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Ladies and gentlemen,



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With these few words, I'm very pleased to welcome you to this second edition of the Conférence Navale de Paris, organized with the support of the French Institute for International Relations. This year we are honored by the presence of the Chiefs of Staff of the U.S., British and Italian Navies, as well as a representative of the Indian Navy.

More than ever, the strategic context is marked by uncertainty and volatility. The disinhibition of our competitors, the assertion of sovereignty and the vast movement towards naval rearmament mean that we must consider naval combat as the starting point for our operational preparation. The challenge is to be ready for more unexpected, more brutal and tougher engagements. To keep the initiative, we need to observe and understand, to discern trends, in short to clear up the "fog of war". That's why we need to stimulate strategic thinking and share our visions. The diversity and quality of the speakers present at this 2024 edition of the Conférence Navale opens up some exciting prospects.

Tomorrow's battles will be fought in coalition, so we need to strengthen our partnerships today. Interoperability is based on connected equipment, on common procedures, but above all on the trust we have in each other. The dialogue we will be having with my counterparts at this conference is a way of building this trust, which is crucial for tomorrow's battles. Moreover, it sends a message to our competitors by demonstrating our ability to discuss and build robust strategic options together.

This year's theme is the role played by the Carrier Strike Group in the current context. This tool gives us an unprecedented ability to project power by taking advantage of the unrivaled freedom of the high seas. In this way, it sets the navies equipped with it apart. An armed aircraft taking off at night, far from the coast, striking a target on land is cutting-edge know-how.

This is an ace in our hand. Faced with the growing contestation of maritime space, the aircraft carrier and its carrier battle group are also the tools of superiority in naval combat. In a tougher and more uncertain strategic context, we need to share and enrich our thinking to keep the initiative and win together.

Admiral Nicolas Vaujour
Chief of the French Navy



FOREWORD

Agenda

(ALL LISTED TIMES ARE IN UTC+1)

10:30 - 11:00	Arrival and registration at Ifri (27 rue de la Procession, 75015 Paris)
11:00 - 11:35	Welcome Remarks by Dr. Thomas Gomart , <i>Director, Ifri</i> , and General Thierry Burkhard , <i>French Chief of Defense</i>
11:35 - 13:00	SESSION 1 Future Challenges, Key priorities and Prospects for Navies CHAIR: Dr. Thomas Gomart , <i>Director, Ifri</i> SPEAKERS: Admiral Nicolas Vaujour , <i>Chief of Staff of the French Navy</i> Admiral Enrico Credendino , <i>Capo di Stato Maggiore, Marina Militare</i> Admiral Lisa Franchetti , <i>Chief of Naval Operations, U.S. Navy</i> Admiral Sir Ben Key , <i>First Sea Lord, Royal Navy</i> Vice-Admiral Rajesh Pendharkar , <i>Eastern Naval Command, Indian Navy</i>
13:00 - 14:00	Lunch Break
14:00 - 15:30	SESSION 2 Ensuring Access on Deployed Operations CHAIR: Dr. Alessio Patalano , <i>Professor of War & Strategy in East Asia, King's College London</i> SPEAKERS: Vice-Admiral (ret.) Pradeep Chauhan , <i>Director General, National Maritime Foundation</i> Kelly Grieco , <i>Senior Fellow, Henry L. Stimson Center</i> Alessandro Marrone , <i>Director of the Defense Program, Istituto Affari Internazionali</i> Dr. Élie Tenenbaum , <i>Director of the Security Studies Center, Ifri</i>
15:30 - 15:45	Coffee Break
15:45 - 17:15	SESSION 3 Challenges for CSGs in Naval Warfare CHAIR: Héloïse Fayet , <i>Research Fellow, Security Studies Center, Ifri</i> SPEAKERS: Rear-Admiral Jacques Mallard , <i>COM FRSTRIKEFOR, Marine nationale</i> Rear-Admiral Giacinto Sciandra , <i>COM ITMARFOR, Marina Militare</i> Brent Sadler , <i>Senior Research Fellow for Naval Warfare, Heritage Foundation</i> Emma Salisbury , <i>Associate Researcher, Council on Geostrategy</i>
17:15 - 17:45	Conclusion by Jean-Yves Le Drian , <i>former French Minister of the Armed Forces and Foreign Affairs</i>
17:45 - 17:55	Presentation of the "Admiral Castex" prize , <i>by Mr. Thierry de Montbrial, President of Ifri, and Admiral Nicolas Vaujour, CEMM</i>
17:55 - 18:00	Closing by Thierry de Montbrial , <i>President, Ifri</i>

WELCOME REMARKS



**General
Thierry Burkhard**

has been the French Chief of Defense since July 2021. He has a professional background focused on operational engagement. He began his career with the 2nd airborne regiment of the Foreign Legion in Calvi (Corsica) and took command of the 13th demi-brigade of the Foreign Legion in Djibouti from 2008 to 2010. After having been communications advisor to the Chief of Defense from 2010 to 2013, he was appointed advisor to the intelligence coordinator to the President of the Republic. Returning to the Joint Operations Center in 2015 as head of operational management, he took command of this center in 2017. He was appointed chief of staff of the French army in 2019, before being appointed Chief of Defense Staff in July 2021.



Dr. Thomas Gomart

has been the Director of the French Institute of International Relations (Ifri) since 2015. He is a member of the Institute of Advanced Studies in National Defence's (IHEDN) scientific committee and on the editorial board of the French journals *Politique étrangère*, *Revue des deux mondes*, and *Études*. Thomas Gomart was a member of the French Ministry of Armed Forces' strategic review committee for its Strategic Review of Defence and National Security 2017. He has published extensively on Russia, digital issues, think tanks, and geopolitical risk. Thomas Gomart's most recent book is *L'accélération de l'histoire - Les nœuds géostratégiques d'un monde hors de contrôle* (Tallandier, January 2024), and he has also authored *Les ambitions inavouées : Ce que préparent les grandes puissances* (Tallandier, 2023), *L'Affolement du monde* (Tallandier, 2019) and *Guerres invisibles* (Tallandier, 2021). He received his EMBA from the Hautes Études Commerciales de Paris and his PhD from the Pantheon-Sorbonne University. Thomas Gomart has been awarded the rank of Knight of the National Order of Merit.

PLENARY SESSION 1

Future Challenges, Key priorities and Prospects for Navies

CHAIR:

Dr. Thomas Gomart
Director, Ifri



Admiral Nicolas Vaujour

N.V. was appointed Chief of Staff of the French Navy in September 2023. During his career, he took command of the air defense frigate Chevalier Paul in July 2012. In early 2013, he was deployed to the Indian Ocean and integrated with the American Carrier Strike Group. Following this, in July 2015, he joined the Defence Staff as the officer responsible for operational coherence and capability development in combat operations. In August 2017, he was appointed Deputy Commander of the French Maritime Rapid Reaction Force (DCOM FRMARFOR). Promoted to Rear Admiral in April 2018, he assumed the responsibilities of Deputy Chief of Staff for Naval Air Operations at the Naval Staff. He was appointed Admiral in charge of international relations for the French Navy in 2020 and Chief of Staff for "Operations" of the Armed Forces in 2021, overseeing operations conducted by French forces, both within France and abroad.



Admiral Enrico Credendino

E.C. has held the position of Chief of the Italian Navy since November 2021. He was promoted to the rank of Rear Admiral (LH) in 2011, and assumed various responsibilities, including Deputy Commander of the Italian Front Line Naval Forces and Deputy Commander of the Italian Maritime Forces. He also served as Commander of the Spanish/Italian Amphibious Force and Commander of the Italian Naval Task Group. In 2012, he was designated as the Force Commander for the EU Naval Force's counter-piracy mission, EUNAVFOR ATALANTA. From 2013 to 2015, he held the position of Head of the Plans, Operations, and Maritime Strategy Department at the Italian Navy General Staff. From 2015 to 2020, he served as the Operation Commander of EUNAVFOR MED Operation Sophia. From 2020 to 2021, he assumed the role of Commander of the Italian Navy Schools, followed by his appointment as Commander in Chief Naval Fleet. His career progression included promotions to the ranks of Rear Admiral (UH) in 2014, and Vice Admiral in 2019.



Admiral Lisa Franchetti

L.F. has been Chief of Naval Operations (CNO) since November 2023. She was commissioned from Northwestern University's Naval Reserve Officer Training Corps in 1985. In various roles at sea, she served on USS Shenandoah, USS Monongahela, USS Moosbrugger, USS Stout, and commanded USS Ross and DESRON-21. Ashore, she held diverse positions, including military assistant to the Secretary of the Navy. She later served as Commander, U.S. Naval Forces Korea; Commander, Carrier Strike Group 9 and 15; Chief of Staff, Strategy, Plans and Policy Joint Staff (J5); and Commander, U.S. 6th Fleet/Deputy Commander, U.S. Naval Forces Europe and U.S. Naval Forces Africa/Commander, Naval Striking and Support Forces, NATO. Additionally, she served as Deputy Chief of Naval operations for Warfighting Development (N7), Director for Strategy, Plans and Policy, Joint Staff (J5). She held the role of Vice Chief of Naval Operations before becoming CNO.



Admiral Sir Ben Key KCB CBE

B.K. has been First Sea Lord and Chief of Naval Staff since November 2021. He joined the Royal Navy in 1984 as a University Cadet. He qualified as both helicopter aircrew and as a Principal Warfare Officer. He has commanded four warships: the mine hunter HMS Sandown, the frigates HMS Iron Duke and HMS Lancaster, and the aircraft carrier HMS Illustrious. Shore appointments have included Resources and Plans in the Ministry of Defence, UK's Permanent Joint HQ in Iraq, and Principal Staff Officer to the Chief of Defence Staff. From April 2013 to July 2015, he was Flag Officer Sea Training. Promoted to Vice Admiral in February 2016, he was the Royal Navy's Fleet Commander from then until March 2019. He then served as the Chief of Joint Operations. He was selected in October 2021 to assume the office of First Sea Lord and Chief of Naval Staff.



Vice-Admiral Rajesh Pendharkar

R.P. assumed the role of Flag Officer Commanding-in-Chief, Eastern Naval Command (ENC) in August 2023. In the Indian Navy since 1987, he is an alumnus of the National Defence Academy. He is a graduate from the Defence Services Staff College in Wellington, Naval War College in Karanja, and Naval Command College in Newport, Rhode Island (U.S.). He holds a master's degree in Defence and Strategic Studies. He commanded three warships, including the Missile Corvette INS Kora, Stealth Frigate INS Shivalik, and the Aircraft Carrier INS Viraat. Upon promotion to the rank of Rear Admiral, he assumed the role of Assistant Chief of Integrated Defence Staff at Integrated Defence Staff (IDS), New Delhi, and Chief Staff Officer (Operations) at Western Naval Command. He also served as Flag Officer Commanding Maharashtra Naval Area, Flag Officer Sea Training, Director General of Naval Operations at IHQMoD (Navy) and as Deputy Chief of Integrated Defence Staff (Operations) in New Delhi.



PLENARY SESSION 2

Ensuring Access on Deployed Operations

01. Dr. Alessio Patalano is a Professor of War & Strategy in East Asia at King's College London (KCL) where he specializes in maritime strategy and doctrine, Japanese military history and strategy, and East Asian security. At KCL, he is the Co-Director of the Centre for Grand Strategy. He is a Fellow of the Royal Historical Society (FRHistS), and is affiliated with the following think tanks: Policy Exchange, Royal United Services Institute (RUSI), and the Council on Geostrategy. In 2022, he became the first specialist advisor on the Indo-Pacific to the Foreign Affairs Committee in the UK Parliament. In 2023, he was also the first academic to be awarded a Commendation of the Ambassador of Japan for outstanding contribution to the advancement of UK-Japan ties in defense and security. His latest book, edited with James Russell and Catherine Grant, is *The New Age of Naval Power in the Indo Pacific: Strategy, Order, and Regional Security* (Georgetown University Press, 2023).

02. Vice-Admiral (ret.) Pradeep Chauhan is the Director-General of the National Maritime Foundation (NMF). As a maritime practitioner, his experience stems from a four-decade-long career in the Executive Branch of the Indian Navy. As Rear Admiral, he was the Navy's first Assistant Chief of the Naval Staff (Foreign Cooperation & Intelligence), where he conceptualized and executed the Indian Ocean Naval Symposium (IONS). He has been Chief of Staff of the Western Naval Command; and was, in his last naval appointment before retirement, the Commandant of the Indian Naval Academy (Ezhimala). He is on the visiting faculty of the higher-command establishments of all three of India's defence services and tri-service establishments, such as the College of Defence Management, Hyderabad, and the National Defence College, New Delhi. He has been advising the Indian Government through his interaction with the Integrated Headquarters of the Ministry of Defence (Navy), the Ministry of External Affairs, and the National Security Council Secretariat.

03. Kelly A. Grieco is a Senior Fellow with the Reimagining US Grand Strategy Program at the Stimson Center, where her work focuses on US grand strategy and defense policy, addressing questions about US foreign policy, international security, military alliances, and the future of war. She has expertise in US military alliances and the security architectures of the Indo-Pacific and Europe, as well as current and emerging airpower strategies and capabilities. She is also an Adjunct Associate Professor in the Center for Security Studies at Georgetown University and a Nonresident Fellow at the Brute Krulak Center of the Marine Corps University. Her work has appeared in a range of outlets, including *Defense*, *Defense News*, *The Diplomat*, *Foreign Policy*, *International Politics*, *Los Angeles Times*, *Parameters*, *Strategic Studies Quarterly*, *The National Interest*, and *War on the Rocks*.

04. Alessandro Marrone is the Head of the Istituto Affari Internazionali (IAI) Defence Programme. He has been working at IAI since 2007, and currently manages research projects and publications related to European and transatlantic security as well as Italy's defence policy. Since 2018, he is also a Professor at the Istituto Superiore di Stato Maggiore Interforze of the Italian Ministry of Defence, after four years of teaching at the University of Perugia. He is a mentor at the NATO Defence College, and since 2016 is a member of the Scientific Board of the Armament Industry European Research Group (ARES Group). He is a member of the Editorial Board of IAI web-magazine *Affari Internazionali* and collaborates with several Italian magazines.

05. Dr. Élie Tenenbaum is the Director of Ifri's Security Studies Center. A PhD graduate in History (2015) and a Sciences Po graduate (2010), he was a Visiting Fellow at Columbia University. He has taught international security at Sciences Po and the history of international relations at the University of Lorraine. Élie Tenenbaum works in particular on issues of irregular warfare, the fight against terrorism and hybrid threats as well as on French defense policy and military operations. He is the author of numerous articles and books on history and strategy, including his latest book, co-authored with Marc Hecker, *La guerre de vingt ans: djihadisme et contre-terrorisme au XXI^e siècle* (The Twenty Years' War: Jihadism and Counterterrorism in the XXIst Century), published by Robert Laffont in 2021.

CHAIR:

Dr. Alessio Patalano
Professor of War & Strategy



PLENARY SESSION 3

Challenges for CSGs in Naval Warfare

01. Héloïse Fayet is a Research Fellow at Ifri's Security Studies Center and coordinator of its Deterrence & Proliferation research program. Her work focuses on Nuclear Weapons States' doctrines, strategic risk reduction, and articulation between conventional and nuclear forces. She also writes about the geopolitics of the Middle East, the Mediterranean and the Red Sea, and new methods for strategic foresight. She is a member of La Pérouse network of naval researchers, and a regular speaker for conferences and training courses in France and abroad. Before joining Ifri, she worked for several years at the French ministry of armed forces as an analyst on the Middle East. She is a graduate of Sciences Po Paris.

02. Rear-Admiral (UH) Giacinto Sciandra was appointed head of the Second Naval Division (COMDINAV DUE), commander of the Italian Maritime Forces (COMITMARFOR), and commander of the Italian Carrier Strike Group (CSG) on January 27, 2023. The Second Naval Division of the Italian Navy, the largest Italian fleet, consists of 19 ships and 3,500 personnel. After serving in various onboard roles, he was appointed as the commander of the frigate "Zeffiro" in 2008, the flagship of the SNMG2 Rapid Reaction Force engaged in the "NATO Active Endeavour" operation. From 2014 to 2015, he commanded the destroyer "Caio Duilio" and notably participated in the "Mare Sicuro" operation in the central Mediterranean. From 2015 to 2018, he worked at the Naval Personnel Employment Directorate as an officer manager. He then became the Defense Attaché at the Italian Embassy in France from 2018 to 2021 before being appointed Chief of Staff of the logistics command in Naples from 2021 to 2023.

03. Rear-Admiral Jacques Mallard has been in command of the FRSTRIKEFOR since August 1st, 2023. He earned his pilot's badge in 1998 after qualifying for carrier landings onboard USS John F Kennedy with a TA4 Skyhawk fighter jet. He was then assigned to the 11F squadron at Landivisiau as a Super Etendard pilot. He participated in the sea trials of the aircraft carrier "Charles de Gaulle" and participated in the very first operational missions over Afghanistan in December 2001 with the 17F squadron. He then took command of this squadron in 2007. In 2010, he joined the Carrier Strike Group staff and participated in Operation HARMATTAN, the French side of Operation Unified Protector. He was appointed as the "Charles de Gaulle" operational officer in July 2013 and took part in two missions in the Arabian Gulf in support of operations CHAMMAL and Inherent Resolve. He took command of the frigate "Guépratte" in June 2017 and participated in the CHAMMAL mission.

04. Brent Sadler joined the Heritage Foundation after a 26-year Navy career with numerous operational tours on nuclear powered submarines in the Pacific, personal staffs of senior Defense Department leaders, and as a military diplomat in Asia. As a senior research fellow, his focus is on maritime security and the technologies shaping our future maritime forces, especially the Navy. In 2023, he authored a book detailing a new naval statecraft in *U.S. Naval Power in the 21st Century*.

05. Emma Salisbury is a PhD candidate at Birkbeck, University of London, with research focusing on the military-industrial complex. She is an associate fellow at the Council on Geostrategy and at the Ministry of Defence's Development, Concepts, and Doctrine Centre, a senior staffer for a Member of Parliament, and an associate editor at War on the Rocks. She writes regularly on military technology, procurement, and the defence industrial base, with a focus on naval issues.

CHAIR:

Héloïse Fayet

Research Fellow,
Security Studies Center, Ifri



CONCLUDING REMARKS

Jean-Yves Le Drian has been President of the French Agency for the Development of AIUla (AFALULA) since July 26, 2023. He also holds the position of personal representative of the President of the French Republic in Lebanon since June 8, 2023. He has a rich history of ministerial functions, having been Minister for Europe and Foreign Affairs from 2017 to 2022, Minister of Defense from April 2014 to May 2017, then from May 2012 to March 2014. He was also previously a minister as deputy for Morbihan from 1978 to 1991 and from 1997 to 2007, mayor of Lorient from 1981 to 1998, Secretary of State for the Sea from 1991 to 1992 and president of the regional council of Brittany from 2004 to 2012.



IFRI FOOD-FOR-THOUGHT PAPER



Jérémy Bachelier
military fellow at Ifri's
Security Studies Center



Dr. Élie Tenenbaum
Director of Ifri's
Security Studies Center

The continuing relevance of **Carrier Strike Groups** in the 21st Century

As strategic competition among great powers gains momentum on all sides, the world is shifting toward a more unstable, lethal and contested environment. Everywhere, the rules-based international order is being challenged. The maritime domain is no exception to this trend and even lies at the forefront of such a transformation. The sea is evolving fast from what used to be a sanctuary, safe for free trade and communication, into a realm consistently challenged by proliferating anti-access and sea denial capabilities and plagued with negligent behaviors and subversive fait-accomplis strategies.

Since the Second World War, the Carrier Strike Group (CSG) has been the most central asset in achieving naval supremacy, better known as "command of the sea". It not only represents the main capability to strike land from the sea but is also a key tool to assert sea control through naval combat; performing the most crucial missions of surface warfare: command and control, scouting, maneuver and strike. CSGs are also the multi-domain task forces par excellence, connecting surface fleets to air, land, submarine, space, cyber and even information domains in mutually strengthening collaborative warfighting.

With great capability comes great responsibility: the strategic value of CSGs

Aircraft carriers and the naval battle groups formed around them are not just mighty military assets. As a modern fleet's capital warship, they convey a strong strategic and even political signal. Because they come at such a high cost and combine so many demanding skills, carriers are also very scarce in quantity, possessed by very few nations worldwide.

With nuclear submarines, aircraft carriers are among the most complex platforms in the world, integrating a wide array of advanced command, control and communication infrastructure, radar systems, and defensive capabilities. High-end propulsion systems, potentially nuclear-powered, are required to set in motion mammoth ships of 40,000 to over 100,000 tons. As embarked combat aircrafts get more complex, they also become heavier, requiring cutting-edge technologies in aircraft launch and recovery systems such as new Electromagnetic Aircraft Launch Systems (EMALS), offering improved performance over previous systems, as Catapult Takeoff Barrier Arrested Recovery (CATOBAR) or Short Takeoff (STOBAR) systems.





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Beyond the carrier itself, the whole battle group must integrate air defense and anti-submarine warfare assets, as well as naval combat and hypersonic missile strike capabilities. The complexity of coordinating such an already comprehensive surface and underwater fleet with a great variety of aircrafts (fighter and attack, maritime patrol, airborne early warning, search and rescue, etc.) adds another layer to the challenge. The need for skilled personnel, including pilots, deck crew, and maintenance staff, implies extensive training programs and ongoing education. These operating costs make CSGs expensive assets not only during their construction but also throughout their service life.

Because carriers are such exclusive and unique naval assets, they also act as aggregators for military cooperation with other navies. CSGs represent the backbone of modern fleets, enabling support for training and skill development for allied and partner navies lacking such a platform. Therefore, CSGs provide unparalleled opportunities to build trust and enhance the interoperability of information and communication networks and equipment, as well as tactical procedures and doctrine, in a dynamic and realistic environment.

Beyond their role in interallied cooperation, aircraft carriers and associated CSGs also play a crucial role in strategic signaling by serving as instruments of reassurance to allies and deterrence to potential adversaries. With their formidable capabilities and flexibility, the deployment of Carrier Strike Groups sends a clear message of commitment and support to allied nations. The presence of an aircraft carrier in a region signifies a tangible demonstration of both military power and political resolve, indicating that a nation is prepared to defend shared interests and uphold collective security commitments. This deterrence capability may even include a nuclear dimension, at least as far as France is concerned, with the nuclear naval aviation force (Force Aéronavale Nucléaire or FANu) capable of carrying supersonic cruise missiles with nuclear warheads onboard the Charles de Gaulle.

Moreover, the strategic mobility and firepower of CSGs allow them to deploy anywhere in international waters without relying on time-consuming and uncertain diplomatic negotiations to secure access to foreign airbases.

For instance, in March 2003, Turkey refused to allow the U.S. Air Force to use its air bases to deliver troops and supplies into northern Iraq, necessitating a dangerous drop of 1,000 paratroopers of the 173rd Airborne Brigade to capture the Bashur airfield in Iraqi Kurdistan. Although sea-based airpower is ill-suited to long-range, strategic and protracted strike campaigns, recent operational history has demonstrated the relevance of CSGs in “first entry” operations, especially during emergency situations in distant theaters as well as the “last to leave” role to facilitate a secure theater disengagement.

Ultimately, the aircraft carrier makes a significant contribution to the joint military power of nations possessing such a capacity, owed to its versatility and ability to project air power over extensive theaters of operations.



CSGs in a more lethal environment



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Throughout history, CSGs have consistently demonstrated their adaptability. Recent operations in the Mediterranean Sea, Arabian Gulf, and Indian Ocean have highlighted their effectiveness in facilitating a broad spectrum of naval operations. These encompass a wide array of tasks, including land attack, surface warfare, integrated air and missile defense, Anti-Submarine Warfare, Amphibious Operations, Maritime

Interception Operations, Protection of Shipping or Reconnaissance.

Over the last three decades, as Western militaries enjoyed overall “command of the commons”, especially the high seas as operational sanctuary, CSGs have been mostly used to project power with minimal risk. Depending on the carrier size and scope, the largest carriers can generate up to 100

combat sorties per day and produce operational-level effects through deep attacks on enemy decision centers and command structures. It can also interdict communications and supply networks as well as provide air support to friendly ground forces involved in land operations. However, in recent years, the vulnerability of CSGs has emerged as an increasingly worrying and pressing issue. Analysts and

military strategists have underscored the challenges posed by Anti-Access/Area Denial (A2/AD) strategies based on the widespread diffusion of both (mostly space-based) sensors and ever more performant long-range missile capabilities.

As dangerous as this threat can be, one should not jump to the conclusion that CSGs are now totally exposed. Finding and fixing a dynamic

target moving at 15 knots (650 km per day) within the vast maritime domain presents a formidable challenge. The operational complexity stems from interwoven factors such as the CSG’s rapid and unpredictable movements, and limitations in maritime sensor capabilities. While surveillance satellites and sea- or land-based sensors have expanded qualitatively and quantitatively at a rapid pace, processing the resulting mass of data

is still a huge and complex task. To be sure, information management and Maritime domain awareness (MDA) are also making impressive progress, especially as far as maritime security is concerned. But the sea is far from becoming a transparent domain for tracking a military asset.

In addition to the challenges of acquiring a moving target, a critical facet of A2/AD strategies involves engaging CSGs at extended ranges by deploying technologically advanced land-based anti-ship missiles, including both ballistic (ASBM) and cruise missiles. The resulting salvo competition pits carrier-based defensive systems against the precision and range of these advanced missiles. Land-based A2/AD platforms benefit from geographic advantages, strategically positioned on fortified islands or coastal regions, enabling the launch of salvos before withdrawing to protected locations. The relentless advancement and proliferation of long-range missile technologies intensify the risk of overwhelming carrier defenses, necessitating continuous innovation in defensive countermeasures and tactical responses to effectively address the escalating threat landscape posed by A2/AD capabilities.

In the face of these A2/AD challenges, CSGs persist as crucial assets, propelled by advancements in defensive technologies. Early



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warning systems, electronic warfare capabilities, and refined evasive tactics collectively augment CSG survivability. Extended detection ranges from radar and sensor innovations afford critical response time, while sophisticated electronic warfare systems disrupt incoming missile guidance, adding complexity to potential threats. Dynamic evasive maneuvers, guided by real-time threat assessments, further confound targeting strategies, enhancing the overall defensive posture of CSGs. Simultaneously, the imperative for offensive counter-A2/AD solutions fuels investments in technologies to disrupt land-based interdiction bubbles. Kinetic means, including advanced missile defense systems and next-gen aircraft, contribute to the offensive capabilities of CSGs. Non-kinetic methods, such as electronic warfare and cyber operations, seamlessly integrate into naval strategies. This comprehensive approach underscores the adaptability of CSGs, affirming their resilience and sustained relevance in contemporary naval warfare.

Finally, the integration of all-domain capabilities may prove to be the real game changer, as CSGs extend their influence beyond traditional air-sea and sea-land operations. In the future, CSGs will assume a pivotal role in the sea-space nexus, contributing significantly to Intelligence, Surveillance, and Reconnaissance (ISR), Positioning,

Navigation, and Timing (PNT), and Satellite Communication (SATCOM) functions. Additionally, CSGs will play a crucial part in sea-cyber operations, reflecting the growing interconnectedness of maritime and cyber domains.

CONCLUSION

CSGs remain indispensable assets for nations striving to safeguard their interests, uphold regional and global security, and guarantee freedom of action in contested or hostile arenas. Their adaptability, prowess in power projection, and their ability to carry a strategic signal make them irreplaceable capabilities for future conflicts. The escalated risk of high-intensity confrontations at sea will confirm CSG's relevancy in the years ahead.

In times of uncertainty, naval forces must once more explore uncharted domains, challenge entrenched conventions, lead the way in innovative methods, and leverage technological advancements.

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