Technology Developments
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An overview of Janes reporting on Defence Technology, all stories derived from Janes Defence: News Module

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Disruptive Technology

Tokyo urged to increasingly focus on high-power microwave- and laser-based weapons

29 Mar: The Japan Ministry of Defense's (MoD's) National Institute for Defense Studies (NIDS) has urged Tokyo to increasingly focus on the development of advanced military technologies such as high-power microwave- and laser-based weapon systems to help counter the growing missile threat posed by neighbouring countries. Such technologies will most likely become a "game changer" in the field of missile defence, enabling Tokyo to shoot down multiple missiles simultaneously while drastically lowering the cost per intercept attempt compared with current technologies, said the NIDS think tank in its 'East Asian Strategic Review 2021'. Access the full report here.

AI development, training at the tactical edge inches towards reality

17 Mar: The ability for networked communications, intelligence, surveillance, and reconnaissance (ISR) and other artificial intelligence (AI)-enabled end-user platforms to update and enhance their embedded AI algorithms, based on the data collected on the battlefield in real time, could soon be a reality. The current slate of AI-enabled tools and associated algorithms being integrated into deployable combat and intelligence platforms for US Armed Forces and government agencies can execute "inference at the edge", as in predictive analysis of collected data to narrow down a list of potential options or outcomes for a combat commander, said Booz Allen Hamilton vice president Justin Neroda. Access the full report here.

EDA studying 'Predator suit' adaptive camouflage systems

17 Mar: The European Defence Agency (EDA) is considering how future soldier technologies could support adaptive camouflage systems to better protect dismounted personnel, industry officials said. Speaking as a member of the EDA's Adaptive Camouflage for the Soldier (ACAMS II) consortium at SMI's virtual Future Soldier Technology conference in March, Dr Max Winkelmann, signatorics scientist at Fraunhofer IOSB, explained that battle management systems (BMSs) and soldier modernisation ensembles could be combined to create adaptive camouflage. Access the full report here.

To see, or not to see: Thermal imagers advance but trade-offs abound

12 Mar: Nearly all armed forces require thermal imaging sensors. For many, though, the type of thermal imager selected will hinge upon an array of influencing factors and desired outcomes. Available technologies include the cooled medium-wave infrared (MWIR) imagers, the preferred choice for long-range applications and tropical climates, as well as cooled and uncooled long-wave infrared (LWIR) imagers. Silent Sentinel, a British company that manufactures thermal imagers, has developed a range of LR advanced thermal cameras, which merge the capabilities of cooled and uncooled thermal imaging optics. Access the full report here.

DRDO completes test milestone for fuel cell AIP system

10 Mar: India's Defence Research and Development Organisation (DRDO) has achieved a major milestone in the development of an indigenous fuel cell-based air-independent propulsion (AIP) system planned for retrofit to the Indian Navy's Project 75 Kalvari-class submarines. In a 9 March statement, India's Ministry of Defence (MoD) said that a land-based AIP prototype had successfully demonstrated both endurance and maximum power performance. Introduction of an AIP system will enable the Project 75 boats – based on the Scorpene design developed by France's Naval Group – to significantly extend submerged endurance at slow speed. Access the full report here.

China outlines technology priorities for 'new era'

08 Mar: The Communist Party of China (CPC) has released more details about its plans to accelerate military modernisation during the country's 14th Five Year Plan (FYP). A new draft of the 2021/25 plan issued on 6 March at the National People's Congress (NPC) in Beijing said priorities during the "new

era" featured new military technologies, skills and training, and a shift towards "intelligentisation". The draft – published by the People's Daily, the CPC's official mouthpiece – also highlights the significance that China will place on military-civil fusion (MCF) over the coming five years in supporting capability developments and China's efforts towards self-reliance. Access the full report here.

Air Innovation

Insitu advances UAV hydrogen fuel-cell technology

26 Mar: Boeing subsidiary Insitu has revealed fresh details about its ongoing work to advance hydrogen fuel-cell propulsion for unmanned aerial vehicles (UAVs). The company said in a 21 March statement that it has successfully completed the first fill test of a liquid hydrogen (LH 2) storage tank designed for its ScanEagle 3 mini-UAV. The trial – which was carried out at Washington State University's Hydrogen Properties for Energy Research (HyPER) laboratory in February – comprised liquid hydrogen fill, pressure, and vapour generation testing. Access the full report here.

DroneShield aims to further exploit AI for C-UAS development, introduces updated products

25 Mar: DroneShield will focus on upgrading its artificial intelligence (AI)-based detection and classification software in the coming years to develop an increasingly flexible approach that reduces reliance on data libraries, company officials told Janes in late March. The Australian company– which specialises in countering potential threats like unmanned aircraft systems (UAS) and even in areas such as signals intelligence (SIGINT) and electronic warfare (EW) – rolled out its first fully machine learning/artificial intelligence (ML/AI)-based software to all existing customers in February as part of its quarterly software update programme. Access the full report here.

Turbulence simulation: New techniques advance US Army research

15 Mar: New US Army Research Office (ARO)-sponsored work could enable armed forces and industry to more accurately simulate turbulence at a lower cost than current methods, holding significant implications for developing helicopters, missiles, and various defence technologies. The Coherent-vorticity-Preserving Large-Eddy Simulation (CvP-LES) was developed by researchers at Purdue University in Indiana, with funding from ARO, part of the US Army Capabilities Development Command's Army Research Laboratory (ARL). Access the full report here.

Analysis: Lockheed Martin's Speed Racer effort about fast design changes for different missions

04 Mar: Lockheed Martin Skunk Works' Speed Racer unmanned flight vehicle digital engineering pilot project is about quickly configuring the vehicle for different missions desired by a customer, according to experts. Lockheed Martin released an image of the Speed Racer on 11 February. The same day, company spokesperson Ananda Costa said that the company was expecting delivery of Technical Directions Inc engines imminently, at which point the company would move into ground testing. Access the full report here.

Boeing's 'Loyal Wingman' UAV makes maiden flight

02 Mar: Boeing Australia has successfully conducted the maiden flight of the 'Loyal Wingman' unmanned aerial vehicle (UAV) it is developing in partnership with the Royal Australian Air Force (RAAF), the company announced on 2 March. The first military aircraft to be designed and manufactured in Australia in more than 50 years flew for an undisclosed time under the supervision of a Boeing test pilot who monitored the aircraft from a ground control station at the Woomera range complex in South Australia. Access the full report here.

Naval Detection

Hitting the sweet spot: Balancing manned and unmanned inputs to boost ASW

24 Mar: Since the advent of submarines, navies have had to account for anti-submarine warfare (ASW) concepts and capabilities. Today, as adversaries of Western navies increasingly recognise a submarine's tactical, operational, and strategic utility, ASW is resurfacing as a core, high-end capability delivering advantages in the underwater domain and more widely at sea. A new factor in the ASW equation are unmanned systems, especially, although not exclusively, unmanned surface vessels (USVs) and unmanned underwater vehicles (UUVs). Access the full report here.

ONR explores USV power-generation concepts

24 Mar: The US Office of Naval Research (ONR) is launching a new science and technology effort aimed at advancing the development of power-generation systems suitable for long range/long endurance unmanned surface vehicles (USVs). Aimed at maturing technologies and techniques at Technology Readiness Level (TRL) 3-4, the Robust Unmanned Platform Power Systems research thrust is aligned to the US Navy's (USN's) interest in developing low cost, high endurance reconfigurable USVs that can accommodate various payloads. Access the full report here.

Magnetic attraction: MAD seeks a comeback for airborne ASW

12 Mar: While airborne anti-submarine warfare (ASW) assets have traditionally relied on active and/or passive acoustics for area search, detection, classification, and localisation, the contribution to be made by other sensors should not be ignored. For example, maritime surveillance radars utilising specialist small target detection modes are capable of picking up raised periscopes or masts, while electronic support measures systems can intercept and direction-find on radar and/or communications transmissions. Access the full report here.

Uncharted waters: NAVSEA steams into a new cyber arena

08 Mar: Red flags concerning long-standing gaps in network security at US Naval Sea Systems Command (NAVSEA) and the wider service raised in 2019 prompted command officials to stand up a new directorate in April 2020 to oversee development of cyber capabilities and contingencies associated with the service's digital transformation efforts. "We are looking hard at everything to do with cyber and shoring up our systems quite a bit," said Vice Admiral Jeffrey Trussler, Deputy Chief of Naval Operations for Information Warfare (N2/N6), during an Intelligence and National Security Alliance-sponsored event in Washington, DC, in January. Access the full report here.

Ends.