



NEWS RELEASE

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Speech by Minister of State for Defence, Dr Mohamad Maliki Bin Osman, at the Young Defence Scientists Programme Congress 2014

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Permanent Secretary (Defence),
CE DSTA and CEO DSO,
Board Members,
Principals and teachers,
Parents and students,
Ladies and gentlemen,
A very good afternoon.

Let me begin by thanking you, our bright young minds for your active participation and contributions. This year, the Young Defence Scientists Programme is proud to have 29 scholarship recipients, 59 academic award winners, and over 400 students from 13 schools taking part in the YDSP activities. Your presence reflects young Singaporeans' passion for defence science and technology.

Technology is transforming the way our societies operate and how we run our lives. Mobile devices, social media and the internet shape the way we live, work and interact with each other. Some have said that it is technology that has also affected the way we think or not think - sometimes because technology does everything for us, it does not allow us time to think. For example, giving quick immediate responses to social media posts that may have quick significant impact on others. I can imagine, whenever we receive an email or you see a post on Facebook, sometimes we do not even have time to think, we just automatically click or we just key in something and you send it out. And sometimes you do not even think about the implications of what we say. And that is really what technology does for you. Today, you can actually snap pictures, record videos

and share these experiences on social media almost instantly, and we have seen the potential impact this may have on our society today. I never knew how much going out for dinner means to everybody today because every time I go out for dinner with my children, before we can start eating, they must take a picture of the food on the table. And I am sure every one of you does that, and instantly it is on Instagram, so that every other Instagram you see is pictures of food and that was not how I had dinner not even many, but three, four years ago. We just go to the restaurant, the food comes and we enjoy. But you cannot do it until you go through that ritual of taking a picture, and sending a picture out. Well, that is today's world. That is today's world for the young generation today. I think those who are older like me will always wonder what that is all about.

Well, that is the way society is today. Advanced Q&A engines like Wolfram Alpha simplify research work by generating direct answers to questions, just like in Star Trek! So Star Trek is not just a movie anymore, it is something that can actually happen. Indeed, the application of advanced technology has enabled scientists to push the limits of achievement beyond what was previously imagined. For those students today, you probably do not remember the show called Space 1999. For those who are older, we remember. We grew up with Space 1999, and today is the year 2014. Space 1999 does not exist anymore, so we will have to think about maybe Space 3000, and you can just imagine what it is going to be like. We cannot imagine what it was before, but today things have become a reality, We have witnessed the wonders of 3D printing and its multiple applications, in fields as diverse as medical science, fashion design and more. Recently, NASA researchers have assessed that 3D printing could even allow food to be produced in space shuttles, allowing astronauts to sustain longer deep-space missions to explore further reaches of unexplored space. Just imagine, you print your own food – maybe that is the next thing. You know, waiting for your food to come to the table, to take picture. You print your own food, after you print it, you take a picture, you put it up again.

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The potential for discovering breakthrough solutions and creating new capabilities by harnessing the latest technological tools are endless and indeed exciting. The YDSP has, for many years, provided a means for our youth to discover the important role of technology not just in our everyday lives, but critically, for the defence for Singapore. The YDSP is a unique opportunity for our youth to have a glimpse into the exciting world of our defence engineers, hear from them first-hand about their work and have hands-on experience in designing and prototyping innovative solutions to some of the tough problems our defence engineers face today. We hope through the exposure, our young minds can be further enthused and inspired to delve deeper into this field and build on the knowledge base and challenge new frontiers of technology and knowledge.

Our pioneer generation of defence leaders recognised very early on that it was necessary

to have a strong core of indigenous scientific and engineering expertise to develop the military wherewithal to defend ourselves. We need it. We cannot just depend on others, we need to have our own indigenous capabilities. Singapore does not have the luxury of space, manpower or budget that many other countries may enjoy. But our people, who embody the Singapore spirit of ingenuity and strive for excellence, are our strategic advantage and greatest resource. Over the past few decades, we have continually challenged ourselves to turn our constraints into opportunities, to develop solutions that require less manpower and yet deliver the greatest punch for our limited budget.

Today, our defence technology community has grown to include engineers and scientists across MINDEF, the SAF, DSTA and DSO, allowing us to fuse operational and technological expertise together. This community is what we sometimes term as the "fourth service" in the SAF. The SAF has got three main services - the Army, the Navy and the Air Force. So this is what we call sometimes the "fourth service", the service that not many know about, in addition of course to the Army, Air Force and Navy. In fact, our 5000 strong defence technology community constitutes one of the largest pools of engineers in Singapore. We have also established strategic partnerships with the larger scientific community, such as with the Temasek Laboratories at NUS and NTU, to tap on their ideas and expertise to test and apply promising solutions for the next-generation SAF. The effectiveness of each new system that the SAF employs depends on our defence scientists' and engineers' ability to develop customised solutions for our unique defence needs. This also enables us to stretch our defence dollar, to get the most bang for our buck. And that is really what Singapore is about - always, always taking advantage of the last dollar that we spend.

Take the RSAF's F-15SG fighter aircraft for example. Our DSTA engineers upgraded the aircraft with the latest avionics, sensors and advanced weapons, like the Active Electronically Scanned Array (AESA) radar, so that it can detect and engage targets from further away. Our engineers have also networked the F-15SGs with the Unmanned Aerial Vehicles (UAVs) and land forces, so that our land and air platforms can sense threats and swiftly attack where needed. This ability to operate as part of a larger integrated force multiplies the effectiveness of each aircraft, ship or tank, thus giving us the edge in the battlefield.

Another example is the Navy's Archer-Class submarines from Sweden, which we upgraded and modified so that they could operate well in our humid climate.

Technology has also transformed the way our soldiers train. Some of you visited the newly commissioned Multi-Mission Range Complex (MMRC) developed by DSTA during the Science and Technology Camp. Using computer-generated images, our soldiers can now practise live firing under various simulated combat scenarios. Different

training environments can be simulated at the click of a button. Target practice - even for complex scenarios - is now more efficient because training can be conducted independent of the weather or time of day. This shows how, if we put our minds to it, we can find solution to the most challenging circumstances - e.g., the efficient use of technology within the constraints of limited land availability. Before this, to do night shooting, we have to wait for night fall. And when night fall comes, when it rains, sorry no night shooting. But today with the MMRC, day or night, rain or shine, our soldiers get to train, our soldiers get to do the live firing with various scenarios that can be created through the MMRC. It shows how efficient we can be now and how effective our soldiers can train.

The SAF has also ventured into games technology to train our new generation of soldiers. Not to allow them to play games for training, but using technology for the new generation of soldiers because they are quite familiar with this technology. Our DSTA engineers worked closely with the SAF to design a game called "Decisive Combat", where the objective is to test the critical thinking and decision-making skills of our junior officers under various combat scenarios. It was the first time that we have developed a serious game on a mobile device, and quite happily for us, it emerged as the "Best Serious Game" in the Government category at the 8th Annual Serious Games Showcase and Challenge - Serious Games Showcase and Challenge, not the playful type, the very serious ones because it is really applied to our context -held in the United States last December. For those gamers out there, there are those fun games, there are those serious games. When it comes to MINDEF, when it comes to the SAF, it is serious games that we get to play.

The challenge for our defence scientists and engineers is to prepare the SAF to meet its future challenges and operational needs, in an uncertain security environment where new threats are constantly emerging. This requires our defence scientists to develop cutting-edge technological solutions to stay ahead of the challenges. There are many new frontiers waiting to be explored. Unmanned technologies and robotics is one such area. I am glad to hear that over 50 students took part in two of the Science and Technology Camps this year - Recce and Clear Explosives and Dex Bots where they built their own robots to undertake various challenges such as clearing obstacles on land and underwater exploration.

Some of the work of our engineers and scientists even has applications outside the field of defence. The advanced microchips that Temasek Laboratories and DSO are working on for our sensors and communications systems can potentially be used in vehicle radar systems to prevent collisions.

Today, it is impossible to imagine an SAF without its defence scientists and engineers. They have been instrumental, working tirelessly behind the scenes, to maintain the SAF's

superior edge as a technologically advanced military force. I hope your experiences in the YDSP have inspired you to pursue your passion for defence science and engineering, and I encourage you to consider future opportunities to join the ranks of our defence scientists and do your part to keep our country safe.

So my heartiest congratulations to all of you for successfully completing the programme. The future of our cutting edge defence capabilities lies in your hands. My deepest appreciation also goes to the mentors for generously sharing your knowledge with our young participants. I am sure you have been an inspiration to all of them.

I wish you all the best in your journey of discovery. Thank you.

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