Securing the Seas: Examining Changing Saudi & Emirati Naval Capabilities
Over the past decade, the Gulf Cooperation Council (GCC) countries have significantly expanded their navies through increased investments and prioritization by national leaders. This transformation marks a noteworthy departure from the Gulf navies’ previously low-profile status. The increased focus on the maritime domain demonstrated by the GCC states reflects the realization that secure sea lines of communication—the primary channel for oil and gas exports—are essential to their economic survival. However, these waterways have come under increasing threat due to disruptions from around the region, and particularly from Iran, the Houthis, and from piracy around the Horn of Africa. Since 2021, for example, Iran has harassed, attacked, or seized about 20 merchant vessels—a significant increase from previous years, while the Houthis have launched dozens of attacks on international shipping with anti-ship missiles and various types of unmanned systems, highlighting the need for the GCC states to develop versatile, adaptable maritime strategies and improve their naval force posture in the Gulf.1

The following report seeks to provide an assessment of the naval capabilities of the Royal Saudi Naval Forces (RSNF) and the UAE Navy (UAEN). These two countries have been chosen because they are arguably the two most influential Arab Gulf states and have the largest defense budgets within the GCC. This report will also seek to show how varying strategic needs and structural limitations have compelled these two nations to follow distinct paths in the development of their naval capabilities.

The first section of this report examines the case of Saudi Arabia, beginning with an assessment of the Kingdom’s strategic interests in the maritime domain and the specific constraints that limit the policy options available to its leaders. Among its most important interests are the protection of offshore oil and gas facilities and port infrastructure, the maintenance of a secure environment in the Red Sea to facilitate numerous developmental projects, the deterrence of Iranian aggression, and the assertion of regional leadership. Manpower is less of a constraint for the Kingdom than its smaller neighbors; instead, Riyadh’s primary challenge stems from a relatively lower availability of expertise, training opportunities, and technical know-how among its sailors, and insufficient shipbuilding infrastructure. Consequently, Saudi leaders have found it easier to augment its navy with additional vessels, rather than focusing on other qualitative factors underpinning naval capability. Following an exploration of how Riyadh has responded to the evolving regional dynamics by prioritizing mass and numerical strength, the report highlights four qualitative factors that have received less attention. These consist of two technological force multipliers: modern vessels and expertise in unmanned systems; and two key enablers of naval capability: shipbuilding capacity and the availability of training opportunities, which are necessary for the cultivation of highly skilled naval personnel.

After exploring the Saudi case, the report will turn to the UAE. Following the same structure, it first highlights the UAE’s relevant strategic interests and the structural constraints which shaped the development of the UAEN. The UAE’s position as a world-class logistics hub, its vulnerability to Iranian threats, its pursuit of strategic autonomy, and its regional foreign policy ambitions all shape the UAEN’s course of development. The report then examines how the federation responded to such challenges by prioritizing four major qualitative factors, given its limited manpower reserves. Abu Dhabi has invested significant sums of money and energy into modernizing its vessels, and the UAE has developed a significant domestic shipbuilding capacity, which provides it with a unique sovereign capability. Moreover, several Emirati companies and

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startups have been developing Unmanned Surface Vehicles (USVs), and the country now boasts at least three training institutions for the navy and a dozen commercial academies, seven of which provide courses that encompass military or security components. The expertise necessary to develop a domestic shipbuilding industry and to establish such training institutions has been more readily available in the UAE due to its centrality as a maritime hub, a key difference with its Saudi counterpart. On the other hand, however, manpower constraints have curtailed the UAEN’s ability to field a greater number of larger naval platforms, limiting its raw strength.

The report concludes by highlighting how Riyadh’s and Abu Dhabi’s differing priorities and structural constraints have shaped their naval strategies. While Saudi Arabia has strengthened its naval capability primarily through the acquisition of larger and more numerous vessels, the UAE’s smaller size but better access to key expertise has necessitated a greater emphasis on the peripheral factors that also underpin a country’s naval capabilities. The report will also reflect on the ways that future geopolitical developments may reshape these fluid national maritime strategies.

**Recommendations**

- **Do Not Ignore Other Measures of Naval Capability:** It is imperative not to overlook the multifaceted factors that contribute to a nation’s naval capabilities. Beyond the readily quantifiable metrics such as tonnage, platform count, and personnel, less obvious yet equally vital factors—including platform age, domestic shipbuilding capacity, technological expertise, and training opportunities—also underpin naval effectiveness.

- **Consider Interests and Constraints:** A comprehensive understanding of a country’s naval development requires an examination of its strategic interests, including factors like security threats and regional aspirations. Equally important are a country’s structural constraints, including the availability of manpower, requisite expertise, and geographical considerations, which significantly shape the trajectory of naval forces.

- **Develop Domestic Shipbuilding and Ship Maintenance Capabilities:** Establishing a robust domestic shipbuilding industry is an expensive endeavor, but it may also provide numerous advantages. These include a reduced reliance on foreign suppliers and the potential to become a security provider by exporting or donating vessels. While it may be unfeasible to establish shipyards capable of building major surface combatants, a focus on patrol craft, offshore patrol vessels, USVs, and offering MRO services seems much more realistic and could be tremendously useful. Partnering with international shipbuilding companies could help accelerate this process.

- **Prioritize Investments in Training and Modernization:** Saudi Arabia should prioritize investment in maritime and naval training institutions, and should continue to phase out older vessels to ensure a modern, capable, and effective naval force.

- **Embrace Unmanned Technology:** While both the UAE and Saudi Arabia stand to gain from embracing these technologies, the UAE, owing to its relatively limited human resources, has more reasons to focus its energy in this domain. Unmanned surface vessels offer significant advantages in terms of increased operational capabilities, reduced manpower requirements, and improved efficiency. This may be facilitated by the continued investment in R&D centers focused on such technologies, as well as by strengthening Abu Dhabi’s partnership with NAVCENT’s Task Force 59.
As the GCC monarchies seek to wean their economies off of hydrocarbon exports, the maritime sea lines of communication that were once the primary conduit channeling oil to the rest of the world have now also become central to their economic diversification strategies. These same waterways have been threatened by a variety of hostile actors, including pirates from multiple nations, the Houthis in Yemen, and Iran, which has continued to harass and attack merchant vessels using fast attack craft, unmanned surface vessels (USVs), and missiles. In response, the Gulf Arab states have welcomed the establishment of several major international naval coalitions tasked with patrolling these waters, including the Combined Maritime Forces, the International Maritime Security Construct, and the European-led Maritime Awareness in the Strait of Hormuz.²

Most GCC states have invested resources and effort into strengthening their navies, which have witnessed an unprecedented expansion during the past decade. Assessing naval prowess, however, is more complex than simply evaluating the sheer number of platforms or personnel. This report embarks on an in-depth exploration of the navies of Saudi Arabia and the UAE from a quantitative and qualitative perspective. These are the Arab world’s two largest economies and have been among the most active countries in the region since the 2011 Arab Spring uprisings. These two Arab monarchies also share some motivations for expanding their navies, such as the perception of waning American commitment to the region, a mounting Iranian threat at sea, and the maritime threats arising from the conflict in Yemen. Furthermore, both Saudi Arabia and the UAE have used their navies in Yemen, an active conflict zone. However, their divergent strategic needs and structural constraints shed light on why they have prioritized different facets in the development of their naval capabilities.

Riyadh, with its extended coastline to safeguard, needs a larger fleet of vessels to patrol its littoral waters and protect the nation’s borders. Blessed with a considerably more substantial pool of available manpower relative to the UAE, Saudi Arabia faces fewer constraints in terms of manning its newly acquired naval assets, assuming sufficient investment in the training of new sailors. While this approach may not be efficient in the long term, the Kingdom can afford to bolster its naval capability by procuring additional ships. This approach—seeking simply to enhance naval power by expanding the number of ships—unfortunately diverts attention from the broader spectrum of qualitative factors that also underpin a navy’s effectiveness, which include two key enablers and two technological force multipliers.

² The Combined Maritime Forces is a multinational maritime partnership of 39 nations established in 2001 and headquartered in Bahrain with US Naval Forces Central Command. It focuses on maritime security, counter-piracy, and training in the waters around the Arabian Peninsula. The International Maritime Security Construct is another maritime partnership of 12 nations established in 2019 and headquartered in Bahrain, which aims to provide reassurance to merchant shipping in and around the Strait of Hormuz and the Bab el Mandeb Strait. The European Maritime Awareness in the Strait of Hormuz is a third maritime partnership of 9 European countries established in 2020 and headquartered in Abu Dhabi. Its goal is to ensure a safe navigation environment, contribute to de-escalation and facilitate an inclusive, regional dialogue in the Strait of Hormuz.
The UAE has traditionally accorded greater significance to maritime security than its larger neighbor, but Abu Dhabi’s calculus has changed. Beyond protecting its territorial waters and offshore oil and gas installations, the safety of merchant shipping within and around the federation has assumed paramount importance for Emirati leaders, as reflected in the newly-released National Defence Strategy of the UAE. The country's economy hinges substantially on its ports and its role as a global logistics hub, with the bulk of goods arriving by ship. The UAE has also faced the challenge of projecting power into Yemen, far from its mainland. In a perfect world, it would have been sufficient to expand the size of the UAEN to meet all of these challenges, adopting a strategy similar to Saudi Arabia's. However, the federation’s significant manpower constraints have made quantitative expansion of the UAEN extremely difficult, compelling Emirati leaders to seek alternatives. Given that embarking on a major shipbuilding campaign is not sustainable, the UAE has instead shifted its focus towards ensuring that its naval assets remain modern and combat-ready. Additionally, the exploration of new technologies, including unmanned systems, has assumed prominence as methods of alleviating manpower limitations. In summary, this report seeks to analyze how divergent strategic interests and structural constraints have steered the distinct development trajectories of the RSNF and the UAEN.

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3 Emirati port operators DP World and AD Ports Group operate dozens of ports across the globe.
Saudi Arabia

Strategic Interests and Constraints Shaping the Development of Saudi Naval Capabilities

For much of Saudi Arabia’s modern history, large sections of the nation’s economy and society never experienced a great degree of exposure to the sea. For this reason, the Saudi maritime sector has historically remained relatively underdeveloped. The House of Saud, the ruling family of the modern state of Saudi Arabia, comes from the Najd, a desert region that sits at the core of the Kingdom, far away from either the Red Sea or the Gulf. The Kingdom’s capital, Riyadh—where foreign and security policy decision-making has been concentrated since its founding—is 400 km away from the coast, giving discussions of naval security a certain level of abstraction.

The location of the state’s administrative center notwithstanding, the Kingdom’s vast expanses of land and its shared borders with seven neighboring states—some of which have seen violent clashes in the recent past—seem to have contributed to a land-centric mindset among Saudi elites. Saudi Arabia’s investment in more serious naval capabilities was further disincentivized by the U.S. security umbrella. Other factors, such as a low level of naval ethos, poor maritime threat perception, a lack of technical know-how, and the navy’s lack of prestige also impeded the development of the Saudi navy.4

More recently, however, a series of regional developments have led to a reassessment of the importance of maritime forces, leading to increased investments in the Kingdom’s naval capabilities. On the one hand, Saudi Arabia recognized the imperative of preserving a stable and secure environment that allows the Kingdom to implement its Vision 2030 economic diversification plan. This scheme, in which the Red Sea coastal development projects and Saudi Arabia’s expanding ports play an important role, is critical to the Kingdom’s transition to a post-oil future. Iranian aggression at sea, and the improved capabilities of both Iran and its proxies—particularly the Houthis—, who threaten the key Straits of Hormuz and Bab el-Mandeb, have darkened Riyadh’s maritime threat perception.5 Other factors include the perception of a decreasing U.S. commitment to the Kingdom’s defense6 and Saudi Arabia’s desire to assert regional leadership in the Gulf and the Red Sea.

Collectively, these factors—in conjunction with the Kingdom’s geography, structural constraints such as a shortage of training opportunities and of shipbuilding infrastructure, and recent foreign policy adventures—have shaped Saudi Arabia’s decision to strengthen its navy by placing more hulls in the water. With a larger reservoir of manpower, adding more vessels has proven to be an easier path to greater power projection than the relative complexity of improving other key enablers and force multipliers. An increase in the number of naval platforms serves several purposes. First, it facilitates the coverage of Saudi Arabia’s two long coastlines in the Gulf and Red Sea. It also projects an image of a powerful navy, which helps bolster

5 Geography is a double-edged sword for Saudi Arabia. On the one hand, its various naval bases and commercial ports on its west coast offer refuge and supplies to the RSNF and Border Guard vessels, allowing them to stay out of the range of Iranian craft and missiles, and make it easier for Riyadh to project power from the homeland across the Eastern Mediterranean, East Africa, and the Gulf of Aden. On the other, having two separate coastlines requires Riyadh to divide its naval forces between the Gulf and the Red Sea, which would prevent it from concentrating its forces when needed, in case of conflict. Another challenge faced by the RSNF is that it is enclosed by three straits: the strait of Hormuz guarding the entrance to the Gulf, and the strait of Bab el Mandeb and the Suez Canal flanking the southern and northern entrances to the Red Sea, respectively.
6 This perception is the result of several developments during the past decade, including the US’ pivot to Asia, its decision to abandon Egyptian President Mubarak during the Arab Spring, its lack of a decisive response to the Abqaiq and Khurais attacks in September 2019, its withdrawal from Afghanistan, its redeployment of forces and equipment from the Middle East to the Indo-Pacific, and others.
Riyadh’s claims to regional leadership. To the casual observer, a larger number of vessels is often seen as a direct indicator of increased capabilities, while a smaller fleet, even if technologically advanced and more modern, tends to make less of an impression. The Kingdom’s historically limited exposure to the maritime domain and its weak naval industries have left a shortage of training opportunities and expertise in shipbuilding, as well as a lack of required infrastructure. These constraints have limited the Kingdom’s ability to strengthen its navy through domestic channels alone. As a result, procuring additional vessels from foreign suppliers has proven to be the most practical way for Saudi Arabia to enhance its naval capabilities.

**Riyadh’s Response to New Challenges: Strength in Numbers**

To pursue its strategic interests, Saudi Arabia has chosen to prioritize quantity over quality, adding more vessels to its navy and coast guard rather than focusing on less tangible enablers and force multipliers. As of 2022, the RSNF comprised 13,500 personnel and 3,000 Marines, significantly more than the 2,500 navy personnel in the UAEN. Figure 1 shows the considerable numerical disparity between RSNF and the UAEN, particularly when considering major naval platforms such as frigates and corvettes. While the aggregated displacement tonnage (a measure of the weight of the volume of water displaced by a ship) of the UAEN’s nine major combatants is less than 8,500 tons, that of the RSNF’s fifteen major combatants exceeds 39,500 tons—a fourfold increase over the past decade.7 Saudi Arabia can also field many more major patrol craft and naval aircraft than the UAE, whereas the difference in terms of minor patrol craft (those below 30 meters are not shown in Figure 1), auxiliary vessels, and amphibious and landing craft is minor, as can be seen in Figure 1.8 The Kingdom has also added dozens of minor patrol craft during the past decade, such as the Couach FPB 2200 patrol boat and the HSI32 Interceptor, significantly boosting the capabilities of its coast guard, which now operates under the aegis of the General Directorate of Border Guard within the Ministry of Interior. Saudi seems to have a requirement for around eight additional major surface combatants, although the specifics haven’t yet been revealed.

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Figure 1: Total Number of Vessels, Excluding Minor Patrol Craft (2023).9

Appendix 1 provides key definitions on these technical terms.

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7 In spite of this increase, the RSNF faces notable shortcoming in several areas. It lacks mine countermeasure vessels, a sizable fleet of logistical support vessels that could allow deployed platforms to sustain a deployment for a long time, and more specialized vessels like amphibious platforms, large landing ship tanks and landing helicopter docks.

8 The calculation in Figure 1 accounts for both their navies and coast guards (CICPA for the UAE, and Border Guard for Saudi Arabia).

While Figure 1 may provide some interesting insights, a purely quantitative comparison necessarily disregards qualitative elements that profoundly impact a nation’s naval capability. The next section sheds light on two key enablers and two force multipliers that have received less attention by the Saudi leadership, due to a series of structural constraints insufficient incentives, and occasionally suboptimal force planning. These factors encompass the aging of naval platforms, domestic shipbuilding capacity, the integration of unmanned technologies, and the availability of local training opportunities for sailors and technicians.

**Qualitative Factors**

**Force Multiplier 1: Platform Aging and the RSNF’s Urgent Need for Modernization**

The first significant qualitative factor that must be considered when evaluating a nation’s naval strength is the age of its vessels. Older vessels typically require more extended periods of maintenance, incurring higher costs in the process, and are often equipped with less advanced sensors and weaponry. Throughout the history of the RSNF, Saudi Arabia has never prioritized fleet modernization or readiness, historically choosing instead to prioritize other other military services like the Royal Saudi Air Force. This strategic calculus was largely due to Riyadh’s non-involvement in major conventional conflicts and the presence of the U.S. Navy in the Gulf. The fact that quantity is more visible—and thus more impactful to the untrained eye—than quality may have also played a role in Saudi Arabia’s decision to deprioritize modernizing its fleet.

![Figure 2: Longevity of the Main Vessels in the UAEN (green) and RSNF (blue) as of March 2024.](image)

Figure 2, which distinguishes Saudi vessels in blue and Emirati vessels in green, illustrates that as of March 2024, only five out of Saudi Arabia’s sixteen major vessels (frigates and corvettes) were constructed after 2010. It also shows how half of the RSNF’s major vessels were built between 1980-1990, more than three decades ago.

In other words, considering that the average lifespan of a major combat ship is an estimated 30-35 years, eight of the RSNF’s major combatants—half of its fleet—urgently need a replacement. The four Madinah-class frig-
ates are 37 years old, and the four Badr-class corvettes, which represent Riyadh’s strongest vessels in the Gulf, are 42 years old and likely unprepared for combat. Moreover, Saudi Arabia’s two main supply ships (not shown in Figure 2) are 38 years old, and the backbone of its patrol craft fleet, the nine As Siddiq-class patrol boats, are already over 40 years old.\textsuperscript{11} This dismal state of affairs has begun to change with the introduction of the five Avante corvettes built in Spain that will substitute the Madinah-class vessels in the Red Sea, and four U.S.-built littoral combat ship (LCS) frigates that will replace the aging Badr-class frigates. The LCSs, however, are taking longer than expected to arrive, leaving Saudi Arabia’s Eastern flank exposed. The Kingdom is also introducing dozens of new patrol craft, which will probably replace the As Siddiq and other aging platforms.

**Enabler 1: Saudi Domestic Shipbuilding Ambitions Still Lag Behind** \textsuperscript{12}

The second factor is domestic naval shipbuilding capacity, which decreases a nation’s dependence on external providers who may be unable (or unwilling) to provide specific vessels for the Kingdom. In general, if Saudi Arabia and the UAE want to present a more credible deterrent, they need some degree of domestic defense production; financial resources alone cannot always secure the desired weapons systems. For instance, in 2021, Italy halted the sale of thousands of missiles to Saudi Arabia and the UAE due to concerns regarding their use in Yemen\textsuperscript{13} and the Biden administration in the United States temporarily halted some arms sales to Saudi Arabia and the UAE for a similar reason.\textsuperscript{14} These examples show how relying on a single or a limited number of foreign weapons suppliers could jeopardize Riyadh or Abu Dhabi’s strategic autonomy.

Saudi Arabia’s domestic shipbuilding capacity is limited due to its limited maritime infrastructure. The Kingdom has never had an equivalent to Dubai’s massive Jebel Ali port, which attracts considerable shipping traffic and maritime-related expertise, subsequently facilitating the provision of repair and shipbuilding services and the development of relevant know-how. In Saudi Arabia, only three entities have current or planned shipbuilding capacity, as shown in Figure 3. Among these, the King Salman Global Maritime Industries Complex has yet to commence shipbuilding projects. Dammam Shipyard focuses exclusively on commercial shipbuilding, leaving Zamil Shipyard as the only major facility capable of building military vessels as of late 2022. Consequently, the vast majority of vessels in the RSNF have been procured from foreign sources, including the United States, France, Spain, Italy, Germany, the United Kingdom, and Singapore.\textsuperscript{15}

Still, Saudi Arabia is making substantial investments to enhance its shipbuilding capability. The Kingdom holds considerable potential, due to its larger workforce and increased commercial and military demand. These efforts are concentrated on the construction of the massive King Salman Global Maritime Industries Complex (see Figure 3), which is poised to become the world’s second-largest shipyard upon completion. The facility will be operated by International Maritime Industries (IMI). Saudi Arabia’s naval shipbuilding business will be managed by a new national champion called SOFON, which could potentially absorb sections of existing shipyards like Zamil Shipyards and Middle East Maritime Repair, in addition to its main facility located at King Salman Global Maritime Industries Complex.

In parallel, SAMI Sea, a subsidiary of Saudi Arabia’s defense conglomerate SAMI, has been tasked with developing a full and sovereign naval capability, with a focus on UUVs and USVs. With the support of the Kingdom’s Public Investment Fund, SAMI Sea may soon prove capable of designing and building its own naval vessels. A recent example of such localization efforts transpired in November 2022, when Saudi Arabia’s General Authority of Military Industries inked a memorandum of understanding with Spanish state-owned shipbuilder Navantia. This Saudi-Spanish partnership aims to deliver five multi-mission combat ships to the RNSF, which would probably be built in King Salman

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\textsuperscript{11} Alex Pape, *Jane’s Fighting Ships: 2019-2020.*

\textsuperscript{12} Domestic shipbuilding capacity refers to a country’s ability and resources to construct ships within its own borders. It encompasses the facilities, infrastructure, technology, skilled workforce, and expertise required to design, build, and outfit various types of vessels.

\textsuperscript{13} ‘Italy Blocks Sale of Missiles to Saudi Arabia and UAE’, *Reuters*, 29 January 2021.

\textsuperscript{14} Biden said that “We are ending all American support for offensive operations in the war in Yemen, including relevant arms sales...We’re going to continue to support and help Saudi Arabia defend its sovereignty and its territorial integrity and its people”. See: Joe Gould and Aaron Mehta, ‘Boeing, Raytheon Missile Sales to Saudi Arabia Paused by Biden Administration’, *Defense News*, 5 February 2021.

\textsuperscript{15} Alex Pape, *Jane’s Fighting Ships: 2019-2020.*
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Global Maritime Industries Complex, with their combat systems likely sourced from the joint venture SAMI-Navantia. The official contract, however, hasn't yet been signed. In the future, Saudi Arabia plans to build as many of the new vessels for its navy as possible at its domestic facilities. Vessels over 70 meters will be constructed at King Salman Global Maritime Industries Complex, whereas those under 70 meters will be built at Zamil Shipyards. To accompany these naval shipbuilding ambitions, SAMI has been developing its know-how in naval systems. A few years ago, it received a technology transfer from Navantia for CMS Hazem, and most recently, SAMI has launched the Naval Systems Integration and Development (NSID) Center of Excellence.

![Figure 3: Shipbuilding Companies in Saudi Arabia](image)

16 I used a variety of sources, primarily the online websites of each of those entities. Created by Datawrapper.
EXAMINING CHANGING SAUDI & EMIRATI NAVAL CAPABILITIES

**Force Multiplier 2: Saudi’s Embrace of Unmanned Technologies**

The third qualitative factor that impacts naval power is a nation’s expertise in unmanned technologies like Unmanned Surface Vessels, where Saudi efforts remain in a nascent stage. There are several contributing factors to Saudi weakness in this field, including the limited number of local STEM graduates and engineers with the requisite expertise, as well as a less-developed defense industry and R&D ecosystem compared to the UAE. Another element may be that the Kingdom’s relatively large pool of manpower renders USV development less appealing when additional weapons platforms may be manned without issue.

At the World Defense Show 2024, SAMI presented a USV with autonomous capabilities. SAMI has several partners for the system, including ST Engineering for sensors, with Eraf Group providing the patrol craft. Initially, the project involves converting crewed patrol craft into USVs, though SAMI has ambitions for a larger program for the Saudi Navy. Beyond SAMI’s efforts to develop USVs and Unmanned Underwater Vehicles (UUVs), another relevant development in the USV domain was the agreement signed by the UAE’s Al Seer and the Saudi Advanced Electronics Company in 2019. This agreement designated Al Seer as the primary manufacturer of USVs in Saudi Arabia, with AEC as its exclusive partner in the kingdom. However, since 2019, there have been limited updates on the progress of this project. Despite the apparent lack of progress, Saudi Arabia’s decision to conduct exercises with Task Force 59, a special task force of the US Naval Forces Central Command focusing on unmanned systems and AI, provides a glimmer of hope. Riyadh also appears to be in the process of acquiring USVs from the United States, according to Fifth Fleet commander Vice Adm. Brad Cooper. This demonstrates a commitment to advancing its capabilities in the realm of unmanned systems, despite its relatively expansive manned naval forces.

The increasing importance of unmanned technologies stems from USVs’ ability to compensate for the manpower limitations Saudi Arabia faces. USVs offer the prospect of deploying numerous vessels in the future, not just for Intelligence, Surveillance, and Reconnaissance (ISR) missions, but also for transport duties, combat operations, and patrolling ports and oil platforms throughout the Gulf and the Red Sea. USVs possess other advantages; they may navigate adverse weather conditions at greater speed without posing danger to any crew members on board. While some USVs have pilots on shore who act as remote operators, AI could further reduce manpower requirements. Al

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19 According to the OECD, in Saudi Arabia, the proportion of bachelor’s, master’s and doctoral or equivalent graduates in the field of STEM is one of the lowest among OECD and partner countries with available data (rank 43/45). See: ‘Saudi Arabia - Overview of the Education System’, OECD - Education GPS, n.d., https://gpseducation.oecd.org/CountryProfile?primaryCountry=SAU&threshold=10&topic=EO.
enables USVs to operate and resupply autonomously, in some cases for hundreds of days, with human intervention only required when AI systems detect anomalies or exceptional situations.

With such technology, Saudi Arabia could effortlessly deploy numerous USVs along its Red Sea coastline, using its various ports and coastal outposts as resupply bases. This would grant Saudi USVs the ability to autonomously operate a significant power projection capability that would span the entire Red Sea. USVs would be able to play a relevant role, because the average width of the Red Sea is 150 nautical miles, well within the range of many USVs. Even if the range were to become a problem, solutions like at-sea refueling stations are already under development.

Enabler 2: Training Opportunities for Recruits

The fourth factor that impacts Saudi naval power is training opportunities. The lack of a strong maritime ethos, combined with a relative neglect of the navy compared to the armed forces’ other services, may explain the limited number of existing training opportunities for Saudi sailors. Since 1986, the Jubail-based King Fahd Naval Academy has been the only major institution providing naval training. It was not until 2016 that the new National Maritime Academy (NMA) was established in Jubail, with a mandate to equip Saudi youth with relevant shipbuilding and marine engineering skills.

Recently, BAE Systems Saudi Development & Training began teaching at NMA in partnership with the City of Glasgow College. The Kingdom’s ambitions extend beyond the Jubail center, which is only the first step in a more ambitious training plan by NMA. Plans are underway for another branch in Ras al-Khair, which will address the Kingdom’s needs in shipbuilding and repairs training.

While Saudi leaders seem to have traditionally paid less attention to the qualitative factors that affect naval power, Riyadh has made an observable effort in recent years to rectify its weaknesses. The Kingdom is looking to modernize its fleet by acquiring additional frigates from Spain, the United States, and possibly South Korea. It is also embracing unmanned technologies and fostering human capital development, establishing the massive King Salman Global Maritime Industries Complex, exploring the purchase of USVs from the United States, and investing significantly in AI education.

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23 For instance, at least nine out of ten USVs used during Digital Horizon 2022, a naval exercise led by the U.S. 5th Fleet that took place between November and December 2022, have a range above 150 nautical miles. These are the Open Ocean Robotics Data Xplorer, the Exail DriX, the Saildrone Explorer, the Elbit System Seagull, the Seasats X3, the SeaTrac SP-48, the MARTAC T-38 Devil Ray, the Ocean Aero TRITON, and the Marine Advanced Robotics WAM-V.


28 The Saudi Data and Artificial Intelligence Authority hopes to train 300,000 school students in AI. See: Carrington Malin, ‘Saudi to Train 300,000 School Students; Intella Nets $3.4m Funding’, 18 August 2023, https://www.middleeastainews.com/p/saudi-to-train-300000-school-students.
The United Arab Emirates

Strategic Interests and Constraints Shaping the Development of Emirati Naval Capabilities

The sea has always played a formative role for the UAE, whose origins can be traced back to the Trucial States. In these sheikhdoms, the vast majority of the population lived in coastal cities and local economies were largely dependent on fishing, maritime trade, and pearling. Between 1855 and 1909, the Al Nahyan transformed Abu Dhabi into a regional power possessing the largest pearling fleet of over 400 boats in the Gulf. By 1905, Dubai emerged as the most important port in the Trucial States. After the UAE gained its independence, Dubai continued to grow, fostering a robust shipping and logistics industries centered around Port Rashid and Jebel Ali, which is today one of the world’s largest ports. Consequently, the small coastal state now stands as an important maritime hub and has developed a flourishing sea-faring culture.

In 2020, the UAE handled more than twice as much cargo in its ports as in neighboring Saudi Arabia, despite the vast size, population, and coastline disparity between the two nations. A thriving regional and international maritime hub, the maritime sector contributes around $25 billion to the UAE's GDP. As of 2022, over 27,000 maritime companies operating in the country. Dubai’s highly competitive position has placed the city as the world’s fifth-largest maritime, as well as the third-most appealing location for relocating shipping operations, further reinforcing the centrality of the maritime domain to the UAE’s economy and national security.

Despite the UAE’s seafaring culture and the importance of maritime trade to its economy, the country's navy has traditionally received less attention than its other military services. As in Saudi Arabia, this de-prioritization has been further made possible by the ever-present U.S. security umbrella over the Gulf. However, a combination of domestic, regional, and global changes has compelled the UAE to reassess the importance of its sea lines of communication and its naval forces, which evolved from one focused on coastal security into one capable of projecting power into nearby waters and subsequently across the region. This transformation was partly triggered by increased Iranian aggression at sea as the UAE continues to consolidate its position as a global maritime logistics hub, thus making sea trade and port security vital to the functioning of its economy. Additionally, strategic autonomy has risen to the top of the UAE’s pyramid of foreign policy priorities; Abu Dhabi clearly recognizes the need for enhanced expeditionary capabilities, which remain key to advancing its regional agenda and countering the rise of extremist entities across the Middle East.

These imperatives have all shaped the UAE’s approach to developing its naval capabilities. However, the federation’s smaller population has restricted the spec-

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30 Ulrichsen.
34 Geography presents a predicament to the UAE’s strategic posture vis-à-vis Iran, as all of the UAE’s bases are easily reachable by Iranian vessels, aircraft, and missiles. Most of these bases are located along the UAE’s west coast inside the Gulf, which in turn allows Iran to track which Emirati vessels decide to enter and leave the Gulf, as these must cross the Strait of Hormuz. This makes Emirati vessels extremely vulnerable in the event of a conflict with Iran. Only the Fujairah Naval Base sits outside of the Gulf, unconstrained by nearby straits.
In light of the country’s manpower scarcity, increasing the number of manned vessels in the navy presents a formidable challenge. As a result, the UAE has instead directed its focus towards qualitative enhancements that boost its naval capability by leveraging the more readily available maritime expertise already present in the country. This approach entails a heightened emphasis on two key enablers: the establishment of adequate training institutions for Emirati sailors, and the nurturing of multiple shipbuilders across the country. It also involves cultivating two technological force multipliers, which enables the UAE to field a modern navy and stay ahead of the technological curve—especially in unmanned technologies.

**Abu Dhabi’s Response to New Challenges: Prioritizing Qualitative Improvements**

**Enabler 1: Early Emphasis on Domestic Shipbuilding**

Owing to Dubai’s centrality as a maritime logistics hub and the proactiveness of UAE leaders, Emirati shipyards began producing new naval vessels in 1996, almost two decades earlier than their Saudi counterparts. Presently, the UAE is home to at least 24 shipbuilding companies (Figure 4), of which 17 have either produced or have plans to produce both military and commercial vessels. Among these, three stand out: Abu Dhabi Shipbuilding (ADSB), Al Fattan Ship Industries, and Abu Dhabi MAR. Founded in 1996, ADSB has built more than 250 vessels to date, including five corvettes, several Offshore Patrol Vessels, and numerous smaller patrol craft, and has repaired and maintained hundreds of others. Al Fattan Ship Industries, which has grown to become a major shipbuilder in the Arabian Peninsula, has provided patrol boats to the UAE’s coast guard, the Critical Infrastructure and Coastal Protection Authority (CICPA), for over a decade. Meanwhile, Abu Dhabi MAR has amassed significant expertise through investments made by its parent company, Privinvest, in shipyards in France, Germany, and Greece.

35 The UAE’s total population is one-third that of Saudi Arabia. If foreign nationals are excluded, this figure drops to one-sixteenth.

A visual representation of the UAE’s shipbuilding landscape is illustrated in Figure 4, denoting the headquarters of the most significant shipbuilding companies. Abu Dhabi and Dubai clearly dominate shipyards. Interestingly, all shipbuilding companies in Abu Dhabi have the capacity to build military vessels, while only a minority in Dubai can do so, as they are primarily focused on commercial shipbuilding and repairs. The highlighted areas in red indicate the main concentrations of shipyards and repair docks, with notable concentrations in Dubai Maritime City and in the industrial district of Musaffah southwest of Abu Dhabi.

The most tangible outcome of this sovereign shipbuilding capability is that numerous vessels in the UAE’s maritime services have been built domestically, which is not the case with Saudi Arabia. As Figure 5 shows, even before the turn of the century, four landing craft had already been built in the UAE. The most complex shipbuilding project undertaken in Emirati shipyards during the past two decades was the Baynunah corvette. After the lead ship was built in France by Constructions Mécaniques de Normandie, the Abu Dhabi-based ADSB built five additional

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37 I used a variety of sources, primarily the online websites of each of those entities. Created with Datawrapper.

38 This is not an exhaustive endeavor.
corvettes that were eventually delivered to the UAEN between 2012 and 2017. Most recently, ADSB’s parent company set up a joint venture with Italian shipbuilder Fincantieri to manufacture naval vessels, with a commercial pipeline worth about €30 billion. It will be awarded prime rights to non-Nato orders as well as several orders by select Nato members. This joint venture also plans to develop an underwater programme for mid-size submarines.

Figure 5: UAEN and CICPA vessels built or designed in the UAE.³⁹

In short, despite the UAE’s demographic limitations, it has found ways to mitigate manpower shortages through the strategic enlistment of its domestic shipbuilding industry. This capacity not only enables the UAE to supply defense materiel to foreign forces and coast guards it chooses to support, but also extends to non-state actors. In 2008, ADSB built four landing craft for the Bahrain Navy.⁴⁰ A few years later, the UAE donated 60 patrol boats built domestically by Al Fattan Shipbuilding to the Yemeni coast guard before the Yemeni Civil War began in 2014, to help secure Yemen’s coastline in the Red Sea.⁴¹ More recently, ADSB signed a $1 billion agreement with Angola to build three corvettes and other smaller craft,⁴² and a memorandum of understanding with Indonesia’s state-owned shipbuilder to build a range of interceptors, landing craft, and rigid-hull inflatable boats for Indonesia’s navy and coast guard.⁴³

³⁹ A variety of sources, primarily: Alex Pape, Jane’s Fighting Ships: 2019-2020. Note: vessels are built, launched, and commissioned on different dates, especially when they come in batches. Unfortunately, I did not have access to all the dates for each vessel or batch of vessels, so the date they are tied to is a rough approximation of their order/delivery dates.
⁴¹ While one may be able to donate platforms that were previously purchased from a different country, the truth is that that often faces sometimes there are restrictions.
EXAMINING CHANGING SAUDI & EMIRATI NAVAL CAPABILITIES

Force Multiplier 1: Doubling Down on Unmanned Technologies

Given its pronounced manpower limitations, the UAE demonstrated an early recognition of the power of leveraging unmanned systems, as reflected in its prescient efforts to develop USV technology. For example, Abu Dhabi-based Al Seer Marine began working on its first USV prototype in 2011, subsequently partnering with Florida-based 5G International a few years later to develop three models of USV. It then joined forces with Saudi Arabia’s Advanced Electronics Company in 2019 to build USVs, and with L3 Harris in 2021 to enhance the autonomous capabilities of Al Seer’s USVs, giving them the ability to navigate autonomously with collision avoidance capability. This technologically-advanced USV was then displayed at the 2021 International Defense Exhibition in Abu Dhabi. Al Seer is also working with Monaco-based MARSS to enhance the situational awareness and automatic threat detection in its unmanned vessels. Taken together, Al Seer appears to have had some degree of success, as illustrated by these partnerships and by the seemingly capable drone it has developed.

Al Seer Marine was not alone in the pursuit of USV technology. Abu Dhabi-based International Golden Group, a major defense supplier, acquired Finland-based Boomeranger Boats in 2015. More recently, in 2019, Florida-based Teledyne Marine announced it would partner with the Emirati Trust International Group to sell unmanned systems to the UAEN. Two years later, after the Abraham Accords allowed for technology cooperation between the UAE and Israel, ADSB signed an agreement with Israel Aerospace Industries to jointly design USVs with military and commercial applications.

In early 2022, Emirati Yahsat partnered with Al Seer to equip the latter’s USVs with Yahsat’s satellite communications system. In 2023, ADSB unveiled the 170M-Detector, a new USV that can be operated in manned or unmanned modes to perform surface warfare, transport, surveillance, and mapping missions. Only a few months later, it was reported that ADSB had entered into talks with Malaysia for the sale of its USVs. Several other firms are also engaged in USV development, including Smart Own, Milkor, 90 Degree, Sentient Labs, and Crown Ships. We haven’t yet seen the UAEN deploy USVs in large numbers, but these examples are evidence of the interest to do so in the near future.

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49 A 17-meter version they are working on will reportedly be able to operate remotely, semi-autonomously, or autonomously. See: Seth Frantzman, ‘Israeli, Emirati Companies Partner up on Unmanned Surface Vessels’, Defense News, 2021, https://www.defensenews.com/digital-show-dailies/dubai-air-show/2021/11/18/israeli-emirati-companies-partner-up-on-unmanned-surface-vessels/. A 17-meter version they are working on will reportedly be able to operate remotely, semi-autonomously, or autonomously. See: Frantzman.
51 Smart Own has been developing the B7 Beagle USV since 2009. With a range of 800 nautical miles, it can be used for coastal defense, anti-piracy, and deep interdiction. See: ‘Subsidiaries - Boomeranger’.
The UAE has further accelerated the development of unmanned technologies through the biannual Mohamed bin Zayed International Robotics Challenge, a robotics competition that draws participation from research institutions, companies, and universities from all around the world.\textsuperscript{52} This competition aims to advance communication between autonomous UAVs and USVs, which will need to accomplish a set of tasks related to the UAE's pressing maritime security challenges, including piracy, smuggling, and coastline security. The final demonstration for this competition will be held in Abu Dhabi in February 2024.\textsuperscript{53}

**Enabler 2: Abundant Training Opportunities in the Emirati Maritime Sphere**

The establishment of numerous maritime and naval training institutions has also helped the UAE in mitigating its manpower constraints by broadening the pool of available sailors and technicians equipped with the requisite expertise. There are at least 12 commercial academies in the UAE (Figure 6), of which seven provide courses that encompass military or security components. For instance, Al Seer Marine Training Institute offers military courses such as “Military Boat Operator, Maritime Interdiction, Maritime Raiding Operations & Amphibious Landings, and Landing Craft Beach Operations,” among others. Al Seer also trains operators and commanders to operate USVs.\textsuperscript{54}

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\textsuperscript{55} I relied on the online websites of most of those entities, although in those cases where no online website could be found, I resorted to a variety of secondary sources that pointed to their existence. Created with Datawrapper.
In addition to these commercial academies, the UAE houses at least three training institutions for the navy, all of which are located in the emirate of Abu Dhabi. These are: the Rashid bin Saeed Al Maktoum Naval War College, established in 1999 to function as the naval academy of the UAE Armed Forces; the Naval Doctrine and Training Combat Center, a state-of-the-art facility with advanced training simulators; and the Underwater Training Center, the first of its kind in the region, developed by France’s Thales Group to provide anti-submarine warfare training. For its part, Dubai appears to have a larger concentration of commercial academies, as seen in Figure 6.

Dubai is also home to the Dubai Maritime City, a large multipurpose maritime zone which houses an industrial precinct that boasts marine services and an educational campus. The concentration of maritime-related businesses in the UAE has drawn various maritime conferences to the region, facilitating a nexus between local industry and naval professionals and global experts. Playing host to international conferences and exhibitions represents an opportunity for the UAE to acquire expertise and relevant knowledge. For instance, Abu Dhabi has hosted NAVDEX since 2011, a major naval defense and maritime security exhibition, bringing hundreds of naval and defense experts together every two years.

**Force Multiplier 2: Maintaining a Modern Fleet of Major Combatants**

Abu Dhabi has demonstrated competency in ensuring that its fleet remains up to date, a choice intended to mitigate the constraints posed by manpower scarcity. Seven out of the UAEN’s nine major combatant ships were constructed after 2010. This trend is mirrored across other naval classes, with Emirati fast attack craft, patrol craft, amphibious vessels, and auxiliaries being generally newer than their Saudi counterparts.

![Figure 7: Longevity of the Main Vessels in the UAEN (green) and RSNF (blue) as of March 2024.](image)

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57 Some examples are the UAE Maritime Week, the Smart Maritime Network Dubai Conference, Seatrade Maritime ME, The Maritime Standard Tanker Conference, Dubai Maritime Agenda, the International Conference on Maritime Transport Costs and Port Efficiency (ICMTCPE), the International Conference on Maritime Law and Management (ICMLM), the International Conference on International Maritime Transport Security (ICIMTS), the International Conference on Maritime Law (ICML), or the International Conference on Ports, Maritime and Coastal Infrastructure (ICPMCI).

58 As a reminder, only four out of Saudi Arabia’s 15 major combatants were built after 2010.

Manpower Scarcity Inhibits Acquisition of Crewed Systems

As noted in previous sections, the UAE Armed Forces in general and the UAEN in particular face severe manpow-
er shortages that inherently restrict the number and size of naval platforms in the field. This may explain why
the UAEN has chosen to invest in multi-mission vessels, such as the existing Baynunah-class and the incoming
Gowind corvettes, rather than in more specialized platforms. Multi-mission vessels offer versatility and are
capable of fulfilling a spectrum of tasks, such as patrolling, surveillance, minelaying, maritime interdiction, and
anti-surface warfare operations.\textsuperscript{60} Even with 2,500 sailors, however, it remains a challenge to man and maintain
all of the UAEN's vessels, which include nine major combatants, 20 major patrol craft, 33 amphibious and land-
ing craft, seven auxiliary vessels, 16 aircraft, and other smaller patrol craft (Figure 8). For example, the crew of
each of its six Baynunah-class corvettes averages around 60, collectively accounting for 1/7th of the navy's total
personnel.

<table>
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<tr>
<th>Frigates &amp; Corvettes</th>
<th>Major Patrol Craft (+30m)</th>
<th>Amphibious &amp; Landing Craft</th>
<th>Auxiliaries: Logistics &amp; Support</th>
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<td>UAE</td>
<td>9</td>
<td>20</td>
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Figure 8: Total Number of Vessels, Excluding Minor Patrol Craft (2023).\textsuperscript{61}

Appendix 1 provides key definitions on these technical terms.

It is worth noting that the UAEN has been developing a sizable expeditionary capability. Abu Dhabi recognized
the importance of power projection to advance its regional agenda, especially after the UAE's experiences in
Libya and Yemen. In addition to approximately 16 small landing craft, the UAE can deploy 12 small landing ships
averaging 740 tons each, and five larger landing ships averaging 2,600 tons each, which can carry tanks and heli-
copters. Furthermore, the UAE recently signed a $408 million deal to acquire a 163-meter multi-role support ship
from PT Pal Indonesia, which will further bolster the UAE's expeditionary capabilities.\textsuperscript{62}

\textsuperscript{60} Athol Yates, \textit{The Evolution of the Armed Forces of the United Arab Emirates} (Helion and Company, 2020). p267
\textsuperscript{62} Harry Lye and Giovanni Rasio, ‘NAVDEX 2023: UAE Buys Indonesian Support Ship in $400 Million Deal’, \textit{Shephard}, 22 February 2023,
Conclusion: Divergent Priorities and Constraints

This report has outlined the contrasting strategic priorities and constraints that have steered the development trajectories of the RSNF and the UAEN. Saudi Arabia’s larger manpower pool, its need to cover a much larger coastline, and its comparatively less developed maritime industrial base have compelled it to emphasize a quantitative expansion of its navy at the expense of other qualitative factors. By contrast, the UAE’s manpower constraints propelled the development of the UAEN in a different direction, marked by a focus on developing a dynamic shipbuilding industry and providing abundant training opportunities—two key enablers of naval capability that grant the UAE greater control over the production of its naval platforms and the cultivation of skilled naval personnel. Abu Dhabi has also invested significant resources into modernizing its navy and has an edge on USV-related programs and R&D, which Emirati leaders hope will compensate for the country’s dearth of manned combatant ships.

Though Saudi Arabia has traditionally placed greater emphasis on the quantity of its naval platforms than qualitative components, it is now showing signs of addressing this imbalance. To modernize its aging fleet, the RSNF will soon receive four Multi-Mission Surface Combatants from Lockheed Martin. The Kingdom also hopes to acquire up to eight additional major surface combatants. Meanwhile, Riyadh’s bet on the massive King Salman Global Maritime Industries Complex is risky and inorganic, compared to the development of the shipbuilding industry in the UAE, but could still pay off. Once the facility is up and running, the Kingdom could meet a significant portion of its demand for vessels through domestic production.

As for embracing unmanned technology, Saudi Arabia still lags behind, but a successful breakthrough in SAMI’s USV program with ST Engineering, as well as a potential acquisition of a foreign USV maker could accelerate its progress significantly. A Saudi acquisition of foreign-produced USVs could expedite the Kingdom’s acquisition of these technologies without needing to wait for domestic players to enter the market. Last but not least, strengthening the country’s maritime ethos, improving the available training opportunities, and achieving a globally recognized position as a maritime hub are endeavors that may take several years, if not decades, to reach full fruition.

Appendix 1: Definitions of Technical Terms

- **Major combatants**: These are vessels designed for naval warfare, which in the case of the UAE and Saudi Arabia includes frigates and corvettes.
  - Frigates are warships whose role and capabilities have varied depending on the era. While a universally agreed-upon definition is elusive, they are typically described as intermediate-sized warships, between a corvette (smaller) and a destroyer (larger). Frigates may have specialized roles such as anti-submarine warfare, anti-surface warfare, anti-air warfare, and their displacement tends to range between 3,000-6,000 tons.
  - Corvettes are smaller warships typically between 500 and 2,000 tons.

- **Patrol craft**: These vessels are intended for coastal defence, border security, or law enforcement, and can belong to both the navy and the coast guard. I chose to separate major patrol craft (over 30 meters in length) from minor ones (below 30 meters).

- **Amphibious & landing craft**: This includes vessels designed to transport forces from sea to shore.

- **Auxiliary vessels**: These are designed to provide logistics support in the form of food, water, fuel, and equipment.
Bibliography


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