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Fact Sheet: MINDEF Pride Day 2015 Award Winners and Smart Defence Initiatives

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(A) Minister for Defence Award (MDA)

The Minister for Defence Award (MDA) is presented to the MINDEF/SAF unit or department for their outstanding achievements in all components of PRIDE, namely, productivity and innovation, organisational excellence, resource optimisation and staff well-being. This year,**Naval Logistics Command (NALCOM)** of the Republic of Singapore Navy (RSN) clinched the MDA award for the second consecutive year.

NALCOM

NALCOM has been providing engineering and logistics support to all of RSN's platforms and systems in its naval bases, as well as supporting the RSN's training, exercise and operational deployments since 1986. Winning the MDA for the second time in a row means that NALCOM is now inducted into the Hall of Fame.

To stay ahead of the demand curve, NALCOM believes in innovating while it is still in a position of strength and to continuously seek better, more innovative ways to conduct its business. Staff are encouraged to form cross-disciplinary innovation teams and also to share best practices from their respective domains. To keep them motivated and also to infuse innovation into their daily work, staff's innovation contributions are recognised as part of their overall performance.

This dedication to inculcate an innovation culture in NALCOM has led to many innovative projects being implemented to help NALCOM support the RSN more effectively and efficiently. For example, NALCOM's project to enhance the civil resource requisition process by leveraging technology not only significantly reduced the effort and time required but also strengthened the overall governance of the requisition/de-requisition process. Such was the success of the project that NALCOM's Civil Resource Generation Centre (CRGC) has since been appointed to lead efforts to upgrade and automate the system used to generate civil resources for both MINDEF and the Ministry of Home Affairs (MHA).

(B) MDA (Organisational Excellence) [MDA (OE)]

The MDA (OE) is conferred on the MINDEF/SAF unit or organisation which has excelled in various aspects of their management processes and organisational systems in the past year. This year, the award goes to two formations - **7 Air Engineering and Logistics Group (7 AELG)** of the Republic of Singapore Air Force (RSAF) and the **SAF Ammunition Command (SAFAC)**.

7 AELG

7 AELG continued its vertical climb, capturing its consecutive Minister for Defence Award (Organisational Excellence) after winning the accolade last year. For 7 AELG, Organisational Excellence (OE) and Operational Excellence are deeply intertwined, two legs in its journey towards the ultimate goal of attaining mission success.

7 AELG has engendered a culture of continuous improvement and excellence. Its strong OE emphasis and innovative culture have energised the rest of the Paya Lebar Air base (PLAB) units, leading them to win the Best Air Base award. 7 AELG has also consistently proven that it is the best in operations among RSAF engineering and maintenance units. Its excellence is evident in the many awards it has won at RSAF, MINDEF, national and international levels and clinching the coveted title of the SAF Best Air Engineering Unit 13/14.

SAFAC

The SAFAC is blazing a trail of glory in 2015, achieving the SQC Star following its 3-in-1 Business Excellence (BE) standards re-certification and also winning the Minister for Defence Award (Organisational Excellence).

The emphasis on OE was a key factor behind SAFAC's emergence as a world leader in terms of speed of supply, safety standards and stringent accounting of ammunition, compared to other militaries. Bearing testimony to this was the observation by the benchmarking team from the UK Ministry of Defence which noted

that "SAFAC has a very effective safety policy and this is underpinned by a safety culture that is clearly visible at all levels of [SAFAC]… embraces innovation and all ranks are encouraged to contribute towards process and product improvement, accounting accuracy standards that is unmatched among advanced nations"

SAFAC recognises the need to be agile in responding to new challenges and adapting to changes in their operating environment. Hence, SAFAC is developing Forward Ammunition Support Capabilities, Local Ammunition Demilitarisation Capability and the Next Generation Explosive Storehouses to address future needs.

(C) MDA (Innovation)

The MDA (Innovation) is awarded to the unit or department that has best developed and implemented innovative projects with significant impact, while nurturing the outstanding qualities of its people. This year, the MDA (Innovation) award goes to **Force Generation Squadron (FGS)** of the Republic of Singapore Navy (RSN), while the MDA (Innovation)(Combat) award goes to **HQ 9 Division/Infantry**.

FGS

FGS generates full force potential for the RSN and SAF, through comprehensive preventive maintenance of naval assets to achieve the highest state of engineering readiness for the submarines, and also thorough the generation of maritime civil resources.

FGS believes that innovation is the key to achieving mission success. Faced with tightening manpower and resource challenges, both the command team and the people in FGS come together to meet such challenges by embracing change through continual learning and sharing with one another, and push innovation to the next higher plane.

Many of FGS' projects have contributed to better resource optimisation, higher availability of ships and strengthened support for wartime and peacetime requirements. For example, the project to streamline computer and hardware requirements of the frigates' Ship Management System (S.M.S) not only saved the organisation $40M but also reduced dependence on the original equipment manufacturer. FGS' project teams also believe strongly in collaboration with small and medium enterprises (SMEs) to develop and trial their ideas. For example, FGS collaborated with shipping companies to enhance civil resource platform availability with its contractors and shipyard and the partnership led to the development of RSN-yard joint safety manuals.

HQ 9 Division/Infantry

HQ 9 Division/Infantry believes that everyone has a role to play in innovation. Commanders are given autonomy to set targets and provide direction, as long as they do not deviate from any instructions or policies, or contravene safety. Staff are encouraged to surface their ideas, no matter how small or improbable which are deliberated at unit and formation level innovation meetings. When the project or idea is ready to be implemented, the collective will and resources of HQ 9 Division/Infantry are then mobilised to see the project to fruition.

With the combination of strong and clear leadership, openness to ideas, accessibility to resources and established recognition framework, the innovation culture has been firmly entrenched in HQ 9 Division/Infantry. Staff constantly look to improve things in their daily work to help them achieve their primary objectives. Collaboration across units in HQ 9 Div/Infantry also enabled quality Innovations such as "Modular Field Pack Frame" and "ACMS iLite", with the latter featured by ST Engineering during the Singapore Air Show 2012 attended by delegates from 70 countries. These Innovations enhanced operational readiness, safety and productivity of the unit.

(D) MINDEF Innovation Project Award

The MINDEF Innovation Project Award is conferred on project teams that have produced iconic, impactful and innovative projects. This year, the award is conferred on two projects - **"Naval Gun Performance Test Using Laser Technology"** (by Force Readiness Squadron (FRS) from the RSN) and **"Murai Urban Live Firing Facility (MULFAC)"** by (HQ 9 Division/Infantry).

Naval Gun Performance Test Using Laser Technology

- Challenge : The certification process for the OTO Melara Super Rapid Gun deployed across the RSN's warships is time consuming and laborious, as extensive preparation and set up is required. In addition, the test has to be conducted out at sea, increasing the safety risks and challenges presented by an open sea environment. The test results are captured on a piece of graph paper placed on an electrical motor-driven rotating drum. Not only is frequent changing of graph paper required, accurate interpretations of gun performance also pose a challenge.

- Innovation : The project team from FRS developed its own in-house test equipment by integrating three components - a highly accurate and precise LASER-based measuring device that is capable of sustained operation in an actual test environment, a decoder to read and convert the sensor output for data processing, and a computer installed with a spreadsheet programme. This simple yet highly effective and efficient solution eliminated the need for the original test kit and also reduced the time and resources required for testing.

- Benefits :

o Safer working conditions for servicemen

o Vastly improved performance test process

o Significant cost savings/avoidance of more than $200,000 per annum

o More than 90% man-hour savings

Murai Urban Live Firing Facility (MULFAC)

- Challenge : Military operations are expected to take place outside the traditional environment. However, existing facilities are unable to support large-scale live firing training in urban settings.

- Innovation : MULFAC was developed to support training for large-scale urban operation. Featuring the latest infrastructure and ballistic technology to enhance training realism by using live ammunition, MULFAC has helped to improve live fire training in urban settings.

- Benefits :

o Improved training realism

o Improved safety during training

o Reduced training duration by 67% from 3 days to 1 day

(E) MINDEF Savings and Value Enhancement (SAVE) Award

The Savings and Value Enhancement (SAVE) Award recognises the contributions of excellent Economy Drive initiatives by MINDEF/SAF units/departments and project teams. This year, the award goes to three projects: "**Emergency Ambulance Service for SAF and SCDF**" (by HQ Army Medical Service and DSTA); "**Streamlined Tanker Aircraft Operations**" (by Air Plans Dept and DSTA); and "**Cost Risk Balancing - Corporate Guarantee vs Banker's Guarantee** (by Naval Plans Department and DSTA).

Emergency Ambulance Service for SAF and SCDF (HQ Army Medical Service and DSTA)

- Challenge : Dedicated Emergency Ambulance Services (EAS) that respond immediately to serious casualties in the Training Area are critical in ensuring that the casualty receives earliest access to critical resuscitative care and direct evacuation to the hospital for earlier definitive care. With limited paramedic resources, MINDEF/SAF needed to engage Private Ambulance Operators (PAOs) to provide the EAS for SAF. However, the increased demand by the Singapore Civil Defence Force (SCDF) for such services to support the National Emergency System, coupled with the limited supply of qualified paramedics in Singapore and stringent requirements for the PAOs to meet national EAS standards, would inevitably raise costs.

- ED Effort : The team collaborated with the SCDF and the Ministry of Home Affairs (MHA) to re-design the processes and requirements for a joint EAS tender, culminating in the first-ever joint tender

for EAS by MINDEF/SAF, SCDF and MHA. Such an approach not only reduced costs, there was also less risk of the PAO not measuring up to national EAS standards.

- Impact : Not only did the joint tender generate significant cost savings, it also inspired public confidence in MINDEF/SAF's medical system. More importantly, this initiative serves as a good example for future collaborative tenders among public agencies. Compared to the price of contracting the SAF EAS on our own at S$15M/year, the contracted price of S$5.4M/year under the joint tender yielded an overall cost savings of S$9.6M/year for SAF.

Streamlined Tanker Aircraft Operations (Air Plans Department and DSTA)

- Challenge : The new Multi-Role Tanker Transport (MRTT) aircraft purchased by the RSAF was initially certified for four-crew tanker operation only. Nevertheless, the team was convinced that manpower could be optimised with a three-crew operation.

- ED Effort : Combining new and innovative ideas with their expertise of the KC-135R's three-crew operation, the team first streamlined and optimised the processes to operate the new MRTT. As the streamlined process is robust and also applicable to other operators, the OEM certified the MRTT for three-crew operation at no cost to MINDEF/SAF.

- Impact : In addition to the cost savings of S$4.6M/year, the team showed that the manpower optimisation can be achieved through a combination of deep domain knowledge and innovation. The three-crew certification provided the RSAF with the flexibility to scale the composition of the operational crew depending on mission complexity. This in turn allows MINDEF/SAF to better optimise manpower resource and lower operational life cycle cost.

Cost Risk Balancing - Corporate Guarantee vs Banker's Guarantee (Naval Plans Department and DSTA)

- Challenge : All the vendors that responded to a Call for Tender for submarines required advance payments. However, the Ministry of Finance (MOF) requires a Banker's Guarantee to be placed on advance payments. While this was meant to be a safeguard against default by the contractor, it inevitably drove up the procurement cost, as the cost of the Banker's Guarantee would be included in the contract price.

- ED Effort : The team conducted a risk assessment of the appointed vendor, and identified that the risk of default by the appointed vendor was low and that MINDEF/SAF's risk exposure could be equally mitigated with a Corporate Guarantee (at no additional cost) issued by the appointed vendor's parent company. The team obtained MOF's agreement to allow a Corporate Guarantee in lieu of a Banker's Guarantee.

- Impact : The project saved MINDEF/SAF S$25.6M, the cost of the Banker's Guarantee without compromising MINDEF/SAF's interests. In addition, the project paved the way for other procurement teams to adopt similar procurement practices, which would help MINDEF/SAF reap significant savings for other large value procurements.

(F) Smart Initiatives - Concept of Smart Naval Base

MINDEF/SAF is a Smart organisation and has always employed technology to build our warfighting capabilities. In line with the Smart Nation vision, MINDEF/SAF will now strengthen its emphasis on harnessing smart technologies to reap benefits to both the organisation and individuals. This includes greater use of automated technology so that our people can undertake higher value work, and greater connectivity that enables us to collaborate, share data and exchange ideas in a more seamless manner.

Recognising the manpower demographics, the need for greater integration in operations, and the changing expectations of a Smart Nation, the RSN has embarked on an innovative study to develop the concept design of the "**Smart Naval Base of the Future**". The additional dimension of human centricity is becoming more prominent in making things smarter to meet our needs. The availability of technologies and maturity of ideas have also made new concepts economically viable.

(G) Research and Technology Projects

Systems Technology for Surveillance (Project STARS) - by Temasek Laboratories & Singapore University of Technology and Design

The team aims to develop Intelligence, Surveillance, and Reconnaissance (ISR) platforms at greatly reduced scales, equipped with surveillance capabilities that can be deployed in urban settings, such as for search and rescue operations.

Human Robot Interaction System (HURISS) - by ST Engineering & DSO National Laboratories

The current Soldier Systems comprise the Advanced Combat Man Systems (ACMS) and the FUSION sensors (unmanned robots installed with sensors). Each Soldier System has its own control device. These devices use traditional interfaces that require both hands to operate while looking down, reducing the soldier's situation awareness and combat effectiveness. This project aims to create naturalistic and simultaneous control of various modules in the Soldier System, via augmented reality, gestural and voice control. This will increase the combat prowess and influence at the individual soldier level.

"Bird-like" flapping-wing UAV - by Temasek Laboratories & NUS

The concept of a flapping wing UAV challenges some of the fundamental understanding in aero-science and flight theories. In this project, the project team is collaborating with overseas research institute to explore

various aspects of flapping wing flight in the hope to replicate of the insect or humming bird's ability to hover and maneuver in an enclosed, indoor environment.

News Release:

- Smart Defence Vision Announced at MINDEF PRIDE Day 2015 (MINDEF_20150902001.pdf)