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Keynote Speech by Major-General (NS) Ng Chee Khern, Permanent Secretary (Defence Development) and Second Permanent Secretary (Health) at Maritime RobotX Challenge 2014

24 Oct 2014

Your Excellencies,
Distinguished Guests,
Ladies and Gentlemen, INTRODUCTION I am pleased to be here this morning to witness the launch of the Maritime RobotX Challenge 2014.

First of all, let me extend a warm welcome to our friends from abroad, participants from Australia, Japan, South Korea and the United States.

TECHNOLOGY AS FORCE MULTIPLIER

The backdrop of the Marina Bay symbolises a modern and thriving cosmopolitan city. As a small city-state with no natural resources, Singapore cannot take what we have achieved today for granted. We therefore recognise that technology has been and is a critical factor in overcoming our constraints.

The Singapore Armed Forces (SAF), in particular, leverages on technology so that it can achieve its mission with less manpower resources. For example, the Army deploys only three men to fully operate the High Mobility Artillery Rocket System (HIMARS), as compared with 12 men needed for most other artillery systems. The Formidable-class frigate in our Navy has a lean crew of 70 men compared to typical crew strength of about 100 men when operating a ship of similar class.

We have also leveraged on unmanned technology to give the SAF an edge. Today, our

Army's scout teams conduct reconnaissance missions using the Skyblade III Unmanned Aerial Vehicle, which was indigenously developed and that allows our troops to see further. You may have heard about driverless cars, but how about something bigger like a driverless Armoured Personnel Vehicle? Thanks to our defence scientists and engineers who have worked tirelessly, an unmanned armoured vehicle should become a reality soon. Indeed, unmanned technology is a key transformational enabler for the 3rd Generation SAF.

Going forward, the role of unmanned technology will grow as the SAF faces a shrinking force size brought about by declining birth rates among Singaporeans. Hence, the need for autonomous technology.

AUTONOMY

To make the unmanned systems truly "unmanned", it is not only to take the man or woman out of the platform, but most importantly, to take them out of the equation.

A high degree of autonomy will surely help to reduce the manpower burden. It will also reduce the reliance on high bandwidth communications and shorten decision making processes. For the vision of Unmanned Systems to be fully realised, the key focus is Autonomy, which is the ability to sense and respond to the environment, and the ability to understand the assigned tasks and execute them as well as to interact with other unmanned systems.

ECOSYSTEM CAPABILITIES

For the past few decades, we have built up a robust defence ecosystem in Singapore comprising the Defence Science and Technology Agency (DSTA), DSO National Laboratories, Singapore Technologies Engineering, our four universities and the research institutes in Agency for Science, Technology and Research (A*STAR). Our engineers and scientists are at the forefront of the SAF's 3rd Generation transformation. We have built a strong ecosystem and will continue our investments in defence research and development to enhance SAF's ability to safeguard Singapore's sovereignty and security.

INTERNATIONAL COLLABORATION

But there is a limit to how much we can achieve by ourselves. We strive to work with like-minded and technologically advanced international partners. Countries across the world are also looking into autonomous systems. Be it driven by the need to overcome reducing manpower resources or other imperatives such as increasing efficiency, or saving cost and lives, the inherent advantages of autonomous systems are common to all.

So this presents an excellent avenue for international collaboration.

MARITIME ROBOTX CHALLENGE

The idea of this Maritime RobotX Challenge arose from our collaboration with the National University of Singapore and the U.S. Office of Naval Research.

The theme of "Unmanned Systems for Maritime Security" was chosen because Singapore has one of the busiest ports in the world and hence keeping the sea lanes safe and secure takes on great importance. However, this is not unique to Singapore but also applies to other countries.

Today we are glad to see 15 teams participating in this international competition, three from each of the participating countries, namely Australia, Japan, Singapore, South Korea and United States. Each team will receive an identical platform - a 16-foot Wave Adaptive Modular Vessel (WAM-V®). The teams then design their own unique technical solution to outfit the standard platform with sensors, computers and algorithms that enable the USV to complete a series of maritime missions. By providing teams with the same platform, the challenge would then be focused on the harder problem of autonomy.

SCIENCE AND TECHNOLOGY SHOWCASE

Science and Technology enables the SAF to maintain its fighting edge. Ministry of Defence is committed to attracting more Singapore students to join the fields of Science, Technology, Engineering and Mathematics (STEM) to meet our future demands.

Besides witnessing the innovation, creativity and enterprising spirit of the participating universities, we also have Science Centre Singapore to organise the Science and Technology Showcase in conjunction with the Maritime RobotX Challenge.

The Science and Technology Showcase features live demonstrations, workshops and mini competitions in areas of robotics and autonomous technologies.

Though the Maritime RobotX Challenge has serious and important objectives, we would also like to bring out the fun and exciting aspects of Science and Engineering. We hope the visitors will be enthralled by the global shows of the LEGO robots and robot building workshops. And in return more students will be inspired to join and explore the challenges in this field in the future.

CONCLUSION

In conclusion, I would like to thank the U.S. Office of Naval Research for jointly

organising this event.

I wish all the participants a fruitful and enriching experience in the Maritime RobotX Challenge. Regardless of whether you emerge as the winner of the Challenge or not, I hope that you will continue your passion in Science and Technology and further your interest in robotics and autonomous unmanned systems in the future.

Thank you very much.

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