

## Speech by Permanent Secretary for Defence Chan Yeng Kit at the Singapore Aerospace Technology and Engineering Conference 2014

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Distinguished Guests, Ladies and Gentlemen, Good Morning.

Welcome to the Singapore Aerospace Technology and Engineering Conference 2014 or SATEC 2014 for short.2014 marks the 111th year since the Wright Brothers took to the skies in the first-ever powered flight. Since then, mankind has gone supersonic, landed a man on the moon, and sent a spacecraft outside our solar system and many other achievements in the aerospace theme. And just 10 years ago, a new milestone was reached when the first private manned spaceflight took place in Burt Rutan's SpaceShipOne. I think it is fair to say that the aerospace industry, more than many other traditional industries, has seen the most technological innovation over the last century. Moving forward, this is set to continue, given the strong growth expected in the coming years.

Outlook for the Aerospace Industry

Overview and Prospects for Global and Regional Aerospace IndustryGlobally, the aerospace industry is estimated to have grown by 6.8% in 2012 with final 2013 figures and 2014 forecast expected to be in a similar range. Asian markets, in particular, are expected to grow at a much faster rate driven by their growing middle-class that is more inclined to travel by air. Asia's 2012 year-on-year growth in passenger traffic stood at 6%, out-performing Europe's 5.1% and North America's 1.1%. Correspondingly, Asian airlines are building up their fleets and placing large orders. Airbus and Boeing estimate

that more than a third of worldwide aircraft deliveries will go to Asia in the next two decades, making Asia the biggest airline market in the world by 2031.

Aerospace defence spending among Asian countries is similarly showing positive growth. Markets such as India, China, Russia, South Korea, and Japan in particular are showing strong potential. Many of these countries have the necessary wealth to equip or modernize their military with the latest generation of aircraft with advanced technologies. For example, China and Russia are expected to account for up to 32% of all aerospace defence spending by 2016, up from just 17% in 2011.

Singapore as Aerospace Industry Hub

Singapore is also capitalizing on the rapid growth in the aerospace industry. Building on our success as a global air hub through the adoption of liberal aviation policy, Singapore has invested heavily to develop the country as an important and thriving aerospace hub. Since 1990, Singapore's aerospace manufacturing output has grown at a compounded annual growth rate of over 10%, registering a record S\$8.7B in 2012 and employing more than 19,100 workers in Singapore. Backed by a large pool of over 100 aerospace companies, Singapore is also the regional leader in aerospace maintenance, repair and overhaul (MRO), contributing over 25% of the region's output. Leading 3rd party MROs such as ST Engineering and Goodrich are able to carry out comprehensive nose-to-tail MRO services, from airframe maintenance to engine overhaul, to aircraft modifications and conversion.

Build-Up of the RSAFThe success and growth of the aerospace industry in Singapore has helped to attract the necessary aerospace capabilities and talent for the development of the RSAF over the last four and a half decades. These capabilities and human capital have enabled our air force to make rapid progress in its development. From its humble beginnings with just 2 Cessna aircraft, 6 pilots and a handful of British trained technicians in 1968, our air force today operates a whole suite of advanced aircraft such as the F-15SG, S-70B Seahawks, Heron-1, and the G550 Airborne Early Warning aircraft.

Each of these systems, while capable on their own, are integrated as part of a larger networked system. This allows the RSAF to fulfill a full spectrum of missions from protecting Singapore's sovereignty to assisting in humanitarian aid and disaster relief as a responsible member of the international community.

Trends and Challenges in the Aerospace Industry

While prospects for the aerospace industry generally look positive in the coming years,

there are some trends which may pose a challenge and reshape the landscape of the industry. Allow me to briefly touch on three trends that stand out.

### Trend 1 - Intensifying Cost Pressures

Firstly, aircraft OEMs will have to contend with intensifying cost pressures faced by operators. In spite of steady growth in the commercial sector, strong profits remain elusive. Current projections estimate operating margins of just 3.3% in 2013. Commercial operators are being squeezed on both sides: high fuel prices have raised operating costs, while low-cost carriers and new global competitors have kept pressure on pricing. In the defence sector, increased budgetary pressures have driven militaries to look for ways to reduce costs while maintaining operational readiness. Commercial and military operators are now much more cost conscious, demanding lower investment costs for better technologies and capabilities, as well as lower life cycle costs. OEMs must therefore develop cost strategies and new product offerings that are affordable and sustainable. All elements of cost - labor, material, overheads - must be addressed holistically.

### Trend 2 - Increasing Technological Sophistication

Secondly, OEMs today are incorporating new technologies and innovations with a greater focus on lowering operating costs, reducing aircraft down-time, and squeezing more efficiencies from their products. This focus may drive the pace and extent in which these new technologies and innovations are introduced. One example is in the increased extent to which advanced materials and composites are used in aircraft such as the Boeing Dreamliner and the Airbus A350XWBs. While such increase in technological sophistication presents obvious benefits, there could be challenges in the operations and support, if operators and MROs do not keep pace with changes needed in training,

Vational Archives of Singapore Trend 3 - Consolidation of Sector

Finally, aircraft OEMs, now wanting to capitalize on the growth in the MRO business, are seeking to consolidate by reviewing their portfolios and extending their reach into the aftermarket support and services business. For example, Airbus Flight Hour Services and Boeing EDGE, both being the aftermarket services and support arms of the respective companies, could become major players in this segment in the coming years. With aircraft OEMs extending their reach into the MRO business, independent MROs will need to re-think their traditional business models and strategies, as OEMs possess the intellectual property rights and first hand access to the operators.

Singapore's Response

For Singapore, these trends will undoubtedly have differing impact in the various sectors. Allow me to share a few of the initiatives that Singapore has adopted in response to these trends and challenges. For some countries, these may or may not apply.Singapore's strategy is centred on capability development as a sustainable approach to the myriad challenges that the industry may throw up. Capability development that is done at two levels - at the company level, and at the people level.

Corporate Competency

Let me first speak briefly on the company level.

Technological sophistication and the pace of innovation has been increasing in the aerospace industry. In an effort to establish itself as an R&D hub, Singapore has put in place various funding programs and infrastructural support to encourage companies in the local aerospace industry to participate more actively in research and development. For example, the A\*STAR Aerospace Program was launched just about seven years ago in 2007 to conduct pre-competitive research work with strong industry participation in the aerospace domain. To date, there are 19 companies in the consortium, including Boeing, EADS, GE, and Honeywell. Singapore continues to attract leading aerospace companies to establish new R&D facilities in Singapore. Most recently, Rolls-Royce opened its Advanced Technology Centre in the Seletar Aerospace Park.

In order to support growth in the aerospace industry, Singapore has developed the Seletar Aerospace Park, which spans 320 hectares of purpose-built land and infrastructure. The park allows companies to reap the benefits of a world-class business infrastructure, and synergies from cluster integration. Since the last SATEC in 2012, various MNCs, such as Eurocopter, Bell Helicopter, Cessna Aircraft, Fokker Services Asia, Hawker Pacific and many others have opened new facilities in the park. Local MROs such as ST Aerospace have also benefitted from the proximity to other aerospace companies. They are expanding their facilities and building new infrastructure for airframe maintenance and modifications. This puts the local MROs in a good position to partner with aircraft OEMs looking to make inroads into the local MRO business.

Workforce Competency

How competent a company or sector is, ultimately depends on the people in that company or sector. Hence, it is critical to invest in training and education.

Singapore is committed to developing its talent base to meet the needs of the industry. Singapore's Institute of Technical Education and five polytechnics provide a wide range of training for the aviation industry. Courses include the National ITE Certificate in aerospace and various diplomas in aerospace and aeronautical engineering. Amongst Singapore's universities, a specialised aerospace engineering degree is available at the Nanyang Technological University, while UniSIM offers two aviation degrees in partnership with Embry-Riddle Aeronautical University. These courses have allowed us to produce over 1,500 aerospace graduates annually. Moving ahead, with greater demand for trained aerospace personnel, Singapore will expand the intake capacities for aerospace programs.

To strengthen the link between academic education and application in the aerospace industry, Singapore's education and training institutes have established collaborations and partnerships with various companies in the aerospace industry. For example, the National University of Singapore recently launched the Centre for Aerospace Engineering in collaboration with DSO National Laboratories, SIA Engineering and ST Aerospace. The centre aims to excite young engineers today about the cutting-edge technological developments in the aerospace industry. It also contributes to the supply of a highlyskilled pool of aerospace engineers to fulfill anticipated manpower needs as the aerospace industry grows.

At the same time, Singapore is fast becoming a regional training hub for the aerospace industry, with various operators and OEMs establishing training facilities here. One such example is Lufthansa Technical Training, which partnered with Temasek Polytechnic to jointly offer a diploma course for Licensed Aircraft Engineers. Another example of a regional training hub is Rolls-Royce's training centre in its Seletar campus that offers more than 400 different modules and trains up to 4,000 aerospace personnel a year.

Our air force has benefitted from the greater focus on aerospace training. The RSAF has partnerships with various institutions, such as UniSIM and Embry-Riddle, to upgrade its personnel. As the RSAF operationalises more advanced and networked systems, we will need to build a more knowledge-intensive engineering workforce and deepen the technical competency of our people. Our air force has consequently begun to sponsor our officers for post-graduate PhD studies. A key enabler for these partnerships and post-graduate studies was the introduction of the Military Domain Experts Scheme (MDES), which extended the retirement age for engineers and maintainers to age 60.

### Conclusion

The long-term prospects of the global aerospace industry remain bright. In Asia and Singapore, this growth is further bolstered by rising demand from regional economies such as China, India and ASEAN countries.

As the landscape is continually reshaped with new technologies and competitive challenges, Singapore is committed to the further development of our infrastructure and manpower capabilities to support the future growth of the aerospace industry here.

The RSAF similarly, will work closely with its partners to tackle the challenges and seize the opportunities that new technologies bring.

Let me end by thanking the RSAF and SIAE for organising this conference and providing the opportunity for us to be here today. I wish everyone a fruitful and enjoyable conference.

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