.com.au](http://www.airshow.com.au) [www.atsb.gov.au](http://www.atsb.gov.au) [www.aviationmuseum.com.au](http://www.aviationmuseum.com.au) - Temora Aviation Museum;

<http://boxkite2014.org/book/book.htm> : The Boxkite project.

[https://en.wikipedia.org/wiki/Rolls-Royce\\_Trent](https://en.wikipedia.org/wiki/Rolls-Royce_Trent)

<http://hars.org.au/> Historical Aircraft Restoration Society

<https://herox.com/SpacePoop> The Space Poop Challenge [www.powerhousemuseum.com/whatson](http://www.powerhousemuseum.com/whatson) ;

<https://qfom.com.au/> Qantas Founders Museum, Longreach, Queensland [www.singapore.com.sg](http://www.singapore.com.sg)

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