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Opening Address by Permanent Secretary (Defence Development), Mr Chan Yeng Kit at the Inaugural Asian Edition of the International Naval Engineering Conference at IMDEX Asia 2013

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Chief of Navy, Rear-Admiral Ng Chee Peng,
Distinguished Guests and Delegates,
Ladies and Gentlemen,
Good Morning.

It gives me great pleasure to deliver the opening address for the inaugural Asian Edition of the International Naval Engineering Conference, or INEC in short. This conference, anchored by the internationally renowned Institute of Marine Engineering, Science and Technology (IMarEST), is a choice platform for all maritime defence and naval technology professionals to come together to exchange ideas, share insights, connect with one another, and collectively advance a common interest to push the boundaries of naval technology.

Held in conjunction with the International Maritime Security Conference, and alongside a plethora of exercises, visits and hospitality events, INEC adds to complete the IMDEX Asia experience, making it a truly "must go" premier event in this region.

The Technology Conundrum

While the focus for today is on Naval Technology, if you allow me to start by sharing some thoughts on something a bit more general. When we think of a technology that has impacted our civilian lives in a big way, information communication technology probably comes to mind. I am sure all of us here carry a smartphone, maybe more than one, or

some kind of personal digital device with us.

We now live in the "Digital Age". The onset can be traced to the introduction of the Personal Computer, or PC, in the late 1970s.

Douglas Adam, the author of the Hitchhiker's Guide to the Galaxy, once offered a stark description of how our understanding of this "Digital Age" had progressed with time. He said, and I quote,"First we thought the PC was a calculator.

Then we found out how to turn numbers into letters with ASCII - and we thought it was a typewriter.

Then we discovered graphics, and we thought it was a television. And with the World Wide Web, we realised it was a brochure."

We know for sure that the PC today is much more than a calculator, typewriter, television, or electronic brochure. And the "personal computer" has evolved, giving rise to tablets and smartphones and all kinds of devices. If you ask how I would describe such devices, I would say it is a "key" a key that enables us to enter a whole new world called Cyberspace, and the start of the "Digital Age". But I doubt the engineers who invented the microchip and computers could have envisaged the revolutionary effect of their inventions.

I think there are two learning points. First, the power of technology in transforming lives and work. Second, the need for us to be bold about new technology to fully exploit it.

These two learning points transcend the 'PC world' to the naval domain. Defence planners started to bring in Modelling and Simulation technologies for simple Operational Analysis in the 1990s. They would probably be surprised how much technologies have permeated our capability development process today, allowing us to understand system design limitations, so that we can optimise operational performance even before systems are built. Some advocates would probably venture to suggest that Modelling and Simulation technologies allow us to learn from the future rather than from the past, helping defence planners make multi-million-dollar decisions with confidence.

Modelling and Simulation technologies continue to play an important role in system optimisation. In Singapore's case, we use it quite extensively. For example, it was used in our Navy's new Littoral Mission Vessel program, to determine the optimal workflow design when we integrated the Bridge-CIC-Machinery Control Room into a common C2 Hub.

The theme for INEC this year, 'Riding the Next Technology Wave', reflects the importance of investing in the "correct" technology. But what is the "next technology wave"?

Within this room are over a hundred naval technology experts with probably a few thousand years of collective experience among you. So I hesitate to offer an answer. There is probably no single answer anyway, as what constitutes the "next wave" for each of us depends on our individual context.

For Singapore, I see force-multiplier technologies such as network-centricity, sense-making, mission modularity and unmanned systems, to be areas with potential for exploitation.

I am sure the subsequent discussions at INEC will offer you more insights on emerging technologies and trends. I encourage all participants to hear out the range of future possibilities, to expand the solution space for your defence development.

Technology as an Integral Part of Defence Development

The potential to bring out game-changing defence capability drives the pursuit of technology by the world's militaries. In response, defence industries also actively seed new technologies and offer a plethora of products and services to meet the varied mission sets of the world's militaries.

A walk through the exhibition halls outside will testify to this. With over 190 exhibitors, the potential permutations of military solutions offered are huge. Militaries are spoilt for choice. But sieving through the multitude of choices, selecting the most relevant solution and allocating resources optimally, require clarity about present and future needs.

So how then does one identify the right combination of technologies to deliver a sustained edge that is relevant today and ready for tomorrow?Again, I do not intent to offer a solution. Each country operates in a different context and will have their own considerations. Instead, if you allow me to briefly share our experience in Singapore.

We believe in a robust defence development cycle that is layered with careful considerations on different aspects of military capability development. For simplicity, we can perhaps think of these layered considerations as having defence planners put on different lenses - 3 lenses with the view to 'think big', 'think far' and 'think real'.'Think Big' - Alignment to Vision and Strategic Thrust

Firstly, astute defence planners should be clear about their vision and strategy. They must

always keep the 'big picture' in mind.

For example, today's interconnected world faces an ever-increasing spectrum of complex and trans-border security challenges, such as terrorism, piracy and pandemics. This evolving security landscape impacts force structure, manning and cost efficacy.

So it is important to have clarity on the evolving mission sets and key drivers. And to develop a coherent technology roadmap, weighted with opportunities and trade-offs, that is in line with the overall vision and strategy.'Think Far' - Development of Long-term Sustenance Strategies

Second, defence planners should 'think far', to develop long-term strategies for new and emerging capabilities. Building effective capability takes many years of planning and front-end investments in technologies. The long gestation periods can derail any military build up plan in the absence of long-term sustenance strategies.

For example, major ship acquisition programmes typically take about a decade or so from inception to the ship becoming fully operational. At the same time, the greater use of Commercial-Off-Shelf (or COTS) technology results in shortened life cycles of components. Rapid obsolescence of such sub-systems necessitates periodic technology refresh, system upgrades and capability insertions, so that the fighting platforms remain supportable and effective.

Defence planners will need to holistically address the twin challenges posed by a long gestation period and a shortened life cycle of individual component systems. The design must make up-front provisions for upgrading and expansion. Such long-term sustenance strategies are key.'Think Real' - Rapid Assimilation of Promising Technological Solutions

Third, defence planners should, what I call, 'think real'. In other words, planners need to accept the trade-offs inherent in the real world. We may have to quickly assimilate promising technologies even if these are not fully mature. Conversely, we have to be wary of technologies that over-promise.

Defence planners can take practical measures to mitigate risk in assimilating promising technologies. Once such measure is to embrace experimentation as a core strategy for defence development. Other possibilities include the use of modelling and simulation studies, that I mentioned about, to validate the feasibility of new technologies and concepts. In Singapore, again, we have successfully used such measures to quickly inducted the Protector Unmanned Surface Vessel and Scan Eagle Unmanned Aerial Vehicle into active service over the last few years.

Putting the 3 Lenses Together

I have briefly described how planners could use the 3 lenses of 'Think Big', 'Think Far' and 'Think Real' to strengthen the way one integrates new and emerging technologies into the defence development cycle. Having coherent technological roadmap, long-term sustenance strategies and the ability to quickly assimilate promising technologies are key to delivering a sustained capability edge that is relevant today and ready for tomorrow.

The Role of Industry in Defence Development

Finally, let me briefly touch on the role of defence industries in helping military capabilities grow.

Having responsive defence industries, with acute awareness and understanding of a military's needs, is crucial to capability development and transformation. On their part, defence companies must offer innovative and flexible solution sets, at an affordable price.

Defence industries can become valued partners by taking proactive actions early to apprise defence planners of significant technological breakthroughs and innovations. Such active engagements allow innovative concepts to be surfaced and developed at an early stage of planning, where there is greatest degree of freedom.

I believe it is with this mind that INEC is organised. INEC allows commanders, defence planners, technologists, engineers, industry and also academia, to come together.

Conclusion

In conclusion, with today's evolving security environment, militaries need to leverage on technology more than ever. I trust that INEC will give our defence planners plenty of food for thought, and open doors to new thinking and new possibilities.

I wish each and everyone a meaningful seminar, filled with insightful sharing and leading ideas, in this inaugural INEC@IMDEX Asia. Thank you.