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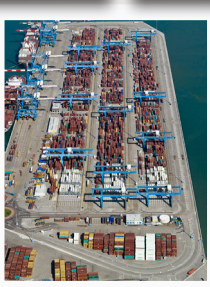
המרכז לחקר מדיניות ואסטרטגיה ימית
Maritime Policy & Strategy Research Center

MARITIME STRATEGIC EVALUATION FOR ISRAEL 2019/20

Chief editor: **Prof. Shaul Chorev**

Edited and produced by: **Ehud Gonen**



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March 2020

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The Maritime Strategy Evaluation report, including the insights and recommendations included in it, are based on the personal experience and professional judgment of the authors, but do not necessarily represent the official position of the Center or of the Haifa University.

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Maritime Policy & Strategy Research Center

The center is developing knowledge in maritime strategy, focusing on Israel's maritime surroundings: the Eastern Mediterranean and the Red Sea. The center does so in five core areas: (1) regional security and foreign policy, (2) the mobility of goods, people and ideas, (3) law, (4) energy (5) and the environment.

The center was established in response to the of rising significance of the maritime domain both globally and in our region: the emerging strategic maritime competition between the United State and China, the expansion of exclusive economic zones (EEZ) and the crucial role of the seas in the international economic system both as a source of economic activity as well as serving as the world's main trade route. Our immediate environment saw a similar rise in the significance of the seas including the oil discoveries in the eastern Mediterranean, the evolution of the Israeli navy into a national strategic arm, Israel's total dependence on sea trade, and the growing realization that future development of national infrastructure may have to be done in the sea as land is becoming scarce.

Content

Executive Summary

The maritime evaluation for Israel 2019/2020 includes 18 chapters reviewing many aspects regarding maritime policy and strategy in Israel.

From the analysis of all aspects reviewed in this year's report, the following insights emerge:

- The eastern Mediterranean, the Persian Gulf and the south of the Red Sea- are in a state of instability.
- The United States – reduced its presence and maritime influence in the eastern Mediterranean region.
- Russia – strengthens its presence and influence in the Eastern Mediterranean region and throughout the entire Middle East.
- China – a rising superpower that employs a geo-economic strategy and "soft power" in order to position itself as an influential power in the region.
- Iran – manages a brinkmanship policy against the United States, though it's too soon to assess the implications of Qasem Soleimani's elimination on Iranian policy in the future.
- The formation of Russia, Turkey and Iran axis.
- The weakening of the pragmatic Sunni bloc (led by Egypt and Saudi Arabia) as a balancing force or 'oppositional' against Iran in the region.
- Turkey's defiant policy towards NATO and an attempt to determine new facts within its maritime borders demarcation.
- The Ministry of Defense and the navy's procurement policy are a major issue within public discourse in recent election campaigns.
- The maritime environment issues began being central in the Israeli public discourse.

In accordance with these insights and other issues raised in the report, it incorporates policy and actions recommendations for decision-makers at the top political and professional level, that, according to its authors, can assist Israel in coping with the challenges of which the report points at.

The first three chapters of the marine strategic assessment discuss global trends:

The first chapter in the report opens with **a review of global trends** in the international system, next it concentrates on derivatives of these developments in the maritime sphere. In general, it can be said that the world is faced with a situation of an increasing

worldwide instability, characterized by a decline in the world order based on long-standing rules, and instead created a more complex and volatile security environment than anything we have experienced in the past. Strategic inter-state competition, especially between the three great powers: The United States, Russia and China, is expressed in increasing tensions in many parts of the world. President of the United States Donald Trump, that is supposed to lead western democratic states, continues to show messages of separatism, and the world that has become multi-polar and nationalist pays less attention to the Western leadership as was expressed in the G-7 States Summit held in the fall of 2019 in Paris. Russia's president, Vladimir Putin takes advantage of, the Trump administration in the US directing most of its attention to the east Asian region (pivot to Asia), as well as the EU economic and political disorder- the power vacuum created by this US policy in the Middle East, and becomes the dominant statesman in the Middle East region. The Russian president's trip to the Persian Gulf states in October 2019, including a visit to Saudi Arabia, are successful at driving a wedge between the Sunni states block that were on the United States' side in regard to halting the Iranian threat. China, under the leadership of president Xi, continues its military buildup and strengthens its economic position in Southeast Asia in particular, and in the European-Asian region as a whole, using the belt and road policy. The US withdrawal from the nuclear deal with Iran and increasing the sanctions imposed on it brought about retaliations from Iran, the most significant being "The Tankers War" in the Persian Gulf area. In the first week of January 2020, a US drone eliminated the Iranian Al Quds force commander Qassem Soleimani. In response a number of missiles and rockets were launched on US bases in Iraq. It can be said that to some extent, the Americans have restored their deterrence towards the Iranians. And that is after they did not respond to a series of provocations towards them and their allies in the region. On the background of climate changes occurring before our eyes, two notable phenomena engage humanity: **The first**: the rise of seawater levels and the significance of this rise in a few decades on flooding low areas on earth and the need to evacuate their citizens. **And the second**: opening the Arctic ocean route and the struggles over the resources found in its waters. It's worth mentioning that the subject of **climate changes** in the world as a whole, and its influence on the maritime sphere in particular, have long become a global strategic problem that the UN and its scientific committees are trying to draw international attention to in "a wakeup call", not yet fully understood in all its severity among the world leaders.

The second chapter discusses **military developments in the maritime sphere** and reviews the general trends in security expenses, as well as the component of these expenses invested in various countries' war fleets. Aside from the powers' fleets (or "blue waters fleets" of different types), the report also focuses on two fleets that are

undergoing unprecedented strengthening process in the Eastern Middle East which are the Turkish and Egyptian fleets.

The third chapter reviews **the new geo-strategic region, the Indo-Pacific region**, and examines the question "Will the change succeed?" as the U.S department of defense report states in 2010:" The United States has a significant interest in the stability of the Indian Ocean region as a whole which will play a very important role in global economy." The region has been described as having the potential for future conflict and inter-state competition, but also as having international security issues beyond national borders and for non-state players. More than half of the world's armed conflicts occur today in the Indian Ocean region. This region contains a growth ground for the continuous development of strategies, including the rise of competition between China and India, potential nuclear conflict between India and Pakistan, Islamic terror, increased prevalence of piracy in and around the Horn of Africa and diminishing fishery resources management. As a result of all this, almost all of the world's largest forces deployed significant military forces in the Indian Ocean region. Accordingly, close to 120 warships of 20 various fleets are in this area throughout the year in order to protect their state's interests in the region. Given the complexity of the region and the multitude of countries residing in it, some or most with different interests, and that is on the background of China's status and policy in the regions of Asia and the Pacific Ocean. It is still unclear how the strategy of "region framing" as a unique region will affect the geopolitical and geo-strategic moves occurring in it.

Four subsequent chapters discuss a number of foreign fleets in the world and in our region:

The fourth chapter is reviewed in the center's recent reports and this year too we chose to discuss it and its content is **the Russian maritime presence in the eastern Mediterranean**. A number of reports published by HMS, including latest Hudson report, covered the establishment of the Russian navy in the Eastern Mediterranean as a whole, and in the Syrian coastline strip in particular. The lease of Tartus port by the Russian navy for 49 years only illustrated the fact that the Russians increased their activities in the region not only because of the civil war in Syria. The news published recently about the discovery of a Russian submarine by navy ships west to the coasts of Israel captured public attention in Israel for the event itself, that is without trying and understanding the big picture. This chapter attempts at shedding light on the targets of the Russian navy as well as the characteristics of its activity.

The fifth chapter discusses **Russia's "Arctic strategy"** as a strategy derived from inter-systematic power struggles. The article's author notes that the Russian establishment

in the northern ocean shores has a very long history. In an attempt to understand the arctic strategy, the article's author raises the hypothesis that the issue of **"the threat in the Arctic"** is used by the navy top command, which a significant part of its representatives, including the Russian navy admiral, are in an inter-systematic struggle about the influence and budgets.

The sixth chapter discusses **the tankers war in the Persian Gulf**. Since the summer of 2019 the tension between Washington and Teheran has increased with the capture of the Iranian tanker 'Grace 1' in the straits of Gibraltar, and tightening the sanctions on Iran and on the group of states and organizations supported by it, by the Trump administration which caused a renewed inflammation of tension around shipping traffic in the straits of Hormuz, especially in the context of tankers traffic from and to the Persian Gulf. The background to the renewed tension is the increasingly tightening sanctions that the U.S imposed on Iran in order to bring it to the negotiation table regarding the nuclear issue. In response Iran's rulers and amongst them President Rouhani and the revolutionary guards' commanding officers threatened that their country will block the straits of Hormuz and will prevent oil cargos traffic to the international markets. The Iranians actualized these threats by detaining a number of tankers in the straits, and in September 2019 executed a widespread attack on Saudi oil facilities targets by drones and cruise missiles launched from Iran's territory. The chapter reviews the current tanker war compared with the tanker war that occurred during Iraq-Iran war and the situation in the straits of Hormuz region.

The seventh chapter describes the process of **the Egyptian navy empowerment** that has undergone an unprecedented empowerment process in recent years. It will be emphasized that Egypt signed a peace treaty with Israel, and cooperates with it on many security issues, and especially with regard to what is happening in Gaza strip. Egypt as well as Israel has important interests located in the maritime sphere, from shipping security in Suez Canal, protection of the gas infrastructures located at its economic waters in the Mediterranean, to cruise security in the south of the Red Sea, cruise that drains to and from Suez Canal. The threats that the Houthi organization has made on this cruise require the Egyptians to build and operate a naval force capable of operating in this region. In this context of empowerment of the Egyptian navy, the question has recently arisen: haven't the quality and technological advantage (QME) the Israeli navy had up until now been broken in several domains? This review allows an expended perspective of these processes.

Three chapters review economic aspects in the Israeli economy:

The eighth chapter is dedicated to reviewing **the vitality of private shipyard infrastructures in Israel** as a vital national infrastructure to the state's self-reliance on the construction and maintenance of military naval vessels for the Israeli navy. With that discusses the concept of 'self-reliance' of countries on their military industries as a whole, and in the maritime sphere in particular, while discussing the various motives for implementing the concept. The chapter also discusses the Israeli case while reviewing the current and expected state of the navy and reviewing shipyard infrastructures, both the navy's and private shipyards: Israel Shipyard. Finally, the article presents policy recommendations with regard to the need for a civilian private shipyard in Israel, as evidenced in the extensive research work carried out by the Center for Maritime Policy and Strategy Research for "Israel Shipyards".

The ninth chapter discusses **the security cabinet's decision to establish a mechanism for examining incoming foreign investments in Israel**, probably in response to the public debate that developed after granting the Chinese company SIPG an operating franchise to the HaMifratz port for a period of 25 years. The chapter reviews the relevant Israeli economic policy (economic openness policy), the trades and investments between Israel and china, and analyzes the cabinet's decision in light of its stated purpose, the structure of the mechanism it has adopted and the type of transactions to which it applies. The review's conclusion is that this is a declarative decision, the mechanism set up is barren and empty of content, and in practice, it seems that an open economic policy will continue (international trade and investments) that has been led in Israel for the past 30 years- a policy that opened the Israeli economy to the process of globalization.

The tenth chapter discusses the subject of **the Israeli ports' activity**. In the strategic assessment report of last year were deeply reviewed a number of subjects in the field of shipping and ports: "Israeli ports activity", "Israeli shipping where to?", "Strategic and national aspects in the area of general cargo shipping and bulk" and "International aspects in the operating of a private port in the territory of Israel shipyards." We have therefore chosen to focus on two subjects this year: "Ports operating model through Israel Ports Company (IPC) using the 'land lord company' method and port authority", as well as "in commercial ports activity in Israel (Haifa, Israel shipyards, Ashdod and Eilat)". As for the situation of Israeli shipping, no improvement was achieved compared to the previous year, and at the Israeli shipping day convention held in October 29th 2019 in Haifa, the president of the Israeli shipping bureau, Dr. Yoram Zaba, noted that "The important reform agreements in Israeli ports have not yet been signed after more than six years of negotiation. The occupancy tax law, which began to formulate in

2009, and which is supposed to save Israeli shipping, is delayed for a second and third call." Furthermore, Israeli merchant fleet data (ownership and control) presented on shipping day indicate that out of 35 ships under Israeli control, only six ships sail under an Israeli flag. This figure has been steadily declining in recent years and is a negative historical record. The number of seamen (officers) active in 2018 is 110 (compared with 166 in 2016, and 128 in 2017), which is barely enough to fulfill half the standards required in Israeli ships today.[1]

The five subsequent chapters cover aspects of technology, energy and environment:

The eleventh chapter in the report covers **methods of using state cyber security systems in the marine civil sector**, and its purpose is to present examples of various methods used in state civilian marine cyber security systems. In recent years began the development in civilian marine cyber security systems of some of the countries considered to be advanced in terms of cyber security. The occurrence of maritime cyber events with a broad international and local influence and other reasons let to the strengthening of this trend. Cyber security has even been integrated into the maritime strategies of some of the major countries operating in the maritime sphere. States have established marine cyber security systems that include a variety of tools in order to manage risks to critical and other infrastructures in the civilian maritime sphere.

The twelve chapter discusses the subject of **"autonomous civil shipping"** – that is, a merchant fleet without seamen. 'Driverless' transportation systems have acquired sufficient operational reliability in some transport areas as well as in the marine area, and autonomous operation of underwater vehicles for research purposes has been around for several years. Implementation of this concept on merchant ships provides a possible holistic solution for dealing with existing and growing requirements for maritime transport. Autonomous and unmanned ships are new concepts that will challenge conventional methods for designing, testing and approving ships and their systems. This will require to a certain extent also a new state of mind, perhaps not necessarily on the technological side of the subject, but in sociological and anthropological aspects.

The thirteenth chapter discusses the subject of **recent developments which occurred in the field of energy in the Eastern Mediterranean**. Accomplishing the development of Leviathan gas field marks the beginning of another significant decade in the Israeli energy market which will bring about more energy security comparing to previous decade, will generate more governmental revenue from royalties, and will continue the downward trend in air pollution. However, Israeli gas export options will remain limited

1 Shipping in Israel- ID, Israeli shipping bureau, Haifa, sixth edition, P. 11-12

to its neighbors in the coming years as well due to falling gas prices in Europe, Turkish-Cypriot and Israeli-Lebanese rivalries around maritime boarders between them which will continue to obscure the potential for significant development of regional resources, and the reciprocal attacks between Iran and Saudi Arabia against oil facilities and oil tankers in the Persian Gulf that will create new security risks for the regional oil market and could also affect Israel. While increasing the use of renewable energy for generating electricity may be part of the solution for these challenges, in this stage of renewable energies use, technological and economical barriers make it difficult to realize its use on a very large scale nationally.

The fourteenth chapter discusses one of the issues of maritime environment and which is **expected climate changes and their effect on Israel**. As a small densely populated country which is characterized by population and economic growth on the background of land and water scarcity, Israel knows the significance of preparing for climate changes. During the last decade tens of various Israeli studies, and also groups composed of government, academy, industry and none-governmental organizations representatives gather knowledge about climate changes and their influences on water, health, biological diversity and the green building. Israel in some ways is an ‘island country' that is very much dependent on its marine sphere, for trade as well for resource extraction from sea, and scientific studies about climate changes influence of the marine security are still in their infancy. This article presents modern information about climate change in the world and in the area of Israel, its potential effect on different aspects of the state of Israel's marine sphere security and recommendations according to this knowledge.

The fifteenth chapter discusses **preparation of the state of Israel for tsunami events**. The author states that an occurrence of a significant tsunami event in the eastern Mediterranean is just a matter of time, and that history proves that a significant event occurs at an average frequency of one to 800-1000 years, and the last one occurred in 1303. The geographical structure of Israel and concentration of infrastructures and population along the coastal strip significantly increases the potential for tsunami damage to such a degree that if, god forbid, it will occur it'll make it difficult for the country to recover from it for many years. The government's decision on the subject that determined 2016 as a target year for establishing an alert center is being done very slowly, and such center has yet to be established. The author states the issues to address in order to raise Israel's readiness level to the issue and in them: implementation of government's decision on the matter, raising the level of civilian awareness, focused attendance of essential infrastructures and formulating procedures for operating/ disabling essential facilities during this type of event.

The last three chapters of the document discusses the building of the navy's marine force:

The sixteenth chapter discusses the subject of **the perception of execution of force-Sa'ar ships in the Israeli navy**. On December 2019 with the passing of fifty years for "operation Noa" in which five "Cherbourg ships" out of a series of 12 ships built in France were escaped from the French embargo imposed on Israel after the Six Days War. The ships arrival at Israel finished the construction project of 12 "Sa'ar ships". Moving from a navy based on large destroyers and old-fashioned torpedoes to a high-speed Sa'ar ships fleet with advanced Israeli weaponry systems (and the sea-sea missiles of type "Gabriel" in particular), was a change in the combat perception of the navy, a change that proved itself very successfully in the marine warfare in Yom Ha'kipurim War (1973). The passing of 50 years of the arrival of Cherbourg ships to Israel allows an historic point of view of the navy's current arming project with "Magen" ships (that are rightly or not called also by the name Sa'ar 6) whose construction is being completed in Germany. The "Magen" ships are the biggest investment made in the area of field warfare in the Israeli navy in recent years. The article discuss the comparison of considerations and decisions that led to the abandonment of principles of operating a number of small and fast Sa'ar ships by the navy in choosing the new "Magen" ships, and choosing an option of a few big, slow and expensive vessels rather than the outlook that the navy has had since the sixties whereby equipment with many fast vessels with diverse capabilities are needed. The article does not discuss the procurement processes of these ships that were criticized by other factors.

The seventieth chapter covers the subject of **landing from sea**. The navy operated in the past two successful landing operations during the War of Attrition (‘Raviv' operation in the west bank of Suez Gulf) and the Peace for Galilee War of 1982 (in the Awali river estuary in the north of Sidon). With that, began an increase in the beginning of the 21th century in using target attack operations in the coast with accurate missiles launched from vessels at sea as standoff weapon, what doesn't leave any doubt regarding the significance of this component in marine operations. This kind of operations have always been challenged in their most vulnerable point which was in dealing between the landing force from sea and the defenders at the coast. At this time this kind of operations are challenged in a more difficult manner because the standoff weapon, stationed on land (for naval forces as well as aerial forces) significantly improved in its operational range as well as its effectiveness. This can enable protecting coast facilities almost without operating naval force, defending long coastline areas, and to significantly restrict the enemies' possibilities to execute landing operations. Therefore, naval strategists raise doubt regarding the ability to execute major landing operations

such as the ones that occurred in Second World War in Normandy or in the Korean war in Inchon with the passing of 50 years to the War of Attrition as a whole and ‘Raviv operation' in particular, his article seeks to examine whether landing from sea as a naval flanking in its classical format is still a possible operation outline for the IDF.

The eighteenth chapter of the report discusses **maritime terror** and presents the Israeli point of view about the coping of many years with maritime terror. The material for the article was presented by HMS's researchers in a workshop sponsored by NATO held in Copenhagen in May 2019. The article presents an historical review of the maritime terror phenomenon with which Israel deals. The review includes a discussion about different events and scenarios with which Israel dealt throughout history, as well as a discussion regarding the more current trends involving different characteristics of the maritime terror. The latter part of this article presents the challenges with which Israel is dealing today in the context of maritime terror. The author's conclusions are that the coping with maritime terror requires first class intelligence, preventive approach, an updated and suitable doctrine, creativity and novelty and weapon systems study and development.

From the desk of the Head of the Maritime Policy and Strategy Research Center (HMS)

This is the fifth national maritime strategic assessment for Israel, published by the Maritime Policy and Strategy Research Center at the University of Haifa (HMS).

The center, founded in early 2016, stated its **vision** is to be an interdisciplinary, Israeli, leading and unique academic knowledge center in the fields of maritime strategy, while focusing on the eastern Mediterranean and the Red Sea. The center's mission was determined to promote and perform interdisciplinary, innovative **academic research** on the fields of maritime policy and strategy in the broader sense, so as high-quality research on subjects of interest that are on the public agenda in the maritime field. Alongside academic studies to promote knowledge, the center also **provides political analysis**' policy papers and recommendations to decision makers, public leaders and the strategic research community in Israel, and encourages the public discussion on the subject. The center encourages new and independent thinking that will broaden, enrich and provide analysis infrastructure for institutional strategic thinking. The research fields were defined as knowledge development in the fields of maritime strategy, regional security and foreign policy, exchange of goods, people and ideas, law and marine cyber, energy and environment.

As part of the public dialogue in Israel on the subject of the maritime domain, HMS has set itself to write and publish an annual maritime strategic assessment that focuses on the area of the eastern Mediterranean and the Red Sea, yet also includes examining global developments and trends in the maritime field, that may have an impact on the Mediterranean in general and Israel in particular.

The report includes recommendations to various bodies in the Israeli government, as well as other players in the public domain. These recommendations do not compete with bodies who hold the responsibility and authority regarding the various maritime issues, but they provide a different outlook, liberated from the institutional restrictions and the day to day constrains as well as identifying long-term processes and trends.

The term "Contemporary Maritime Security" becomes more and more common in the world and it includes four main components (see Figure 1):

1. National level security
2. Personal level security
3. Economic development
4. The marine environment

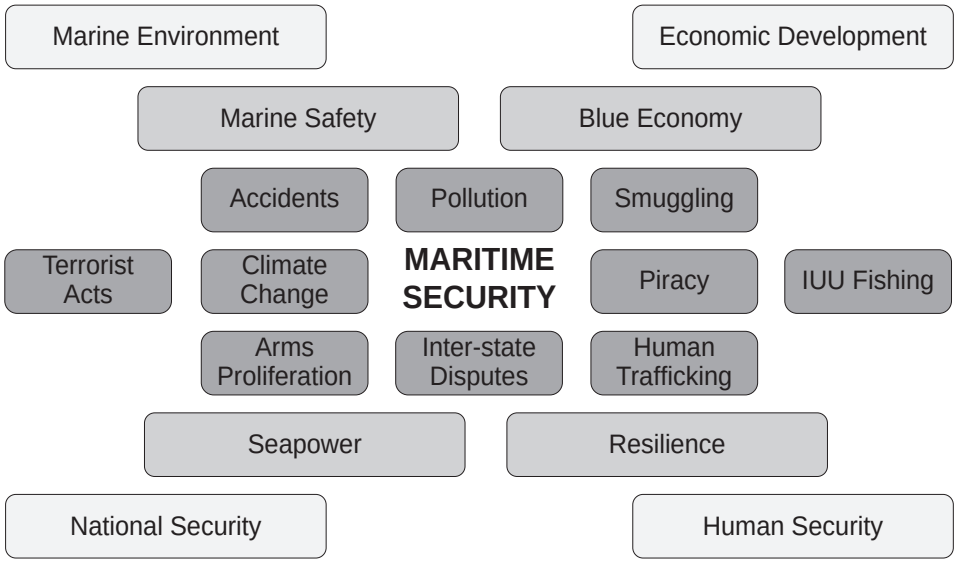

Figure 1: the topics included in contemporary maritime security

Unfortunately, decision makers and the Israeli public tend to mainly address national security aspects and the naval power that is “in the bottom left corner” in the table above, and are less aware of other aspects that are equally as important within contemporary maritime security.

The significance of the maritime domain as a component in the state of Israel’s resilience has not yet been noticeably recognized by the state’s captains and in public opinion in Israel. This is the case, for example, in the ministry of science’s committee that deals with national research and development subjects through ten subcommittees. There is no committee that deals with the maritime domain (for example there is a committee that deals with the subject of space). In the opening of the previous report we expanded upon the issue, and brought from the experience of other countries such as Portugal, that decided to change the situation, developed a suitable maritime strategy, and established new institutions to deal with this issue. This subject is not unique to Israel only, and from cooperation that the center has with similar thinktanks around the world it can learn from the experience of others on how to cope with this problem.

As part of dealing with the issue of lack of marine awareness in the state of Israel, we first launched in the year 2019 as part of The School of Political Science, The Department of International Relations at the University of Haifa**, a master’s degree program in political science with an appendix in studying national security and maritime strategy**. The program has been successful among its participants. In the

current school year, 2020, the program was re-opened while implementing the lessons learnt from the first year, and diversed its participants, both gender wise and sector wise. As part of the seminar the students took field trips to the port of Haifa, port of Kishon and Israel shipyards, Zim Company and others, and got insights and detailed interesting reviews from the leaders of the organizations they visited.

In 2017 the university has approved the joining of the Wydra Institute of Shipping and Ports as a division in HMS. Wydra Institute, which in the early nineties was a cornerstone in the University of Haifa for research on these issues according to the legacy of Naftali Wydra, has in fact ceased to exist, and the subject of trade and shipping in the age of globalization as a whole, that is expressed in academic research infrastructure, has disappeared from the Israeli institutes. Captain Alex Garson was appointed as the head of the division and Mr. Ehud Gonen, who is doing his dissertation about the subject of the China's belt and road initiative was appointed as research coordinator. In the center there are research colleagues with prior experience in the field such as Rear Admiral (reserve) Doctor Rona Arie, former head of shipping and port authority and Executive Officer in reserve Arie Gavish, who in his last position was the manager of Haifa port on behalf of Israel Ports Company. The division published in the last year calls for proposal for conducting academic research in this important field in order to attract young researchers to enter it.

A negative turn that occurred in 2019 with regard to the promotion of marine studies in higher education institutions in Israel was the Planning and Budgeting Committee and the Higher Education Committee's decision to stop/ reduce the budget of the Israeli Association for Mediterranean Study)MERCI). Without going into the reasons that led to this decision, including the way of managing the association by the University of Haifa, I feel that they shouldn't "throw the baby out with the bathwater", and it is required that an external steering committee that will review this decision again will be established on the behalf of the Council for Higher education in collaboration with the national academy of sciences.

On September 2019 HMS and the Hudson Institute issued a report based on a meeting held in August 2018 at the University regarding the subject of 'The Eastern Mediterranean in the New Era of Major-Power Competition: Prospects for U.S.-Israeli Cooperation'. The report includes recommendations on American security posture and Israel-US security cooperation relations, the foundation of the marine defense industry and civil shipping industry. The report also includes an appendix written by Admiral (reserve) Ami Ayalon and deals with the evolving nature of contemporary war and the influence of diplomatic, political, legal and military dimensions on it.

By the decision of the University of Haifa's management, as of December 1st 2019, the Azri Center for Iran and The Persian Gulf Research is incorporated into HMS. Azri Center will closely cooperate with the Department of Middle East and Islamic Studies at the University of Haifa, as well as with Reuven Chaikin Chair in Geostrategy and the Wydra Division for Shipping and Ports. The transformation of the Persian Gulf and the Arabian sea from peripheral areas to central geo-political, strategic and economic center- influences the area and international security in general, and maritime security in particular, allows HMS to incorporate the Azri Center, and to take advantage of the multidisciplinary nature of HMS, to cooperate with Azri division while performing a broad interdisciplinary observation on these developments, that undoubtedly influence our area as well.

From all the issues that discussed and arose from the annual maritime assessment reports and its recommendations, three subjects in particular stood up and received public and governmental attention:

- The plan to operate the Bay Port (next to Haifa port) by the Chinese company SIPG for 25 years came up in the joint report written by HMS with Hudson Institute. The issue was clarified with the National Security Council, including messages also conveyed by US agencies. Even though the decision was not change, at its meeting on October 30, 2019 the Cabinet made a decision governing the process and mechanism for examining foreign investments in Israel.
- Delineation of the maritime border between Israel and Lebanon – an extensive work regarding the subject was undertaken by HMS's researcher Dr. Beni Shpiner, and was presented to the minister of energy, Dr. Yuval Steinitz and the General Manager of his office who was appointed by the security cabinet to lead the handling of the matter on behalf of the Israeli government.
- The production rig of Liviathan field's new location – HMS published a comprehensive report for the local council in Zichron Yaakov exploring four possible alternatives to the issue and recommended an alternative within 30-40 km offshore. The highlights of the report were presented to the chairman of the foreign affairs and defense committee, member of the Israeli parliament, Avi Dichter, in his visit to Zichron Yaakov Council. The report presents a holistic method for choosing the location of energy infrastructures at sea while taking into account the various factors affecting the location itself.

In context of the work done on the subject of the location of the production rig of Liviathan it is worth mentioning, that none of the factors involved in the decision making process regarding the issue, did not make an overall assessment and presented alternatives and their meanings. Furthermore, the security establishment in Israel changed its position during the process and determined that in terms of protecting the production

facility the best location is as close as possible to the shore. This position did not hinder the security establishment from allowing the fields “Karish” and “Tanin” that are located in proximity to the border with Lebanon and within tens of miles from the shore to plan the production by various means (Floating production facility instead of a fixed production rig), and to transport the condensate to refineries outside of Israel. The whole process itself was accompanied by a lack of transparency towards the public and caused public unrest among the population living in the area of Zichron Yaakov.

This repeatedly indicated a phenomenon on which HMS has alerted since the day of its establishment, that is **long-term lack of planning that characterizes what is occurring in Israel’s maritime domain**.

HMS established cooperation with a number of thinktanks and institutes abroad and conducts periodic meetings and publishes joint policy documents and studies. Aside from the Hudson Institute from the US, HMS had a joint meeting with the Center for Maritime strategy in Toulon (FMES – Institu Mèditerranèen des Hautes ètudes Stratègiques), the Indian Maritime Strategy Foundation (National Maritime Foundation), and the school named after Rajaratnam for international studies (The S. Rajaratnam School of International Studies- RSIS) from Singapore.

The head of HMS and its researchers have been invited to participate in a number of international conferences/workshops this past year, that included a joint workshop about maritime terror, drugs and piracy held in May 2019 at The Royal Danish College on behalf of the NATO Science Foundation; The annual conference of The Indian National Maritime Foundation on the subject of Indian Ocean Regional Dialogue in which HMS’s researchers presented the issue of maritime cyber; The Austrian National College in June 2019 on the subject of strategic thinking (an der denken neu Strategie Landesverteidigungsakademie).

In the past year HMS has had a number of training courses and conferences for Navy departments, educators and public bodies. The lecturers on behalf of HMS did this work voluntarily. This includes the sponsoring of a group of scientists and engineers from the Commonwealth of Independent States, (CIS) who specialize in marine infrastructure projects. HMS assisted them in publishing their work and in holding a conference where their work was presented and discussed.

The future plans are to expand the activities by presenting policy papers for government and public bodies, and to deepen our involvement in the public dialogue regarding the subjects of the maritime area.

Shaul Chorev – Head of the Maritime Policy and Strategy Research Center (HMS)

The Indo-Pacific Region

Benni Ben Ari

About a decade ago, the term Indo-Pacific became part of the political lexicon in place of the term Asia-Pacific which had been used until then to describe the Asian-Pacific geostrategic region, in economic, geographic and diplomatic terms. The new region includes the Indian Ocean and its coastlines in the west, including the Red Sea and the Persian Gulf, and up to the central Pacific Ocean in the east and even up to the West Coast of the US. The region includes East and Southeast Asia and the northern coast of Australia.

The term Indo-Pacific appeared for the first time in an article by Captain Dr. Gurpreet S. Khurana of India on cooperation between India and Japan,[1] and in a national security document published by the Australian government in 2013, which declared that: "A new Indo-Pacific strategic region is beginning to emerge, connecting the Indian and Pacific Oceans through Southeast Asia."[2] This definition has been adopted by the US (Trump Administration, 2017) in order to describe the region of Asia as a whole without differentiating between East Asia and Southeast Asia; it includes the South China Sea, the Indian Ocean, all of the coastal nations (36 in number) and two oceans. The "Pivot to Asia" policy, which was adopted by US President Obama and whose name was changed to the "Indo-Pacific Pivot", involves the shift of US geostrategic, geopolitical and economic focus from the Middle East to Asia. The ASEAN[3] countries also adopted the definition at the Manila Conference of 2019.[4]

The significance of the new name for the region is the recognition of the growing economic, military and political importance of the Western Pacific and Indian Ocean, which constitute a single strategic unit. From a geographic perspective, it is essentially a "super-region" in which sub-regions are still important. The region includes a number of important choke points: the Strait of Hormuz, the Bab el Mandeb Strait and the Malacca Straits, the straits between the Indonesian islands and also the South China

1 Gurpreet S. Khuranathe, November 14,2017 'INDO-PACIFIC' CONCEPT: RETROSPECT AND PROSPECT, http://cimsec.org/indo-pacific-concept-retrospect-prospect/34710; Mercy A. Kuo, The Diplomat, January 25, 2018, The Origin of 'Indo-Pacific' as Geopolitical Construct. https://thediplomat.com/2018/01/the-origin-of-indo-pacific-as-geopolitical-construct

2 Nikhil Sonnad, Quartz, November 7, 2017 https://qz.com/1121336/trump-in-asia-all-about-indo-pacific-the-new-term-trump-is-using-to-refer-to-asia/

3 ASEAN: Association of Southeast Asian Nations.

4 Tashny Sukumaran, 24.6.2019, South China Morning Post, https://www.scmp.com/news/ 5 asia/diplomacy/article/3015892/whats-difference-between-indo-pacific-and-asia-pacificregional

Sea, which the Chinese have made into a "mega choke point" by means of fortified artificial islands. The region includes shipping lanes that are the route used to bring raw materials and energy products from its western part to its eastern part, as well as highly productive fisheries and energy resources and mines. The geostrategic theater as defined by the US military, which was previously the Asia-Pacific Command was expanded to become the Indo-Pacific Command. As part of the "radicalization" of the picture, it is also worth mentioning North Korea on the eastern outskirts of the region and Iran on the western outskirts.

Figure 1: The Indo-Pacific as a geostrategic region[5] and the choke-points in the region

Figure 2: The US Asia-Pacific Command was expanded to become the Indo-Pacific Command[6]

5 PROJECT UPSC, June 9, 2018 https://projectupsc.wordpress.com/2018/06/09/indo-pacific-area-should-be-inclusive

6 Angelo Vijaya, 21 Jan 1018, Reconfiguring Foreign Policy Focus: time for an Indo-Pacific 9 region? https://medium.com/@angelowijaya/refocusing-strategy-time-for-an-indo-pacific region-deae9b1ba6d1

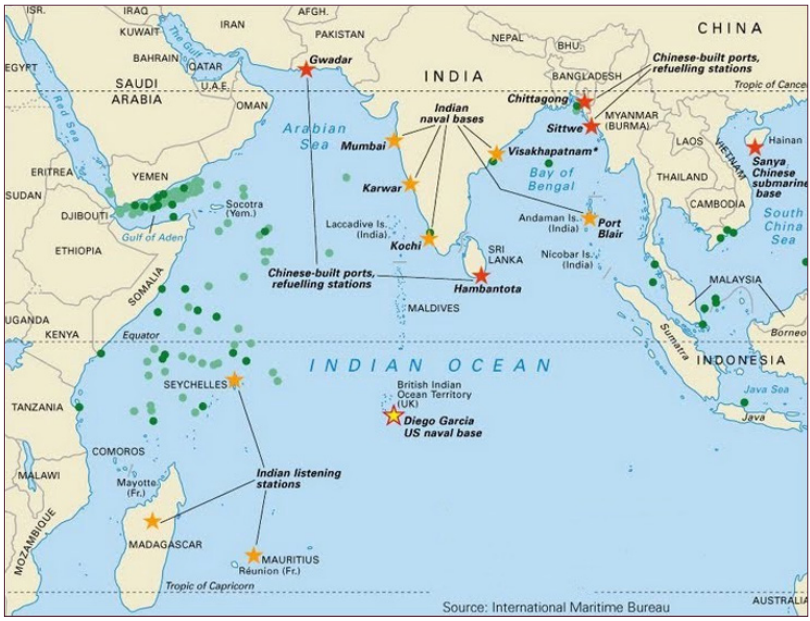

Figure 3: The presence of the superpowers in the Indian Ocean[7]

The rapid economic growth in China, India and other countries in the Indo-Pacific region means that the race to control and defend the (primarily commercial) sea routes and the demand for the ocean's resources, including energy, fishing, infrastructure, industry, etc., will continue. These assets emphasize the global importance of the Indo-Pacific region and reinforce the uniqueness of maritime factors in global political and economic affairs. This is based on the fact that the Indo-Pacific is perceived primarily as a maritime region[8] which connects two oceans by way of its main commercial route, namely the Malacca Straits, and which is influenced by the increased Chinese presence in the area on the one hand and the effort to renew the US network of alliances with the countries of the region, on the other hand.

The Indian Ocean region

The Indian Ocean, which is at the center of the region, constitutes an important and sensitive economic, political and military arena. Through this area flows the supply of energy from the Middle East to East Asia and it also includes the main trade routes between Asia and Europe. The region is complex and difficult to control and monitor

7 Ibid.

8 Rahman, C. (2011) "The Geopolitical Context" in Indo-Pacific Maritime Security in the 21st Century Ed. Thomas G. M. US Naval War College and Lowy Institute for International Policy : 1-10

due to the increased activity of the naval superpowers (the US, China and India) and the appearance of second- and third-tier players (France, Britain, Japan, Australia, Indonesia, Pakistan, Iran and others), which have maintained activity in this increasingly important region. Although the region's name implies the importance of India's position in the new region, the main players are in fact the US and China. In a meeting between the leaders of the US, India, Japan and Australia[9] in November 2017, President Trump used the term Indo-Pacific as a hint to the intention of the US and its allies to increase their efforts to counter the growing activity of China in the region.[10]

The Indian government does not view the countries of the region as belonging to an exclusive club and it is active in expanding the dialogue between the countries in order to achieve broader agreement with the vison of making the region into a free economic zone from the coasts of Africa to the Western Pacific, with the goal of building a barrier against Chinese regional hegemony.[11] In 2015, the Indian navy published its new naval strategy in which its "area of interest" was expanded to the entire western and southwestern parts of the Pacific Ocean.[12] India has increased its political and military activity in the Indian Ocean, including the strengthening of ties with small countries at the western entrance to the Indian Ocean, including Mauritius, the Seychelles Islands and Oman, as well as its activity in the eastern part of the Indian Ocean, and primarily in the Malacca Straits, which is undoubtedly a response to China's increased naval activity in the Indian Ocean.[13] As part of this policy, India sees itself as a country that will essentially control the Malacca Straits and therefore the Indian Navy declared in 2017 that it would maintain a permanent presence there.[14]

9 Quadrilateral Security Dialogue.

10 The Times of India, November 2017, Quadrilateral Security Dialogue: India, Japan, Australia, US held talks on Indo-Pacific Cooperation. https://timesofindia.indiatimes.com/india/quadrilateral-security-dialogue-india-australia-japan-us-hold-talks-on-indo-pacific-cooperation/articleshow/61616602.cms

11 Swaran Singh, July 9, 2018, Asia Times, Is India shifting the goalposts in Indo-Pacific debate? http://www.atimes.com/is-india-shifting-the-goalposts-in-indo-pacific-debate

12 See Benni Ben Ari, *Maritime Strategic Evaluation for Israel 2016*, Shaul Chorev and Ehud Gonen, (eds.), pp. 48-63.

13 Mercy A. Kau, January 25, 2018, The Diplomat, The Origin of 'Indo-Pacific' as Geopolitical Construct https://thediplomat.com/2018/01/the-origin-of-indo-pacific-as-geopolitical-construct

14 Ajay Banerjee, 2017, Indian Navy looks to dominate Malacca Straits. https://www.tribuneindia.com/news/nation/indian-navy-looks-to-dominate-malacca-straits/421162.html

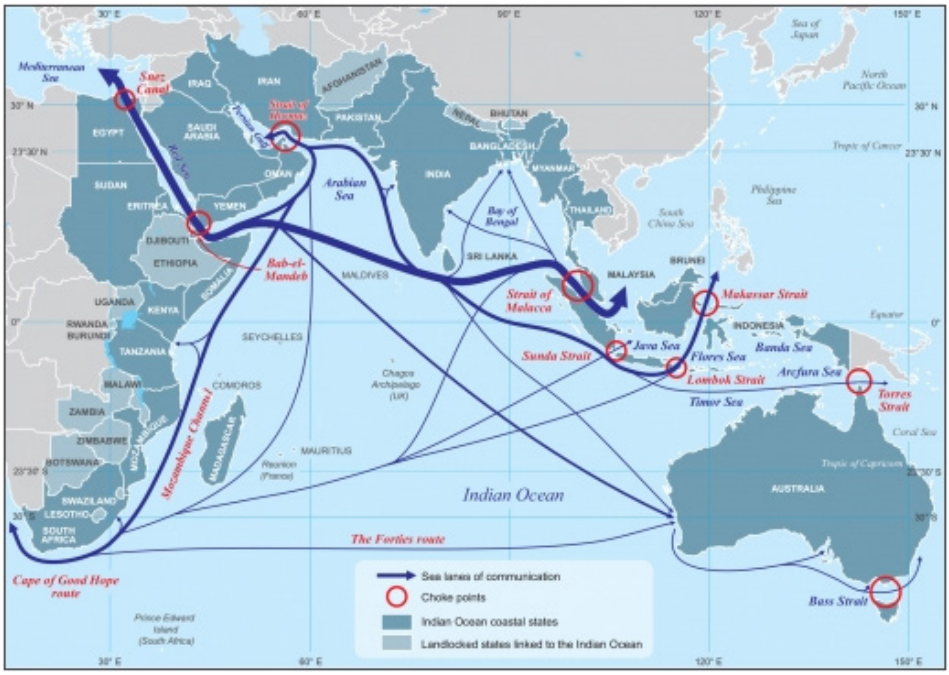

Figure 4: Shipping routes in the Indian Ocean[15]

China has increased its military activity in the region, an effort that began with the creation of a naval base in Djibouti (2017), and it intends to establish bases in Gwadar and Jiwani in Pakistan and at Hambantota in Sri Lanka. Additional bases will apparently be established at Kyaukpya in Myanmar, at Bagamoyo in Tanzania, at Gan in the Maldives Islands and at other locations in the central and western Indian Ocean.[16]

Other countries with political, religious, commercial and strategic interests are making military moves in the region. These include Saudi Arabia which has established a military port at Djibouti and has shown interest in Comoros Islands and in the Maldives Islands; the United Arab Emirates (UAE) which has established a military port and airport at Assab in Eritrea and a training base at Mogadishu in Somalia; Turkey which has signed an agreement with Sudan to rebuild the Ottoman port of Suakin on the Red Sea, which is in addition to the military bases and forces in Qatar and Mogadishu and

15 Denis Venter, 2017, India and Africa: Maritime Security and India's Strategic Interests in the Western Indian Ocean https://books.openedition.org/cei/469

16 David Brewster, The Interpreter, 30 January 2018' China's new network of Indian Ocean bases. https://www.lowyinstitute.org/the-interpreter/chinas-new-network-indian-ocean-bases; David Brewster, The Maritime Executive, 15 May 2018, China's Play for Bases in the Indian Ocean. https://www.maritime-executive.com/editorials/china-s-play-for-bases-in-the-indian-ocean

the support of the Muslims in Myanmar; Egypt which is reinforcing its naval forces in the Red Sea; and Iran which is focusing on the Persian Gulf.[17]

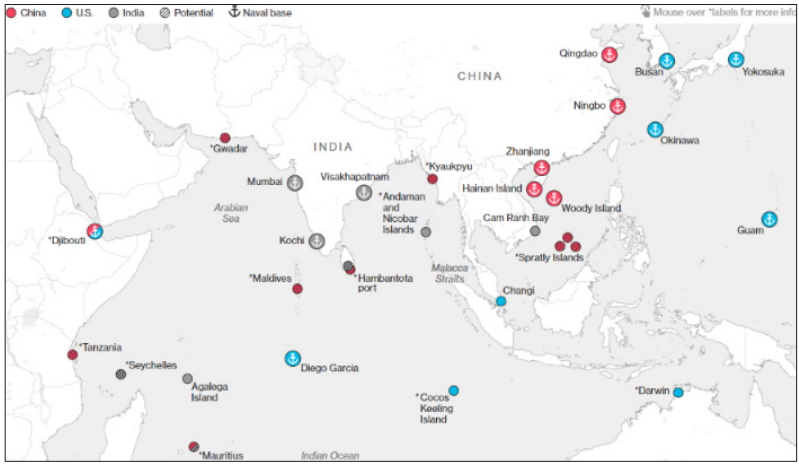

Figure 5: The deployment of naval bases in the Indian Ocean[18]

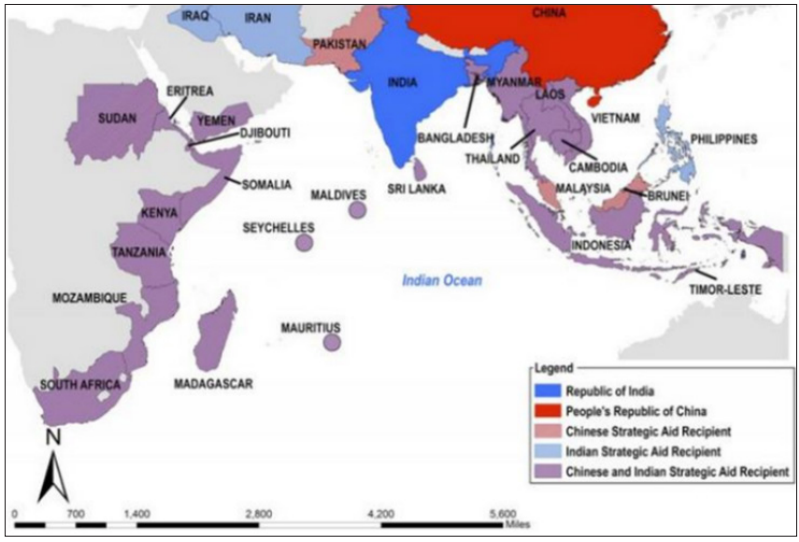

Figure 6: India's and China's areas of economic and political interest in the Indo-Pacific[19]

17 Ibid.

18 David Tweed and Adrian Leung , Bloomberg, 7 May 2018, China Is Making a Bold Military Power Play. https://www.bloomberg.com/graphics/2018-china-navy-bases

19 Rani Mullen & Cody Poplin, 30 September 2015, The Battle for Access and Influence in the Indo-Pacific. http://www.correlationmatrix.ca/2015/09/rani-mullen-and-cody-poplin-on-battle.html?m=1

The South China Sea

There is no doubt as to the economic and strategic importance of the South China Sea to all of the countries along its coasts and to international maritime trade. The South China Sea is more than 1450 miles long and 800 miles wide with an area of about 1.4 million square miles. The maritime trade that passes through it in a year has a value of more than $5 trillion. About 11 billion barrels of oil and huge amounts of natural gas are located under its seabed and it accounts for about 12 percent of global fish production.

According to the assessments of the United Nations Conference on Trade and Development (UNCTAD), about 80 percent of global trading volume and 70 percent of its value are seaborne.[20] About 60 percent of this amount is by way of Asia and about one-third of all global sea transport is by way of the South China Sea, which is of critical importance to China, Taiwan, Japan and South Korea, whose imports arrive by way of the Malacca Strait.[21]

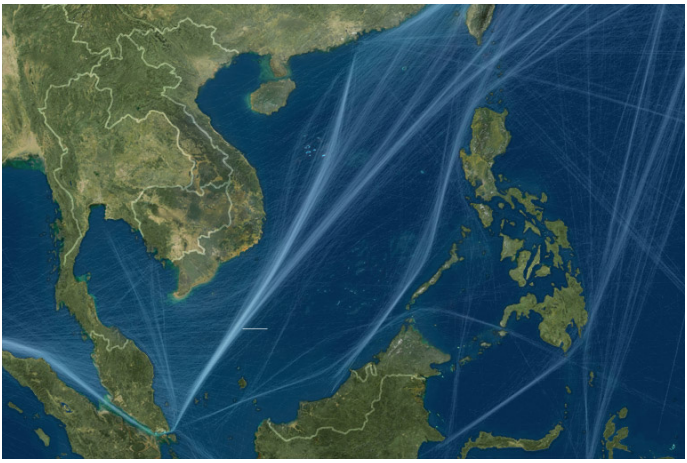

Figure 7: The volume of shipping routes in the South China Sea[22]

For a number of years now, China has been aggressively reinforcing its ability to project power with respect to both commercial shipping and its naval forces. In contrast to the naval presence and projection of power on the shipping routes and the establishment

20 UNCTAD Review of Maritime Transport 2018. https://unctad.org/en/Pages/Publications/Review-of-Maritime-Transport-(Series).aspx

21 China Power 2016, How much trade transits the South China Sea? https://chinapower.csis.org/much-trade-transits-south-china-sea

22 JEFF HIMMELMAN, New York Times 2016, A Game of Shark and Minnow http://www.nytimes.com/newsgraphics/2013/10/27/south-china-sea/index.html

or purchase of ports around the world, the demand for sovereignty over most of the South China Sea and the establishment of military positions on the artificial islands is an unprecedented geostrategic move.

Figure 8: The Nine-Dash Line – Chinese demands for sovereignty in the South China Sea[23]

China, which is demanding sovereignty over most of the South China Sea, on the basis of the "Nine-Dash Line",[24] has been investing effort since 2012 in creating facts in the South China Sea by building seven artificial islands on reefs and shoals and arming them. Some of the islands are located more than thousand kilometers from China's coast. The aggressive Chinese activity to prevent Philippine fishing in the area of the Scarborough Shoal led to the Philippines submitting a claim against China in the International Court in the Hague.[25] The verdict, which was handed down in July 2016 on the basis of the Law of the Sea 1982 (UNCLOS), unanimously rejected China's claims to sovereignty, which were based on historical arguments and old naval maps.[26] China continued carrying out its plans nonetheless and the islands became military positions for all intents and purposes, despite the repeated complaints and the promise

23 Todd Crowell, August 2015, Anadulu Agency, all you need to know about the South China Sea dispute, https://www.aa.com.tr/en/politics/all-you-need-to-know-about-the-south-china-sea-dispute/19877#

24 Wai Fu, 2015, How the Eleven-Dash Line Became a Nine-Dash Line, https://www.rfa.org/english/commentaries/line-07162015121333.html

25 ISDP, June, 2016, pp. 8, Understanding China's Position on the South China Sea Disputes, http://isdp.eu/publication/understanding-chinas-position-south-china-sea-disputes

26 Chris Whomersley, June 2016, Chinese Journal of International Law, The South China Sea: The Award of the Tribunal in the Case Brought by Philippines against China—A Critique, https://academic.oup.com/chinesejil/article/15/2/239/2548385

by Chinese President Xi that the construction of the islands and the facilities on them are meant to ensure the safety of civilian shipping and to provide shelter to fisherman during storms.[27]

China is exploiting its position of power relative to most of the countries involved, most of which are members of the ASEAN organization, and is behaving according to the principles of "Asian Culture" in its decision-making, foreign policy and negotiating strategies.[28] China continues to reject the court's verdict and is successfully sticking to its negotiating position with each of the countries involved. "Asian culture" is familiar to the countries bordering on the South China Sea, and therefore China has recorded achievements and has in practice implemented its demands for sovereignty, despite the policy of the West, led by the US, which is continuing to demand compliance with the 2016 verdict. The only real US response is to carry out patrols from time to time to ensure freedom of passage (known as FONOP – Freedom of Navigation Operations), to which the Chinese have reacted with diplomatic protests. As part of the talks and discussions with the various countries, and in particular the Philippines and Vietnam, China has managed to almost completely reverse the opposition to its moves and has thus made major geopolitical and geostrategic achievements by means of agreements for cooperation and economic aid. The President of the Philippines who has changed his position several times has stated that "he will go to war against China, perhaps in the year 4001…"[29] and in January 2018 he stated that: "The efficacy of sovereignty patrols is an American problem since the Philippines has other tactics for managing the conflict and dealing with China."

Already at the end of 2017, there was clear evidence that the artificial islands are essentially military positions which include landing runways and naval bases that are equipped with early warning systems, electronic warfare systems, anti-aircraft missiles and anti-ship cruise missiles and command and control systems (which are certainly

27 Richard A. Bitzinger May 10, 2018 Why Beijing is militarizing the South China Sea, http://www.atimes.com/why-beijing-is-militarizing-the-south-china-sea; Agence France-Presse, 21 May 2018 ,ABS/CBN News, Beijing denies 'militarization' of South China Sea http://news.abs-cbn.com/overseas/05/21/18/beijing-denies-militarization-of-south-china-sea

28 See the expanded article by Benni Ben Ari "The conflict in the South China Sea – the influence of Eastern culture on events, developments and outcomes", Chaiken Chair of Geostrategy and the Maritime Policy and Strategy Research Center, 2018, University of Haifa. [Hebrew]

29 Genalyn Kabiling, 5 July 2018, Manila Bulletin, Duterte says: No war with China; perhaps in year 4001, https://news.mb.com.ph/2018/07/05/duterte-says-no-war-with-china-perhaps-in-year-4001; Alexis Romero, The Philippine Star, 19 June 2018, Duterte wants China out of West Philippine Sea, but no war, https://www.philstar.com/headlines/2018/06/19/1825891/duterte-wants-china-out-west-philippine-sea-*no-war#xhTot83PvzZJwIyW.99

not intended to ensure the safety of civilian shipping or to provide shelter to fishing boats against the weather). This situation did not prevented China from continuing to deny the military character of the islands, until at some point, they hinted at an "admission" in semi-official statements that indeed the artificial islands and the installations on them are for military purposes.[30] As of the end of 2019, it appears that the improvement in the intelligence systems on the artificial islands is continuing, as revealed by the discovery of an observation balloon (Aerostat) on the Mischief Reef Island.[31]

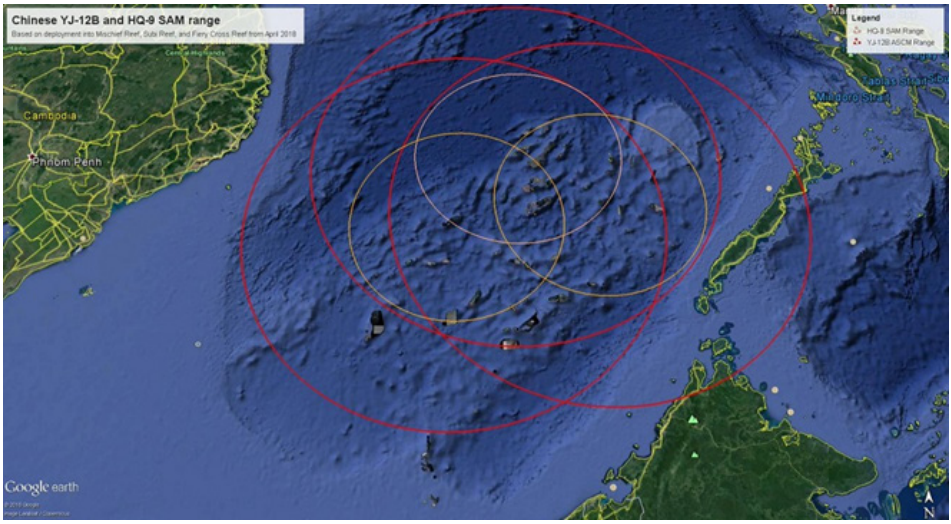

Figure 9: Chinese military installations on the artificial islands in the South China Sea. Missile ranges against ships (red) and against aircraft (yellow). Google Earth image via twitter user Dr. Malcom Davis.[32]

The recognition of the situation as a "fait accompli" has led the navies of Britain, France and Australia to participate in freedom of navigation patrols, and other countries in

30 Steven Stashwick, 25 January 2018, The Diplomat, China Signaling it May Finally 'Militarize' the South China Sea Officially https://thediplomat.com/2018/01/china-signaling-it-may-finally-militarize-the-south-china-sea-officially; Steven Stashwick, 14 June 2018, China's New Missiles in the Spratlys May be a Turning Point. https://thediplomat.com/2018/06/chinas-new-missiles-in-the-spratlys-may-be-a-turning-point

31 Joseph Trevithick, 2 December 2019, Chinas New Surveillance Blimp in The South China Sea 37 Is Likely Just The Beginning https://www.thedrive.com/the-war-zone/31279/chinas-newsurveillance-blimp-in-the-south-china-sea-is-likely-just-the-beginning

32 Navy Recognition, 4 May 2018, China Deploys YJ-12B and HQ-9B Missiles on South China Sea Islands http://www.navyrecognition.com/index.php/news/defence-news/2018/may-2018-navy-naval-defense-news/6190-china-deploys-yj-12b-and-hq-9b-missiles-on-south-china-sea-islands.html

the region, and in particular Vietnam, have reinforced weapons systems on their own islands;[33] at the same time, China and Japan have expanded their naval activity in the region.[34]

The "strategic solution"?

Simultaneously with the expansion of the geostrategic region, the Indo-Pacific was redefined by President Trump in 2017 as the Free and Open Indo-Pacific (FOIP), which is based on three pilars: 1) promotion and establishment of the rule of law, freedom of navigation, free trade, etc.; 2) pursuit of economic prosperity (improving connectivity and strengthening economic partnerships including EPAs/FTAs and investment treaties)"; and 3) commitment for peace and stability.[35] The US has given the region top priority in its foreign policy and has confirmed its deep commitment to the countries in the region through investment, maintenance of existing alliances and continuing development of the region's resources.[36] Figure 10 describes the initial intentions of the US declaration from an economic standpoint.

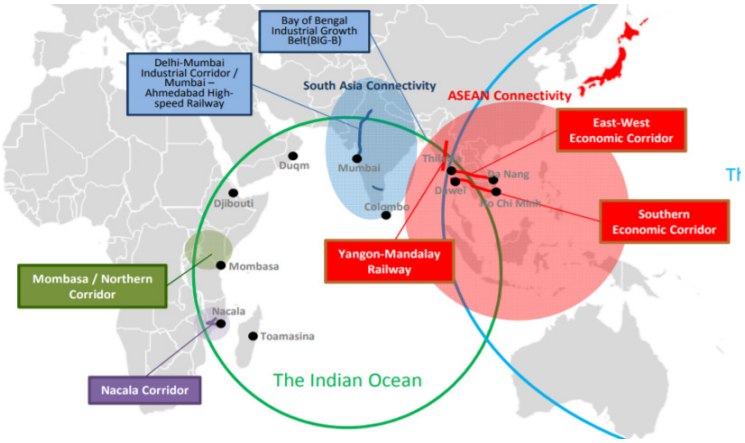

Figure 10: Improvement in relations with Asia, the Middle East and Africa.[37]

33 Naval Today, 6 June 2018, France, UK announce South China Sea freedom freedom-of-navigation-operations, https://navaltoday.com/2018/06/06/france-uk-announce-south-china-sea

34 Reuters., Oct 07, 2018, China, Japan navies extending reach in Indo-Pacific region. 40 https://www.reuters.com/investigates/special-report/china-army-navy

35 Based on the accomplishments of the Abe Administration, Japan intends to further improve and expand these diplomatic concepts A New Foreign Policy Strategy, August 2019: "Free and Open Indo-Pacific Strategy" https://www.asean.emb-japan.go.jp/files/000352880.pdf

36 USA Department of State, 4 November 2019 https://www.state.gov/wp-content/uploads/2019/11/Free-and-Open-Indo-Pacific-4Nov2019.pdf

37 See 35

But since the definition of the new region and the declaration of the FOIP policy, there has been an evident change in relations between the US and the Indo-Pacific countries, which has been manifested in a reduction in traditional cooperation and in the US commitment to the countries in the region.[38]

As a result of the changes and developments in the South China Sea and the Indian Ocean, a mechanism was created in 2007-2008 at the initiative of the US, Australia, India and Japan for the coordination of policy and strategy by means of the Quadrilateral Security Dialogue (QUAD). The organization was not active after its founding and was "reactivated" only in 2017.

Although the organization's goals and strategies are not completely clear or fully agreed-upon, it is reasonable to assume that it will follows three main principles: 1) To strengthen and reinforce the regional order based on the existing system of laws; 2) To promote a liberal trade regime and freedom of navigation; 3) To provide guarantees of mutual security in the region.[39]

All of the countries in QUAD, as well as the rest of the countries in the region are experiencing "problems and obstacles" originating with China,[40] which views the renewal of QUAD and the implementation of its new/old strategy as a direct threat and is responding in its characteristic way against each of the participants, by means of economic and political pressure. The success of the strategy as a security arrangement will depend on the answer to the following question: Can the potential partners withstand pressure from China? The US is in a trade war with China and at the same time is in nuclear disarmament negotiations with North Korea. The US must talk to China on both of these issues, a situation that will make it difficult to aggressively pursue the strategy for the new region. At this stage, it appears unlikely, despite the new geostrategic definition, that the US will make any significant changes in its policy toward Asia.

France also attributes great importance to the region in view of its territorial, geographic and political presence in the region (93 percent of France's Exclusive Economic Zone

38 Elliot Silverberg and Matthew Sullivan, 1 October 2019, The Diplomat, https://thediplomat.com/2019/10/assessing-trumps-indo-pacific-strategy-2-years-in

39 Ministry of Foreign Affairs of Japan, November 15, 2018, Japan-Australia-India-U.S. Consultations, https://www.mofa.go.jp/press/release/press1e_000099.html; Ministry of Foreign Affairs of Japan, 31 May 2019, Japan-Australia-India-U.S. Consultations, https://www.mofa.go.jp/press/release/press4e_002464.html

40 Mark J. Valencia, The Diplomat, 30 March 2018, What Does a 'Free and Open Indo-Pacific' Actually Mean? https://thediplomat.com/2018/03/what-does-a-free-and-open-indo-pacific-actually-mean

– EEZ is located in the Indo-Pacific region).[41] China's Belt and Road Initiative (BRI), the regional strategies of Australia, Japan and India and the importance of the ASEAN organizations all create new issues and opportunities for France, as well as for other EU countries.[42]

Since the beginning of 2019, Britain has also increased its naval presence in the region, including the passage of warships through the Taiwan Straits and of course in the South China Sea, as well as joint exercises with the US navy. However, for a change, the British are not crossing the territorial maritime boundaries declared by China for the South China Sea islands.[43]

Figure 11: France's presence in the Indo-Pacific region[44]

41 France is rooted in the southern part of the Indian Ocean with the islands of Mayotte and La Réunion, the Scattered Islands and the French Southern and Antarctic Territories. France is also anchored in the Pacific Ocean with its territories in New Caledonia, Wallis and Futuna, French Polynesia and Clipperton Island. http://www.defense.gouv.fr/content/download/475376/7615622/file/201606-PlaquetteAsiePacifiqueEN.comp.pdf

42 The Indo-Pacific region: a priority for France, https://www.diplomatie.gouv.fr/en/country-files/asia-and-oceania/the-indo-pacific-region-a-priority-for-france

43 Teddy NG, British navy vessel passes through Taiwan Strait, South china Morning Post, 7 December 2019, https://www.scmp.com/news/china/diplomacy/article/3041076/british-navy-vessel-passes-through-taiwan-strait

44 France and security in the Asia-Pacific, http://www.defense.gouv.fr/content/download/475376/7615622/file/201606-PlaquetteAsiePacifiqueEN.comp.pdf

China's activities in the Indo-Pacific region, in both the South China Sea and the Indian Ocean, are evidence of its determination to develop an economic and military strategic presence in the commercial shipping lanes between China, Africa, the Persian Gulf and Europe.

The QUAD mechanism is still not ready for implementation. All of the countries involved in the new strategy have their own reasons for operating in the region, in addition to the main one, i.e. the attempt to block China's growing influence in the region, an effort that is being led by the US.

Japan "likes" the definition since it is in line with its desire for a larger role in Asia and the Indo-Pacific region and the new definition of the region is much broader and extends beyond the bilateralism of the US alliance.

Australia has a goal of widening its understanding and political involvement in the region. India is adopting the Indo-Pacific concept because it respects India's essential role in the future of Asia.

Indonesia supports it in view of its location in the middle of the region. The ASEAN countries are concerned, even though they are located at the geographic center of the region, that they are not part of the organization and the concept, but are being dragged by "a fashionable usage that is spreading quickly."

The US is pushing the discussion and it feels like there is a strategy here.[45] At the 7th Reagan National Defence Forum in California in September 2019, the US Secretary of Defence stated that he will return American forces to the Indo-Pacific Command and will reinforce them because he foresees higher American priority for the region. Most of the ASEAN countries want a continued US presence but do not want to choose sides and thus get caught in a rivalry between the US and China and they prefer that the two superpowers be involved, including other forces.

Conclusion

The multiplicity of major players and participants in the region is evidence of its importance, though it also hinders the ability to reach an agreed-upon policy. The FOIP, which is meant to balance between commerce, defense and policy, was of course received and interpreted differently by each of the countries in the region. The ongoing conflict between China and the US over hegemony involves other players, such as Japan, India, Australia, France, Britain, the ASEAN countries and perhaps also Russia,

45 Graeme Dobell, The Strategist, 5 Jun 2018, Indo-Pacific versus Asia–Pacific as Mackinder faces Mahan https://www.aspistrategist.org.au

and complicates the picture since many of these countries have important interests that involve China. Small countries must exercise caution in their negotiations with the large forces. For example, even though the general trend is to block China from taking control, the ASEAN countries include China in their definition of the region, in accordance with the organization's principles ("The ASEAN Way"), which is to be interpreted according to "Asian culture"…[46] The political and military dynamic will continue to exist in the future, including a growing presence of the involved players and others. The new situation that is taking shape is "The New Great Game".

Thus, the definition can be assessed theoretically against two old and opposing opinions – that of John Mackinder vs that of Alfred Mahan,[47] a comparison made by the Australian journalist Graeme Dobell.[48] The land component in the definition of Asia-Pacific and the Chinese understanding of its meaning rests on Mackinder's theory from 1904 with regard to the global importance of the Euro-Asian land mass. The definition of the strategy on the basis of two oceans undoubtedly fascinated Alfred Mahan (whose 1890 book on naval history still serves as a textbook of naval strategy). Mackinder would have apparently understood the importance of trade and China's initiative in establishing a land Silk Route, while Mahan would have saluted the symbolism and intention of the US navy declaration (in May 2018) that the US Command in the Pacific Ocean is to be called the "Indo-Pacific Command".

46 Mie Oba, The Diplomat, 17 July 2019, ASEAN's Indo-Pacific Concept and the Great Power Challenge https://thediplomat.com/2019/07/aseans-indo-pacific-concept-and-the-great-powerchallenge

47 Alfred Thayer Mahan (1840–1914) was an admiral in the US navy, a geostrategist and a thinker in the theory of sea power. His thinking on the impact of naval power on history and on a country's political and economic power has had a major influence on decision makers in navies around the world and it encouraged the navel arms race that preceded the First World War. Mahan is considered to be one of the most important military-naval thinkers and is viewed as the "naval Clausewitz". His most important book *The Influence of Sea Power on History 1660-1783* was published in 1890. Sir Halford John Mackinder (1861–1947) was a British geographer who is considered to the father of geopolitics and geostrategy and inventor of the theory of the Geographical Pivot of History. In 1904, he gave a lecture to the Royal Geographic Society and presented his theory of "The Geographical Pivot of History", which describes a world divided into regions according to geographic characteristics. Mackinder claimed that this division to a large extent shapes the political ideologies and strategies of the populations in those areas, which is a kind of geographic determinism.

48 Graeme Dobell, 5 Jun 2018, The Strategist, Indo-Pacific versus Asia–Pacific as Makinder faces Mahan https://www.aspistrategist.org.au/indo-pacific-versus-asia-pacific-as-makinder-faces-mahan; Graeme Dobell has been reporting on Australian and international politics, foreign affairs and defence, and the Asia Pacific since 1975. He is Journalist Fellow with the Australian Strategic Policy Institute, writing for ASPI's blog, The Strategist, https://www.aspi.org.au/bio/graeme-dobell

The Indo-Pacific is a maritime concept while the Asia-Pacific concept attempts to connect the oceans with the continent. The Indo-Pacific concept does not include the land mass of Asia (primarily China) and replaces the continent with the two oceans.

The translation into policy may be "India is India" but "the Pacific is the US". Such a policy reinforces Chinese paranoia since it is contained by and limited by two oceans and lies between the US on one side and India on the other, and in the case of conflicts with India in the modern era, China's experience has been on land, rather than at sea.

The outskirts of the Indo-Pacific region reach to the Israeli coast in the south in the area of the Gulf of Eilat (the region including the Red Sea). The uncertainty as to the US position in the Indian Ocean and the activity of a multiplicity of players, some of which are hostile to Israel (such as Iran) and some of which are friends (such as the US and Australia), and many others who are in between, make this a complicated region from a geostrategic viewpoint. The ambitions of the various countries to achieve control, including in the Red Sea, should be a focus of interest, attention and evaluation by Israel on an ongoing basis.

The Russian navy – central trends in 2019 and their implication in the Middle East

Ido Gilad

Background

During 2019 Russia continued to deepen its hold on the Middle East, expanding arms distribution and extending its presence in various points of interest. Syria continued to serve as a prominent Russian base, by the support of both Iran and Turkey. Russian maritime presence was evident in the Persian Gulf as well, either with Iran, or by links developed with other regional states, led by Saudi Arabia. In North Africa, Russia's involvement was highlighted in Libya. Together with key partners as Egypt and Saudi Arabia all supported the opposition forces led by general Khalifa Haftar, whose forces were already close to the capital Tripoli – the stronghold of Libyan Islamist consent government. The UN as West counties supported this government, significantly by Turkey. The two rival Libyan parties agreed to participate in Russia's led of the 'Africa Summit' in Sochi in October 2019. President Putin pointed over the need to prevent movements of Islamic terrorists from Idlib in north Syria to Libya, to take part in the decisive battles over Tripoli. This argument could serve among the reasons for Russia to justify its involvement in Libya, delivering also the Europeans a note, with the hazard by the terroristic potential advantage to get closer to Europe.[1] North African coast, allowed Russia also to tighten its relations with Egypt and Algerian governments. In the global arena, Russian collaborations with China has expanded, perhaps towards a potential alliance between these superpowers. In case of such a realization, impacts would affect the region, as its maritime sphere.[2]

These trends were reflected by the Russian Foreign Minister Sergey Lavrov's speech in the Valday Conference (October 3, 2019), held in Sochi. He attributed also to the key denominator that characterizes the Middle East now times, and evidentially is linked to the US's constant departure from the region.[3]

General naval trends in the maritime sphere

The maritime sphere represented along 2019 the Russian diplomacy at its best. Russian 'flag display' dimension, demonstrated its political power as a tool to create relationships with fellow countries as cooperation with other navies.

1 Putin / Press Conference at the BRICS summit in Brazil from November 14, 2018 in: http://rt.com

2 See footnote 4 below about joint trainings between the two navies.

3 Russian foreign ministry website, from October 2, 2019. https://www.mid.ru/en/web/guest/foreign_policy/international_safety/conflicts/-/asset_publisher/xIEMTQ3OvzcA/content/id/3826083

These activities allowed Russia to project military power, naval and regional security, and even a sense of a significant responds towards existing or potential natural disasters, or manmade ones (as if terrorism, piracy, save and rescue measures, provide a welfare to immigrants and more). Russian navy ships illustrated such dimensions within presence and visits over various ports, in some maneuvers and trainings with the host fleets took place. Among the cruises held along 2019, two significantly represent this approach. One led by the command of “Marshal Ustinov" missiles cruiser from the Northern fleet; the other by the command of “Yaroslav Mudry" frigate from the Baltic fleet.

1. The "Marshall Ustinov" cruiser force (Figure 1) a "Slava" model sailed away from home port in Severomorsk escorted by two auxiliary vessels in early July 2019. After participating in the Russian Naval day, the force proceeded sail towards the Mediterranean. Visits held in ports of Algeria, Egypt, Turkey, Greece and Cyprus. Then through the Atlantic Ocean the flotilla stopped in various ports in West Africa before the arrival to South Africa's port of Cape Town, where, for the first time, a joint maneuver with the local host navy and the Chinese Navy took place. The Russian force resumed northbound the Suez Canal over the Black Sea to Sevastopol port on December 25, 2019 and was integrate in a maneuver held there in early January 2020.

Figure 1: “Marshal Ustinov” cruiser, Slava class[4]

4 Russian news agency TASS, October.

2. From the Baltic fleet, the frigate "Yaroslav Modri" a "Nosratshimi" model class led two other auxiliary vessels, departed on October 1, 2019 from Baltiysk port in Kaliningrad region. First sail destination was the Mediterranean, in where visits occurred in Tartus, Pireaus and Limassol ports. Then the force continued southbound in the Suez Canal for a participation in the “Indra” maneuver held by the Indian navy and occurred for the first time in the Indian Ocean (December 10-19, 2019). Chabahar port in Iran was the next destination as it hosted the first four days naval maneuver joined by the Chinese navy, as well as the Iranian host navy (December 27-30, 2019).[5] Maneuvers held in the Gulf of Oman, and the eastern access to the Straits of Hormuz. Thus, in fact, the event demonstrated a great oppositional power towards President Trump’s intentions to set up a US-led coalition in the region (was initiated first 6 months earlier).

Russian navy has been prioritizing by president Putin, its equipment and procurement planning in the upcoming decade .The president promoted the military and defense industries, as well as Russian shipyards, to produce and supply marine platforms with preferred 3M22 Zircon supersonic marine missiles systems. The minister of defense had commented (December 24, 2019),[6] that the missiles integration will be focused on five new sea crafts, to be operated during 2020. Other systems should become upgraded too in Naval existing platforms.[7] In general, Putin views these technological projects as the heart of the navy’s future development, and as a catalysator to the entire Russia's developmental and scientific achievements as well as contribution to the nation's economy, either militarily or civilian. These industry bodies (military, civilian and shipyards) serve Russian needs as happens frequently in other countries, too.

5 The Russian news agency TASS, about the Ustinov cruiser, December 1, 2019, https://tass.com/defense/1094465 , as well as December 25 2019, https://tass.com/defense/1103407 . The Russian news agency about the frigate Mudri, December 25 2019: https://tas.com/defense/1103441 . Joint maritime maneuver for Russia, China and Iran- from Chabahar port in the Gulf of Oman and the Straits of Hormuz’s exit: see a video from Ruptly from December 27, 2019, https://www.youtube.com/watch?v=NUsjvcH2GQc

6 Statement by the minister of defense Shoygu, December 24, 2019, https://tass.com/defense/1103059

7 The missile is for the range of up to 1,000 km, with a speed of about 8 mach, and can be launched from surface sea crafts and submarines and can be armed with nuclear weapon. In the annual state of the nation speech in 1.3.2018, Putin mentioned the Zircon missile as one of six weaponry system with a nuclear potential, including supersonic torpedo. These missiles are intended for hitting coastal and maritime targets and will be incorporated in operational activities, probably in the upcoming decade, and will express a development and intensification of the “Caliber” missiles that have long been deployed against targets in Syria by the Russian navy.

Figure 2: from the Russian navy development forum[8]

Putin empowered navy's historically important role and the contribution of it to maintain Russia's security as global interests.[9] He also added[10] that during 2019 a variety of Russian marine operations took place and included 111 cruises. Some related to shipping protection as piracy as terror prevention missions. These operations contained 70 surface battle ships, 27 auxiliary ships and 15 submarines (on different missions). All were held in the world different oceans and operational arenas. Among them President named the South China Sea, the Gulf of Eden, the Strait of Malacca and Singapore, as well as the Caribbean.[11] But the first arena mentioned by Putin, as he vastly described

8 Preview YouTube video: Putin's New Plan for Russian Navy: Upgrade New Russian Frigates with Unstoppable Hypersonic Zircon

9 This dimension is anchored in a document signed by Putin: "Russia's policy foundations in the field of maritime military operations by the year 2030", for details see Zvi Mirkin at Shaul Horev and Ehud Gonen (editors), Greater Maritime Strategic Assessment 2017/18 (page 122), 2018/19 (page 114), Maritime Policy and Strategy Research Center, University of Haifa.

10 Putin as head of the minister of defense Shoygu's forum and with his office's senior executives, army and navy commanders, heads of military industries and shipyards, December 3, 2019, https://www.youtube.com/watch?v=eVywf3qinGM

11 The Russian response to the competition in the international arenas, in fighting terrorism and in the conflict over the production and transport of marine resources, encompasses a broad deployment of economic, technological, media, political-diplomatic and legal capabilities, while the military capability remains dominant in the Russian perception aimed at maintaining its sovereignty. For more see Connolly Richard (2019), NATO DEFFENCE COLLEDGE, Fundamentals of the state policy of the Russian Federation in the field of naval activities for the period until 2030. http://www.ndc.nato.int/research/research.php?icode=574

the navy's activities during 2019 was the 'near' east (means in Russian terminology the 'south sea', i.e. Black and Mediterranean seas). East med. Arena includes of course the Syrian coast. He views the Naval demonstration in Syrian coast within high abilities and performances to fight against terrorist targets. Optimal coordination was held between the Navy and its headquarters, as well as among the Coordination Directorate in Syria, air force, coastal and naval teams. Putin also emphasized the importance of the port in Tartus for the Russian naval task force as a permanent port, referring to it as: "Our on-shore naval base at the port of Tartus." This port allows Russia to keep an overall control ability all over the eastern Mediterranean now days as hence forward.[12]

The northern Strategy

Another geographical region which the Russian president mentioned is the Arctic Ocean. The northern Arctic strategy led by Putin, might impact on other arenas as well, as the Middle east, too. Mainly the amount of sailing movements through the Suez Canal, that serves Egypt's key economical and maritime assets. A possible reduction in shipping traffic volume by the canal – despite huge financial investments laid down in recent years to expand the capacity of the project. The development of a possible alternative north route navigation might impact Egypt's economy, as well as the entire scope of sea vessels traffic in the region. It may also include the Chinese activities in this channel of their 'Belt and Road Initiative'. In the northern region Russia has been launching various operations with regard to the maritime sphere there. Some on the coast, and some over the continental shelf. All these are in the light of expected global warming changes, especially in the Arctic. The melt of the ice dome over the North Pole would probably allow to open shipping routes, as well as easier accesses to natural resources. Putin is aware to the importance of such developments for Russia's interests in that region, which already raised a global competition due to others significant interests there. Thus, Putin aims to possess Russia as a key ruler in the northern region, an initiator as leader for these developments, to realize maximum economic benefits. Russia's aim to set its EEZ- (Exclusive Economic Zone) within 350 marine miles from the continent, In order to fully utilize the natural resources over the continental shelf, instead of a limited distance of only 200 miles, as was assigned by the virtue of UNCLOS (1982, section 35). This issue has raised controversies with other competitors, especially the US (around Alaska's waterways), that required to formulate its policy there.[13] Russia has been establishing stages of action in order to gain its

12 Ibid

13 Rodman, I. I. (2019). ICEBERG DEAD AHEAD! DECONSTRUCTING THE PENTAGON'S ARCTIC STRATEGIE. IN https://flipboard.com/topic/arctic/iceberg-dead-ahead-deconstructing-the-pentagon%E2%80%99s-arctic-strategies---war-on-the/a-eqSk_fW8Q2KQqay4LlLBMQ%3Aa%3A27092465-7fc1e65f44%2Fwarontherocks.com

access to the strategic resources of the Arctic region. Beginning with a study of the region's geophysical infrastructures, then formulating the borders and legal aspects and definitions. Now times key implementations concern the security and protection measures, as well as the establishments of command, control and communication measures under the Fifth District of the Russian military (founded in 2014).

Two major events which occurred in December 2019 well represent Russia's interests in the region:

1. The activation of the "Akademik Lomonosov" nuclear energy rig. As the first of its kind world widely generator for electricity (Figure 3), had been towed at sea along three months over its station near the city of Pevek in the east Arctic region. Russia is occupied with further build of additional floating reactor units, some of which will be stationed also in the Arctic region.

Figure 3: "Akademik Lomonosov" nuclear energy rig

2. Additionally, on December 3, 2019, the Russian ice-breakers fleet marked the historical 60th anniversary of the incorporation of nuclear-powered ice-breakers. Three new-generation nuclear-powered "Arktika" model ice breakers (Project 22220) are in the final stages of their building, and two more are still being built.[14] The sixtieth year sheds a light on the importance the Russians attach to the opening of the Northern Sea route to merchant ships traffic throughout the year (figure 4).

14 Russian Icebreaker Fleet Celebrates 60th Anniversary, Storied History of Arctic Exploration, Vesti News, 15 December 2019. https://www.youtube.com/watch?v=0G6V5UMcn-I

Using ice breakers will allow Russia to exhaust local natural resource – meaning to break through passages in the ice, at a time when it has not yet been melted by the warming climate. This is an intermediate stage for the commercial initiative that will allow sailing in the northern route throughout the year.

Figure 4: Russian icebreaker ‘Arktika’ LK-60Ya at the final stages of its construction at the "Baltic" shipyards in St. Petersburg. Expected to be delivered in May 2020[15]

Russian formulated legislations subject to the region's developmental processes, towards the target of some 80 million tons of maritime transportation through the northern route by the year of 2025. President Putin chaired the International Arctic Forum, initiated by Russia and held in St. Petersburg in April 2019. The President addressed that the northern project has the potential for an extensive international cooperation.[16] His intentions were most likely sent for the promotion of the project above all together with China – whose president Xi attended the forum. The shipping potential by using this route could reduce about one third of the inputs compared with to the current sail between Asia and the Atlantic Ocean, using the shipping route through Suez Canal and the Mediterranean. Thus, a realization of the northern passage is expected to have implications for our region, as estimated reduction of the volume of traffic in the Egyptian Suez Canal.

15 ibid.

16 Law for "Russia's Socio-Economic Development in the Arctic region" was enacted in Kremlin about six years ago (Feb 2014) and referred to the period up to the year 2020. An update to this law was extended in Aug 2017 and was attributed to up until the year 2025. see: the approval of the state program of the Russian Federation "Socio-economic development of the Arctic zone of the Russian Federation for the period until 2020", Presidential Library, April 21, 2014, https://www.prlib.ru/en/node/468341 and also regarding resolution number 366 (and its update from august 31): http://static.government.ru/media/files/GGu3GTtv8bvV8gZxSEAS1R7XmzloK6a

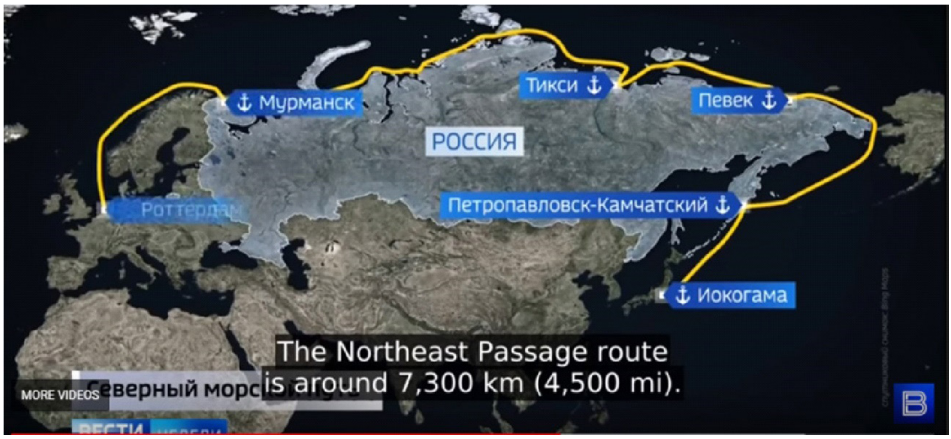

Figure 5: The 4,500 nautical miles long voyage from Japan's Yokohama port to Rotterdam in the Netherlands. From President Putin's speech at the International Arctic Forum held in St. Petersburg on April 9-10, 2019[17]

The Near East: Syria – Continued Consolidation

The scope of Russian infrastructures at Tartus Port has continued to expand within the last year and is expected to continue over (at least) for the next four years. These developments as Russians declared, would allocate the scope of about half a milliard dollars of investments in the port's infrastructures according to Russian Deputy Prime Minister Yuri Borisov (December 17 2019).[18] Borisov, emphasized that plans should renew the port by advancing its marine and vessels capabilities, as well as integrate a coastal rail transport corridor into the port. The land corridor shall connect the port of Tartus, Iraq and the entire Persian Gulf. It should be mentioned that Iranians too influence the Syrian regime to achieve their objectives being involved in the Syrian Port of Latakia operation, and mainly to open a land transport corridor by using this port as an approach to the entire Mediterranean region. An Iranian railroad route is also expected, through passing the city of Basra in Iraq (under Iranian influence). This issue joins some other conflicts between Russia and Iran concerning the establish of control in Syria and the development measures especially economical ones, after the Syria's

17 How climate change benefits Russia, CaspianReport, https://www.youtube.com/watch?v=SQY7VOQF8sY&t=40s

18 Russia in a race against Iran to take over economic projects in Syria, Meir Bar, December 18, 2019, https://nziv.net/38239

rehabilitation.[19] A certain sense of mutual use of the rail infrastructure facilities along the way over the Persian Gulf is assumed.

Russian navy's activity in Syria continued constantly this year, and symbolically displayed at the demonstration of honor on the Russian Naval Day, on July 28, 2019, held officially for the third time in Syria. Few training sessions took place along the passing year as well on the Syrian coast region, three of them towards the end of the year. The trainings were led by Russian maritime and air forces and partly involved Syrian naval forces as well. A major training held in the Tartus region on December 16-19, 2019, and included contra terror scenarios, including aerial measures versus drones, that were sent to attacks Russian bases in Syria as Khmeimim. This training was defined as the first joint one for both navies. A prior training in the Syrian coastline was conducted on November 4, 2019 under Russian coordination and, at least at the initial phase, defensive aspects were emphasized.[20]

The major Russian airport on the Syrian center coast – Khmeimim Air Base, contains apparently air-sea combat measures as platforms deployed there throughout the year. Secondary to it, Russian air force is deploying since November 2019 in another airport in Syria's north-east zone in Qamishli. A main reason is to counter Turkey, that is striving to change the demographic balance in the Kurdish enclave, and in light of US forces withdrawal from the region, in light of President Trump's policy.[21]

Russia – Turkey relations

Turkey under President Erdoğan continues to destabilize its depth relations with the West, including the extent partnership in NATO forces. On the other hand, Turks continue to strengthen their relationships with Russia, even increasing them by depending on the need to coordinate operationally in Syria. In order to define a buffer zone against the Kurds. The recent need to integrate Russian's S-400 aerial defense system which was supplied to Turkey in the last year. On the civilian field – Turkey continued its reliance on Russian gas, transporting it by pipelines over Turkey and through its soil. In spite the dual collaborations between the two states, disagreements

19 The issue arose during president Assad's visit to Tehran (early 2019), when it was decided to form a Syrian team led by the port of Latakia's director Amjad Suleiman, in order to negotiate with Iran on the operation of the port or the cargo terminals management. According to reports published regarding this matter in Al-Arab newspaper and "The Syria Report" ,see February 6, 2019 https://www.enabbaladi.net/archives/280668

20 https://www.youtube.com/watch?v=TycVHfP0iRE 20 and news agency TASS https://tass.com/defense/1100893: from December 19, 2019, from Mediterranean Sea: Russian Navy and Air Force perform joint drills Copied from page https://ruptly.tv/en/videos/20191104-027

21 See www.aljazeera.net/news/politics/2019/11/14 from November 2019

between them have been revealed as well, such as in Syria, regarding the continental buffer in the Kurdish enclave; In Libya, regarding Russian support of General Haftar's forces, who also operate from the port cities of Tobruk and Benghazi against the Libyan Consent Government – deeply supported by Turkey. Russian aid patterns include the use of private forces (Russian strategy known also from the confrontation in Crimea peninsula, see below). The Islamist consent Government receives massive assistance from Turkey (as mentioned), has rewarded Erdoğan with the signature (November 27, 2019) on a maritime agreement that establishes the Mediterranean border between the two countries and delimits their activities within it. Some other security agreements between them were agreed upon as well, The Libyan navy commander Farag el-Mahdawi, who is subordinate to General Haftar, stated that he was instructed to sink any Turkish vessel that would approach the Libyan coasts, in case of being affiliated to the above agreement. He even declared a siege on Misurata Port (with a Greek coordination) to prevent any Turkish military supplies to Libya by sea.[22] In addition, the Turks are challenging Russia regarding the Exclusive economic zone (EEZ) delimitation which they claim in the north of Cyprus island maritime territory, That contradicts with those maritime territories of Greece and Cyprus, and even as violation against the rights of other countries, as Egypt, Israel, and other participants in the regional East Mediterranean, especially those who participate in the Gas and Energy Forum. This forum also examines the transfer of natural gas to Europe through Italy in an underwater pipeline. But these pipes shall pass in territories which Erdoğan from Ankara and Fayez al-Sarraj from the Tripoli government took without consideration of any other party.

Coordination with Israel

The mutual coordination continued during the past year, intending to prevent any accidental and harm to any of the two sides during any regional operation. The last event occurred about a year and a half ago with the fall of the Russian 'il-20' aircraft west to the Syrian coast. The mutual coordination is also supposed to become a restraining effect on Russia towards Iran. Even though Iran constantly strive to deepen its hold on the Syrian region and to intensify its activity against Israel. Same from the Lebanese territory through Hezbollah and/or of Gaza Strip, mainly through the Islamic Jihad.

22 In: https://almarsad.co/en/2019/12/11/al-mahdawi-we-have-orders-to-sink-any-hostile-turkish-naval-vessel-entering-libyan-territorial-waters December 11, 2019, https://almarsad.co/en/2019/12/14/lna-warns-civilian-ships-and-cargo-aircraft-against-transporting-military-equipment, December 14, 2019.

Russia's and China's navies

Chinese Experts analysis indicates that throughout 2019, China has positioned itself as a major naval force with even a greater naval power in compression with the Russia's one[23] Mainly due to the large scope of investments which led the Chinese Navy to be equipped with a large number of platforms and marine infrastructures. Even though the Chinese Naval forces still need to gain further practices as force building processes. Thus far, Russian Navy has supported the Chinees maritime force building, also by sharing a few maneuvers for both navies. Lately such maneuvers took place in South Africa and in Iran (see below). Iran was mentioned together with Syria and North Korea, as one of their inter-state dialogues and a common subject matter topic. The two nations develop their joint cooperation, even towards a possible strategic partnership. Russia however most likely watches carefully the Chinese military buildup, from the Naval part too, continues this mutual approach as part of a broader and more inclusive political, security-defense and trade relations. Among the pertained elements of the joint strategy a substantive one refers to counter the West coalition as if in the Persian Gulf, forming common interests in the Arctic and in the northern route, as others. A possible deeper alliance between the parties was mentioned too.[24]

The joint trainings of the Chinese and Russian navies symbolize the important aspects and areas of mutual interests, in where they share the growing cooperation between them. In some cases, third sides were involved too, mainly the host fleets as for the South African one (November 2019), or the Iranian fleet and Naval forces (in late December 2019). The last mentioned joint maneuver with Iran was refereed to by Foreign Minister Lavrov,[25] who noted that it displays Russia's efforts to establish security mechanisms in the Persian Gulf, as jointly planned and shared together with the Chinese and Iranian states' navies. The trainings contained officially some counter terror and piracy activities over that region of the Indian Ocean. The Iranian Navy Commander – Admiral Hossein Khanzadi has announced on his part that the trainings held in late December 2019 deliver a message to the world, herald the deep cooperation between the three countries, who currently share a significant strategic point in their

23 China 'has overtaken Russia' as a maritime power, boosted by joint naval drills, Kristin Huang, 16 June 2019, https://www.scmp.com/news/china/military/article/3014659/china-has-overtaken-russia-maritime-power-boosted-joint-naval

24 Is China and Russia's 'marriage of convenience' Donald Trump's worst strategic blunder?, Shi Jiangtao, 8 June 2019, https://www.scmp.com/news/china/diplomacy/article/3013614/china-and-russias-marriage-convenience-donald-trumps-worst

25 See footnote 3.

relations (Figure 6, by the Iranian news agency INDUS).[26] During the maneuver itself, the Iranian Coordinating Force Commander (December 29, 2019) stated that it is his country's intention to conduct further joint naval trainings with the participation of the three navies in the future.[27]

Figure 6: The joint maneuvers for China, Russia and Iran[28]

Another joint training for the Russian and Chinees navies held (in end of November – early December 2019) in Cape Town South Africa, for the first time in this area (Figure 7). The event was a co-operation with the South African host navy. It displays the shared power of the two Asian powers in this region as well and highlighting the significance both of them pay over the importance of the African continent. In where both invest promote and establish development and investments, using the maritime middleware between Africa and Asia.[29] These activities were most likely coordinated between Russia and China also in a summit held between them regarding the Middle East and Africa issues in Moscow on October 11, 2019.[30]

26 The joint naval military exercises of China Iran and Russia are "a message to the world", Abraham Tamaker, November 29, 2019.

27 The Russian news agency TASS, Iran plans to hold more joint military drills with Russia, China, 29 December 2019, https://tass.com/defense/1104591

28 Ibid.

29 China, Russia: Countries Deploy Naval Assets for Joint Exercise off South African Coast, 27 November 2019. https://worldview.stratfor.com/situation-report/china-russia-countriesdeploy-naval-assets-joint-exercise-south- african-coast

30 From TASS – in continuation to a joint conference on October 11, 2019 in Moscow, WORLD11 OCT, Russian-Chinese consultations on situation in Middle East held in Moscow. 18:37 https://tass.com/world/1082760.

A certain dimension of cooperation between the two powers are also evident in the Russian Arctic strategy, as China is seen as to have interests and also beneficiaries out of that initiative. Maybe even the major beneficiary, as well as a probable key partner (an investor?) – in the developments on the northern shipping route, and infrastructures involved in the Arctic region's developments. It should be mentioned in this context that both presidents Putin and Xi have attended in two forums: one led by Russia- regarding the Arctic issue in St. Petersburg, and the other led by China as a part of the 'Belt-and-Road Initiative' (BRI) in Beijing, where the Realization of the Northern Maritime route for Chinese use was discussed as well.

Figure 7: Cape Town, South Africa – Visiting missile cruisers from Russia and China during which a triple training with the South African Navy was conducted[31]

Saudi Arabia, Russia, China

After the attacks on Saudi oil refineries on September 14, 2019, attributed to Iran, President Putin arrived for the first time since a decade to visit Riyadh, for a meeting with Prince al Salman. This visit was might have been arranged already before the above mentioned attacks ; however the attack results were probably a catalysator to accelerate contacts between the two countries, regarding the subjects of security

31 Chinese News Agency Xinhua, November 26, 2019.

as well as Saudi procurement from Russia, including S-400 air defense systems. The various scopes of trade were focused on the development of the energy sector, especially some coordination on the production of various oil products and its pricing. The different projects and procurement that were published referred by estimations for about two billion dollars. A key valuable benefit for Russia can refer to the relations with the host, who represents the Sunni Islamic world, as at the same time Russian enjoys the relationships to the Shi'ite world thanks to it tied relations with Iran.[32] Russia may therefore play a mediating role between the parties; including leading a coordination between Saudi Arabia and their other neighbors, e.g. the Houthis in Yemen,[33] and even some other countries in the Arabian Gulf.

It can be added that Saudi Arabia operated a first naval maneuver in cooperation with the Chinese navy, whose ships visited Jeddah port in the Red Sea in late November 2019.[34] The maneuver was aimed against terrorism and piracy. Even though is was the Chinese and not the Russian navy, the proximity and overlap of these training arrangements with those of which the two fleets operated among themselves as also other parties earlier, i.e. the Iranian and South African naval forces in December 2019,[35] may indicate for a Russian involvement, albeit a passive one, in the training in Jeddah, too. That is given the strengthening of Russia-China relations and their mutual interests In the Middle East arena.

The Persian Gulf[36]

The escalation in the Persian Gulf, which has intensified since spring 2019 between Iran and the United States leading coalition states as some Persian Gulf countries, evoked Iranian apply to Russia for sorts of assistance. Russia's willingness to comply and to cooperate with Iran in the Persian Gulf- allowed her in return to establish its position in that region and probably also in the international arena. The impact for the Iranian naval forces would emphasize mainly on the chokepoints i.e. Strait of Hormuz and Bab El-Mandeb (by the Houties in Yemen). An expression to the cooperation between the parties was demonstrated as the Iranian navy commander Admiral Hussein Hanzadi

32 https://www.middleeastmonitor.com/20191014-saudi-visit-showcases-putins-growing-middle-east-influence from October 14, 2019

33 Foreign Minister Lavrov on the need for diplomatic settlement of the Yemeni conflict TASS, October 2, 2019, https://tass.com/politics/1080990

34 https://www.middleeastmonitor.com/20191118-saudi-arabia-china-launch-joint-naval-exercise-in-red-sea from November 18, 2019

35 See footnotes 27, 29.

36 The emphasis in this chapter will focus on Iran, though Russia has maintained contacts and coordination with other states in the Gulf, including Qatar, the United Arab Emirates and more.

visited Moscow and St. Petersburg – the Russian navy's home port at the end of July 2019, and brought the parties to agree upon the joint maneuver as was executed in the Northern Indian Ocean by the end of 2019. Thus, frigate Mudri (Figure 8) realized its arrival at Iranian Chahbahar Port in Oman Bay on December 27, 2019. This port is located close to the Straits of Hormuz but towards the ocean, out of the Persian Gulf (Figure 9).[37] The docks in this port are operated by an Indian company (India Ports Global Private Limited – IPGPL). It can be noted that India hosted the Russian frigate pre to its arrival in Iran, for a joint naval training with the Indian Navy.[38]

Figure 8: The frigate Yaroslav Mudry, in a joint visit and maneuver with China's and Iran's fleets, December 27-30, 2019

Figure 9: Iranian Chahbahar port in the Gulf of Oman near the straits of Hormuz

Russia's willingness to operate in the Persian Gulf, either based on its own initiative or as a response to an Iranian invitation, will strengthen its status as a global power, and carry weight on that other regional Middle Eastern focal point. This arena joins to Russians already marked presence in the east Mediterranean since it began operate in Syria in 2015. This move let Russia two years later (2017) to establish its permanent outpost at the Tartus maritime port and the airport of 'Khmeimim'. Another Russian activity center is identified in Libya, allowing a huger grasp on the North African spatial in the Middle East.

The Iranian Foreign Minister Mohammad Javad Zarif who also visited Moscow (September 2, 2019) referred in advance to the joint naval maneuvers and highlighted

37 The Russian Ministry of Defense website, The Baltic Fleet detachment of warships made a call to the Iranian port of Chabahar, December 27, 2019. https://eng.mil.ru/en/news_page/country/more.htm?id=12268635@egNews

38 The Russian news agency (TASS), Russian Baltic Fleet warships set off for Iran after joint drills with Indian Navy, 20 December 2019, https://tass.com/defense/1101663

its contribution to the security in the region and the cooperation as synergy between Iran, Russia and possibly other neighboring countries too.[39] Putin too (in September 5, 2019)[40] related to the Russian readiness to advance its maritime operations in the gulf region, together with Iran, or even as a part of multinational efforts of neighboring states as other stakeholders, especially the key powers including China, India, and possibly the US.

It is worth to mention that these powers competing with each other for a control on the main trade routes in the region, using also footholds in foreign ports, located within proximity to these routes.[41] The Chinese navy actually integrated into the maneuver, as with a question mark whether the Indian Navy, with which Russian navy drilled just a week earlier, was at least aware of its existence.

Yemen

South Yemen locates by the chokepoint of Bab El-Mandeb Straits on the way to the Red Sea, Suez Canal, and the oceanic crossroads which connects Asia, Africa and Europe. The location was seized by the Houthi rebels who established and held from this coastal arena a marine front, to influence and express pressure on the vast maritime traffic of the Global trade in that region. Also using of ‘asymmetrical’ warfare as 'sub state’ characteristics. Iran serves as a supporter that provides the Houthis with weapons. Russians, due to their awareness to the threat, have tried throughout the year to settle the domestic conflict in Yemen between the Houthis and the country's governing entities.

Settlement of the marine event that occurred about a year ago in Crimea

This issue is raised as an aftermath to an event that was reported in the HMS annual maritime assessment for 2018-2019. Incident held in the Kerch Strait where Russia by using naval police forces seized three Ukrainian navy vessels on Nov. 25th 2018. The event continues Russian annexation (in practice) of the Crimea Peninsula since 2014. The three Ukrainian vessels were arrested as they sailed in the Kerch strait, northbound over the Sea of Azov, due to Russian claim of penetration into the Russian territorial waters. Vessels and crews were detained and prisoned in Russia. After a

39 The Russian news agency (TASS), Iran and Russia to hold joint military drills in Indian Ocean, September 2, 2019, https://tass.com/defense/1076082

40 The Russian news agency (TASS), Putin says special organization may be created to address problems in Strait of Hormuz, 5 September 2019, https://tass.com/politics/1076711

41 Guzanski and Horowitz, "The ports race in the Arabian sea: International and regional competition for control of trade routes", INSS, August 5, 2019.

year the crews were released and brought back to Kyiv, and the vessels were returned to the Ukraine (on November 18, 2019). These developments mean a step towards the soften of the relations between the two countries, as was also planned during the "Normandy" summit aiming a reconciliation between Russia and Ukraine, including the issue of Crimea Peninsula. This summit took place in Paris on December 8, 2019 and was mediated by France and Germany.[42]

Russia expanding its activity in Africa

Russia's key interest in the continent of Africa revolves economic as political interests. The utilization of the continental's Natural resources created the involvement by investing and developing of infrastructures in the various countries of the continent.[43] Foreign Minister Lavrov held (in early 2018) a tour in the Central continent countries (Angola, Mozambique, Zimbabwe and Ethiopia). The Maritime aspect concerns the relationships with the rim coastal countries such as Sudan in the Red Sea, South Africa, or in North Africa in the Mediterranean Egypt, Algeria and Libya. Other expression of the development process as headed by Russia with the continental states of Africa includes Russia's Initiative of the Russia-Africa Forum, (was first held in October 2019 in Sochi). One among the elements that Russia uses also in Africa in keeping of its interests, includes the private mercenary groups, as an effective tool serving of the Kremlin.[44]

One of the forum's sessions was chaired by Putin and assigned for Russian exports of civilian nuclear energy reactors by 'Rosatom Corporation' to African countries. It has been reported that guests have shown interest in such a proposal, as some have already signed memos for its promotion in their countries.[45] The maritime context concerning such a possible move, lays in the light of the first floating reactor for Russia's own use. The project was activated operatively in December 2019 (see the paragraph about the Northern Strategy). A success of the reactor's integration process in the Northern Sea may subsequently serve as a catalysator that would affect the marketing

42 Russia returns seized Ukrainian naval ships, DW News, November 18, 2019, https://www.youtube.com/watch?v=NXnyp_LE_AI

43 Arms and sovereignty are priorities for Russia's return to Africa, Middle east monitor, October 31, 2019, https://www.middleeastmonitor.com/20191031-arms-and-sovereignty-are-priorities-for-russias-return-to-africa

44 The involvement of Russian private military companies in Africa is rapidly growing, and with it, their political and economic influence, Sergey Sukhankin, ECFR, November 12, 2018. https://www.ecfr.eu/article/commentary_russias_hired_guns_in_africa

45 Russian news agency TASS, All African leaders at meetings with Putin touched upon cooperation in nuclear power, October 23, 2019, https://tass.com/world/1084807

of such floating reactors, whether to Africa or in other regions. Sudan has already been mentioned in this context (see below). The maritime sphere has long been promoted by security as diplomatic articles between Russia and African countries, also by the light of visits and even trainings of Russia naval vessels that have taken place there throughout the year.

States along North Africa's coasts

Libya

The Russian involvement expanding its military and economic influence in the North African continent of the Mediterranean coasts is significantly evident in Libya. Russia is mainly aiding the Libyan National Army (LNA) under the command of General Haftar. This Russian military aid also incorporates a model of operating mercenaries as private 'Wagner Group',[46] an integration also recognized in other Russian fronts like Ukraine and Syria. The Libyan leader Haftar visited a year ago (November 2018) in Russia where he met with Russian Defense Minister Shuygo and Evgeny Prigozhin, head of the 'Wagner Group'. Haftar recently threatened to damage Turkish sea vessels, after becoming established in the cities of the eastern Libya and their ports, in where he might have captured some 'leftovers' of the former Libyan Navy capabilities. In addition, he also received sponsorship from Russian "hands" as mentioned above, though no concrete evidences for such involvement in the maritime sphere on these manners. However, in general the involvement method of support may potentially include also 'Limited Confrontation' dimensions. Term which refers to the operations of 'small forces', not necessarily military as well as 'fields of information and communication'. These entire purpose means to create instability over the "other side". Russian Chief of Staff Valery Gerasimov's 2020 doctrine sees them as 'effective measures to protect Russian interests'.

The Libyan battle arena would probably affect also the maritime sphere too, as fights occur mainly on the coastline where main Libyan infrastructures are settled as well as maritime assets like ports are located there and so for key land transport routs. Economically, the eastern ports, Tobruk located at the Egyptian border and Benghazi located near the Gulf of Sidra, as rest of the Libyan coast and Tripoli in the west – are also a potential for natural resources, especially oil resources and its transportation. The country's long coast is relatively proximate to Europe requires a special cope with the contexts of refugees and immigration from the continent of Africa. This context

46 Russian Snipers, Missiles and Warplanes Try to Tilt Libyan War, David D. Kirkpatrick, New York Times, 5 November 2019, https://www.nytimes.com/2019/11/05/world/middleeast/russia-libya-mercenaries.html

shades which Putin has mentioned, about the possible absorption of terrorists from Syria, or other ISIS members escaping to Libya through its coast. Arrival to Libya as final destination or a temporary one could serve them after words to move further on over Europe. There is fear from Turkey who may aid the development of such a possession. Putin himself mentioned Libya as a destination for terrorists, thus requires action in order to thwart it and its consequences.

In conclusion the consequences of Russian involvement in Libya would impact on Libya's internal future. The regional location may also affect the immigration from Africa mainly to Europe that would be affected also by a possible control on the fossil energy sources and its transportation. The Turkish involvement impacts the already tensed relationship between Libya and Egypt as other players in the complexed Mediterranean arena. Russia could use an advantage being a potential mediator between the parties. A similar status it positioned in in other arenas as in Syria and the Persian Gulf.

Algeria

Russia's increased involvement in Maghreb was evident first and foremost in Algeria, which is a key partner out of seven other African countries who trade with Russia.[47] Putin met with Algerian leader who latter attended the Russia-Africa Summit in Sochi (October, 2019). Purchase agreements have been discussed, including debt cancellation still since the Soviet period. Meeting were a proceed to a former one from April on foreign ministers' level.[48] Russian naval ships had visited Algerian's ports this year for joint training with the local navy. Russia is a leading weapon supplier in Algeria, including its maritime sphere. As Algeria has tended maritime cooperation with Russia since Soviet period. Today Russia increases its foothold in Africa and in the Mediterranean, in contrary to the American departure of the region, the continent's economic potential for development, strengthen also Russian interests to deepen its cooperation with Algeria.

On August 29-26, 2019, the 'Marshall Ustinov' Missile Patrol 'Slava' class from the northern fleet visited Algiers. This port was the first foreign port in the Mediterranean that the forces visited, as part of its long journey which also included a visit in South Africa. On November 28, 2019 'Admiral Makarov' missile frigate from the Fifth Black

47 Russian news agency TASS, December 4, 2019, press review: Moscow, Kiev renew oil transit and Africa's opportunities bring back Russia, https://tass.com/pressreview/1095393

48 Russian news agency TASS, October 24, 2019, Putin, acting Algerian president discuss military and technical cooperation, https://tass.com/defense/1085166

Sea cruiser had a naval maneuver with the Algerian navy.[49] This vessel completed a 90-day tour in the Mediterranean, and passed (December 23, 2019) in the Turkish Straits on its sail back to the Black Sea.

Egypt

Egypt is also one of the seven African countries who lead the trade with Russia.[50] The president Abdel Fattah el-Sisi works to diversify the variety sources of weapons supply to the Egyptian army. Russia is a significant source in this regard. The Egyptian president attended the Russia-Africa Forum, furthermore, used the occasion to hold a separated Russian-Egyptian economic summit (October 24, 2019). The Russian minister of defense arrived at Cairo for discussions about two weeks later. These events exposed to president a-Sisi's intentions to appoint his son as the Egyptian military attache' in Moscow.

In the maritime areas as was mentioned, the sale of Bastion-P coastal missile K300-P for launching of Yakhont missiles. Egyptian interest regarded equipping from Russia of aircraft 'Sukhoi 35' was mentioned but caused an American resistance.[51] In the field of civil procurement, Russia offered Egypt to upgrade the shipyards in Suez or even to build a new instead the existing one.[52] Also mentioned (May 2018) indications about the establishment of an industrial complex zone east to Port Said next to the canal. It has been considered as an axis for a future development mutual relation among all other economical projects. Additionally, it was agreed to establish four energy reactors that will be installed in El Dabaa in the west Egyptian Mediterranean coast, west to Alexandria, the location id next to a water desalination facility located there.

The Russian navy's visits to the levant region and in Egypt were made either to show the flag but also for the need to use the passage mainly of Suez Canal as a needed passage. Visits to be emphasized are the one of the 'Ustinov' cruiser which visited Egypt while touring the Mediterranean.[53] Ships from the Black Sea Fifth Cruiser have also conducted visits and even trainings in Egypt during the year[54]

49 Russian news agency TASS, November 28, 2019, Russian missile cruiser wraps up call at Algerian port in long-distance deployment, https://tass.com/defense/1075604

50 See footnote 47.

51 TASS, https://tass.com/politics/1091581 , from November 21, 2019.

52 TASS, https://tass.com/economy/1088181 , from November 12, 2019.

53 See footnote 4.

54 TASS, https://tass.com/defense/1093201 , November 27, 2019.

Sudan

Russia and Sudan have signed an agreement allowing the stay and the use of ports in Sudan by the Russian navy. The validity of the agreement, was signed on May 9th, 2019, should be remained even though the former president Omar al-Bashir's government has changed as a part of a revolution held in the country on April 11th, 2019. The agreement's validation is for seven years; however, it will be conditioned due to Sudanese rules to the Russians presence. In the maritime field, the agreement will cover an appendix refers to a joint marine save and rescue activities[55] Russians important achievement should allow them to receive a permanent foothold base in the Red Sea. Sudan's procurement is based historically on USSR products, and of today's Russia as well also expect to increase it over an extent of about 60 percent. The issue of supplying a possible floating energy reactor from Russia to Sudan came up as well.

Summary

Over the past year 2019, Russia appears to have significantly strengthened its hold over the marine spheres in the Mediterranean region. Its interface with China has deepened and tightened and may even lead to a hence forward alliance between these two powers. Among the factors driven over status is the US. Attitude to leave the Mediterranean region. In contrary, Russia takes the advantage to expand its coastal footholds in various front bases. Russia is permanent present in Tartus port, while its arms are directed towards other spots as in Libya, Sudan and possibly the Persian Gulf. Other approach which was demonstrated during the year were the flotillas abroad over the Mediterranean Region, demonstrating diplomacy at sea, showing the flag. Other manners included also port visits and even marine maneuvers with other parties.

Regionally, the maritime crisis in Crimea that raised up in late 2018 evoked a dispute with Ukraine was decreased towards the end of the current year. Partly it was achieved thanks to the efforts of the 'Normandy' Summit mediated by France and Germany. By this mean, Russia would be able to direct its sources to other areas of interest, emphasized the those in the Syrian coast, i.e. Tartus Port and Khmeimim airport. These interests cover also civilian infrastructures for investments as developments of ports, docks, railroads connecting the ports, nautical linkers and alike.

Putin himself referred to the advantages that Russia receives, given the possible control over the Mediterranean – based on Syria. That foothold allows Russia to foster other spots of interests, as in Libya. Which would allow to monitor movements of Islamist activists from Syria to Libya for example, despite assistance they get for it from Turkey.

55 TASS, https://tass.com/defense/1059881 , May 24, 2019.

Russia's influence in North Africa has a significance due to its proximity to Europe and the attempt to prevent migration especially of terrorists over Europe. Similar needs refer also to the production and transport of energy resources and its products. Other African coasts states strengthen their relations with Russia like Sudan and South Africa. It’s possible that these Russian moves were partially coordinated with China as well.

Russia's partnership with China and the Persian Gulf, perhaps as part of a counter-coalition to the President Trump initiative was well demonstrated during the joint maneuver with China and Iran. Such a maneuver could bring to similar ones hence forward with more and other participants.

The Iranian invitation for the Russians to act in the Iranian coast, reminds of a former invitation for their presence on the Syrian coast, that appeared a few years earlier on 2015, by President Assad. The Iranians acknowledge themselves for the initiative which invited Russia over Syria. Such a move could serve as a possible model of action adopted by the Russians again either in the Persian Gulf or even else like in Libya, next to General Haftar.

Various Front coastal posts in other arenas, including Yemen, Sudan and other countries in Africa followed all, the Syrian model.

Deepening the interfaces with China might scope other dimensions of partnership between the two such as in the Arctic region, or even in Africa.

In parallel to Russian's geographical deployment, president Putin prioritized the Russian naval needs for new procurement on the front.

Russia's rising position combines a naval power which plays an increasing role in the global diplomacy,

especially in those whose order is unstable

Strengthening the Navy for Putin means not only a political tool, but also a tool for developing the economy like in the northern region. The beneficiaries are the technology and military industry but also of civilian shipping.

Recommendations

In view of Russia's prominent strengthening in the maritime sphere, it is recommended that Israel continues to adhere and even deepen the coordination with Russia.

Russia preforms a status which could allow its involvement among many if not all sides involved.

Maritime sphere is subjected to global changes as worming.

Developing maritime dialogue subjects with Russia should be done simultaneously on several levels, including the academic- research level, with mapping out potential opportunities for advancement and development of diverse projects and topics in the field.

Russia's 'Arctic Strategy' As a Result of The Inter-Systemic Power Struggles

Zvi Mirkin

The emergence of Russian naval forces in the Arctic region

The Russian establishment in the Northern Ocean basin has a very long history. Arkhangelsk port was established close to Northern Dvina River's estuary in the end of the 16th century and served as Russia's only exit to the sea using the sea route leading to northern Europe. The conquest of the Baltic seashores on its ports Tallinn and Riga, and the Establishment of Saint Petersburg at Neiva River's estuary during the Great Northern War (1700-1721) enabled Russia additional exit routes to the sea, and caused a significant decline of the importance of the northern region in general and of Arkhangelsk in particular, and as a result a decline in the efforts aimed at developing this region. In the year 1913 passed through Arkhangelsk that remained Russia's only northern port only 4.3% of the country's maritime traffic.[1]

The situation changed with the outbreak of the First World War. Russia was in need of a safe route with its allies- France and Britain, when its western border- both maritime and continental- became the war zone. In this situation, the only practical option was establishing a sea route through Barents Sea. For its implementation, in March 1915 was established on Kola Bay's Coast of Barents Sea the city Murmansk, which became Russia's northern maritime gate. At that same time began the construction of a railroad leading to the city Murmansk and of a military port. During that year a number of battleships and auxiliary ships were stationed in Kola Bay, and in early 1916 a decision was made to set up an independent flotilla that will be responsible for the Northern Ocean arena.[2]

The construction of the naval force in the north continued up until the Bolshevik Revolution. The new regime that came into power in late 1917 did not dealt with this matter for the first 15 years of its existence, and most of the military activity in the arena amounted to a number of training cruises of the Baltic Sea navy ships that were staffed in teams composed of naval officers' schools cadets.

1 The northern Fleet of Russia, России флот ed Северный .О ,Ерофеев Murmansk, (1996), p. 37.

2 The northern Fleet of Russia, России флот ed Северный .О ,Ерофеев Murmansk, (1996), p. 42.

Figure 1: Russia's Northwest region

The situation changed in the early 30's of the 20th century, when the soviet government intensified its deliberate efforts to develop the Arctic region.[3] As part of these efforts the canal connecting the Baltic Sea and the White Sea was constructed. And this enabled, among other things, ships transportation from the Baltic Sea to the Northern Ocean without encircling the Scandinavian peninsula. During 1933 a number of destroyers and submarines from the Baltic sea passed in this route to the north, and on June 1st of that same year the command for the assembly of "The Northern Military flotilla" was signed, which became the "Northern fleet" in 1937.

During the Second World War the Northern fleet was, in fact, the Soviet Union's only active fleet after the Baltic fleet and the Black Sea fleet were neutralized by the Germans. However, its role was secondary – it provided support to the northern front who operated 'trench warfare' against the Germans in Kola Peninsula and was responsible for securing the "Arctic convoys" in the final section of their path.

3 On the development of the Far North see in detail: Mirkin, "The Russian Northern Maritime Route" – Statements and Realities", in: *Greater Marine Strategic Assessment for Israel*, 2018/19, Shaul Horev and Ehud Gonen editors (Haifa, 2019).

Figure 2: The White Sea Canal route, opened in 1933

Turning the Northern fleet into a "strategic fleet"

The changes in the northern fleet's status and role began in the mid 50's of the 20th century, when the Soviet leadership made a strategic decision to build a "blue waters fleet" (or in Russian terminology "The Ocean Fleet").[4]

The direct result of this decision was a decline in the Baltic Sea and the Black sea fleets' status, which were formerly the leading fleets of the Soviet forces, and the rise of the Northern fleet and the Pacific Ocean fleet. Among the reasons for this were three main ones:

1. Change in the perception of threat- throughout all of the Russian navy's history it was preparing for combat against the European powers' fleets, and especially against their attempts to prevent Russia (and the Soviet Union later on) from using the maritime routes and attacking its navy bases. After the Second World War, as the cold war began, Moscow began to perceive the US navy as its main threat.

4 Ерофеев ,О .ed. Северный флот России The Northern Fleet of Russia, 4 Murmansk, (1996), p. 198.

2. The geographical circumstances – both the decision to build a "blue waters fleet" and the change in perception of threat (that are obviously connected), demanded that the Soviet Navy will have an exit to the open ocean. The two major old maritime arenas – the Black and Baltic seas – were therefore small and closed. They did not provide the fleet forces that were built enough space for maneuvering, and additionally the exit from them required passing through straits that were under the control of countries that were US allies. In fact, Russia's naval forces were locked in these two seas. Stationing the fleet in the Arctic Ocean and in the Far East at that time enabled access to the Atlantic and Pacific oceans. The Atlantic was of special importance as a territory from which the US could be attacked, as well as a main route for transferring forces from the US to Europe, which was perceived by the Soviet headquarters as the main battle zone of a possible war between Warsaw alliance and the north Atlantic alliance.
3. With the development of the strategic submarine array the importance of the arctic region in the Soviet Union's threat perception and strategy increased. The first cruises of the US nuclear submarines in the arctic region created an impression in Moscow that "the main opponent" might use this region as a stance for a surprise attack.

Those circumstances made the Northern fleet a major strategic component of the Soviet navy. It was the first of the Soviet fleets that was equipped with nuclear submarines, and afterwards the main nuclear submarine forces belonged to it as well, and from it also came most of the ships that operated within the framework of two important and powerful "operational fleets" – the seventh whose area of responsibility was the northern Atlantic Ocean, and the fifth that operated in the Mediterranean. The northern fleet was also in the first place in the entire Soviet naval arm in terms of resource allocation, and the vast majority of the officers who have held senior commanding positions in the arm were positioned at one point or another of their career for service in the northern fleet.

The Post-Soviet Period

Like the entire Soviet army, the northern fleet was affected by the collapse of the state's economy in the late 80's and early 90's. The system that has enjoyed decades of almost unlimited budgets,[5] had to function under extremely severe saving terms. The result was a reduction of forces array, removing many ships from use, and an

5 Mikhail Gurbachev described in his memoirs, published after the breakup of the Soviet Union, the situation where senior figures responsible for managing the Soviet economy not only had no effect on the scope of the security budget, but sometimes were denied access to full data on this part of the budget: Gorbachev, M. The Life and the Reforms (Moscow, 1995).

almost complete halt of extensive activity in regions far from the Russian coast. The situation has not changed even during the first attempts to revive the Russian army after Vladimir Putin's rise to power. For example, the only aircraft carrier of the Russian navy, 'Admiral Kznetsov', that entered the Northern Navy's operational array at the end of 1991, performed between the years 1991 and 2008 only two long-distanced cruises: one in 1995-1996, and the other in 2007-2008, both were presented in the media as exceptional events.[6]

The situation began to change only in 2008 with the initiation of the military reform by the new minister of defense Anatoliy Serdyukov. Although land forces and air forces were given a very high priority, the navy was also given additional resources. With that, the reform also included unexpected changes.

In 2010 the northern fleet ceased to exist as an independent command and in the framework of the regional commands'[7] reform it was added (along with the Baltic Sea fleet) to the "Western Regional Command", which was responsible for protecting the west and the northwest of the country. This situation didn't last long, and in as soon as 2014 (about two years after the dismissal of the reform initiator Anatoliy Serdyukov) the northern fleet was removed from the "Western Command" and on its base the "United Strategic Command of the North" was established. Within the latter command's area of responsibility is the whole arctic region, and to it are subjected the fleet's naval forces and air forces, "The Coastal Forces"[8] and the air defense forces that are responsible for protecting the northern sky.[9]

These changes were carried out simultaneously with the rise of the importance of the subject of "the Arctic Region Security" in Russia's political and security discourse. The discussion of "threats to national security in the Arctic" and "the need to strengthen Russia's control in the Arctic region" began as early as the 2000's, and brought about

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6 "Тяжёлый авианесущий крейсер "Адмирал Флота Советского Союза Кузнецов": Досье" (Heavy Aircraft Cruiser "Admiral Flota Sovetskogo Soyuza Kuznetsov": The file), TASS, Apr. 23, 2018. tass.ru/info/5150368

7 The reform of the regional commands was carried out in the years 2008-2010 as part of the general reform of the Russian army. Within this reform the Russian army gave up the division into fleets and regional commands which existed, more or less, since the 60's of the 19th century, and moved to a command system based on the "strategic directions" similar to the one existing in the US armed forces.

8 The Russian navy arm's "Coastal Forces" are subjected to the naval commands and include the coastal units that are intended for coastline protection (Coast-sea missiles array, coastal cannons array, mechanized infantry units and marines' units).

9 "Север Арктики: Создано новое стратегическое командование" (The North of the Arctics: New Strategic Command Has Been Created), *Rossiyskaya Gazeta*, Dec. 1, 2014. rg.ru/2014/12/01/komandovanie-site.html

the revision of Russia's "maritime doctrine" in 2015, to which were added clauses about these subjects. Additionally, in the "doctrine" a clause appeared on "the key role of the northern fleet in ensuring Russia's security from the sea".[10]

The Russian leadership declares also about strengthening the northern fleet's force array. Officially, the order of battle (ORBAT) of the northern fleet includes one aircraft carrier, three cruisers, seven destroyers, one frigate, six landing crafts and about twenty battleships and auxiliary ships, intended for "brown waters" activity. The submarine forces include eight strategic nuclear submarines, seventeen attack submarines and multi-purposed submarines, and eight submarines with diesel engines armed with torpedo. Additionally, exists an array of "coastal forces" that includes missiles forces and air forces and three infantry brigades.

The naval forces ORBAT of "the northern command" is relatively small, especially for the framework that is, at least officially, the main component of the Russian naval power. Furthermore- some of the ships, including the main ones- "Kuznetsov" aircraft carriers and two cruisers out of three – are under general renovation, the deadline of which is unclear. As for the infantry and artillery forces it's not so clear what is the threat they are supposed to face, given the fact that the threat of hostile forces landing in the Arctic has not been practically in existence since the ending of "the cold war".

It's important to note, that in addition to the operational and management aspects, the changes described above had a very important consciousness aspect. Indeed, since 1953 the independent navy bureau was nullified, the navy commander turned from being a minister to being one of the Soviet Union's deputy defense ministers, and therefore the status of the navy's main headquarters declined (that was previously equal to the general staff's status).[11] With that, the navy kept a certain independence. One of the main components of this independence is the fleets' status, which was equal to the status of the coastal regional commands, and their commanders were subjected to the force's main headquarters, and only through it to the general staff. The meaning of the fleets being a part of the regional commands was the absence of their independence (even if this independence was only mostly formal) and their subjugation to the coastal forces. With transforming the navy's headquarters from Moscow to Petersburg in 2012

10 Морская доктрина России – Крым и Арктика в приоритете (The Naval Doctrine of Russia – the Crimea and the Arctics Are the Priorities), *RIAN*, Jul. 26, 2015. ria.ru/20150726/1148852131.html

11 This was expressed even in the name change: up until 1953 the body was called "the general naval headquarters", and after the nullification of the navy bureau its named was change to "the main headquarters of the navy".

these changes caused a significant decline in the navy's status in comparison with the other components of the armed forces.[12]

Taking into consideration these circumstances, the significance of the creation of "the northern strategic command" that is based on the northern fleet headed by navy personal, was not only from an operational aspect but also from a consciousness aspect- or even more from the consciousness aspect than the operational one. The fact that part of the reasonability fields of the coastal forces (defense on the 'far north') and its units (three mechanized infantry brigades, one in Chokotka peninsula and two in Kola peninsula) and of the air force (the 45th air force and air defense's division)[13] were transferred to the navy, was to some extant a "compensation" to the navy for the humiliation of previous years.

It's possible that the subject of "the threat in the arctic" is taken advantage of by the navy's top command, which a significant part of its representatives, including the force commander Nikolay Yevmenov are the "graduates" of the northern fleet, for the inter-systemic struggle about influence and budgets. Here will be noted, that in between the years 2008 and 2016 Russia's defense expenses were on the rise: starting at 48 Billion US dollar in 2008 and up until about 82.5 Billion US dollar in 2016. Afterwards began a decline, in 2017 Russia's defense expenses were about 66.5 Billion US dollar, and in 2018 about 64.2 Billion US dollar.[14] This situation may cause an intensification of the inter-systematic competition for the budgets, and undoubtedly, the strengthening of the "naval component" in Russia's perception of threat will play into the hands of the admirals.

12 The transfer of the navy's headquarters from Moscow to Petersburg was presented, indeed, as returning the navy's command bodies to their historical location, in which the Russian navy was born and developed, but in practice its meaning was, in Russia's centralist bureaucratic system, the removal of the heads of the navy from decision making center and from the top leadership of the state and the army.

13 Полярное влияние: Северный флот получит статус военного округа (The Polar Influence: The Northern Fleet Will Get a Status of a Regional Military Command), *Izvestiya*, 2019, Apr. 19, iz.ru/869512/aleksei-ramm-aleksei-kozachenko-bogdan-stepovoi/poliarnoe-vliianie-severnyi-flot-poluchit-status-voennogo-okruga

14 *SIPRI Military Expenditure Database*, www.sipri.org/databases/milex

Iran's Maritime Policy as Expressed in the "Tankers War" of 2019

Shlomo Gueta

Introduction

Since the summer of 2019 the tension between Washington and Teheran has increased with the capture of the Iranian tanker 'Grace 1' in the Strait of Gibraltar and the imposition of sanctions on Iran and on the group of countries and organizations supported by it by Trump administration, that has caused a renewed combustibility of the tension around maritime traffic in the Strait of Hormuz, mainly in the context of oil tankers transportation from the Persian Gulf and to it. The background to the renewed tension is the rigorous sanctions that the United States imposed on Iran in order to bring it to the negotiating table regarding the nuclear deal.

In mid-2019 a year has passed since President Trump has cancelled the nuclear deal, and the one-year transition period has ended, that the Americans allocated until the transition into strict sanctions that will prevent Iranian oil exportation.

In response the rulers of Iran, in them the President Rouhani and officers of the Revolutionary Guards, threatened that their country will block the Strait of Hormuz and will prevent the passage of fuel cargos to international markets. In that context it's worthwhile to quote a statement made by the President Rouhani in the second half of the year 2018: "We have always ensured the security of this strait [referring to the Strait of Hormuz], don't you play with the lion's tail or you'll regret it forever" (free translation from Persian).[1]

The Iranian navy commander, Admiral Hossein Khanzadi, stated on his part at the beginning of May 2019 that "The Islamic republic of Iran, in response to sanctions on oil exportation, will insist and operate to transport and export its oil through the Strait of Hormuz."[2]

On the background of Iran's threats to interrupt maritime traffic in the Strait of Hormuz on April 2019 an American naval task force was sent, under the command of the

1 Deutsche Welle, dated 22.7.18 https://www.dw.com/en/iranian-president-hassan-rouhani-threatens-to-close-strait-of-hormuz/a-4477737 also quoted in an article by Alexandra Ma dated 13.8.19 https://www.businessinsider.com/strait-of-hormuz-explainer-oil-us-iran-tensions-2019-7

2 https://www.alalamtv.net/news/4198076/%D9%87%D9%83%D8%B0%D8%A7-%D8%B3%D8%AA%D8%B5%D8%AF%D8%B1-%D8%A7%D9%8A%D8%B1%D8%A7%D9%86-D9%86%D9%81%D8%B7%D9%87%D8%A7% dated 2.5.19 in a lecture given to students of religious studies.

aircraft carrier "Abraham Lincoln" in order to demonstrate presence and project power in the Gulf of Oman /the Arabian Sea. Since its arrival in the area, in the month of May 2019, the aircraft carrier remained in the Arabian Sea, and refrained from crossing the Strait of Hormuz into the Persian Gulf. On November 19th the aircraft carrier "Abraham Lincoln" sailed into the Strait of Hormuz and entered the Persian Gulf for the first time. Its entrance into the Persian Gulf has as predictably raised the tension levels between the two countries.

It is unclear whether the entry of the American aircraft carrier into the Persian Gulf, at the height of the tension with Iran, was meant for a demonstration of presence and for deterrence from an Iranian intent to reenact another attack against one of United States' allies, or its arrival at the Persian Gulf along with significant deployment of attack aircrafts including F-35 aircrafts in the area, and including the deployment of more American forces, was in preparation for an upcoming American attack as punishment measures for the Iranian offensive activity that has been occurring since mid-2019 against the oil tankers and against the Saudi oil facilities (events that will be reviewed later).

Iran threatened a number of times in the past to block the Straits of Hormuz, however this time accompanied the threat a practical and tangible expression in the form of delay and detention of tankers in the Persian Gulf in the area of the straits by the Iranians. Additionally, the tension around oil tankers traffic increased in other focal points as well, outside of the area of the Strait of Hormuz, such as the Strait of Gibraltar and in the center of the red sea, this time against tankers in the service of Iran.

The "tanker war" in the eighties during the Iraq-Iran war

The reinforcement of American forces in the Persian Gulf since the middle of 2019 on the background of concern that the Iranians intend on taking action against American target or against targets in the gulf countries that are allies of the United States, bring us back to the eighties of the last century, to the prolonged Iraq-Iran war. In this war Iran stood against a similar problem of an increasing damage to its oil exportation abilities, an act that was initiated at the time by the Iraqi President, Saddam Hussein, in order to cause a decrease in its income and a severe damage to Iran's economy.

The Iraqis were focused then on bombing the Iranian oil infrastructures in the Persian Gulf and within Iran itself, and expanded the bombing to foreign tankers that came to load Iranian oil, that were therefore damaged, in what was nicknamed at the time "The Tanker War". The Iranians on their side decided to execute oppositional measures and to respond in military ways against Iraq's allies in the gulf, and threatened (in May 1984)

to prevent oil exportation from the gulf entirely, especially against Saudi Arabia and Kuwait that assisted Iraq at the time. They also threatened to attack ports, oil facilities and other essential targets in these countries .By that Iran hoped to put an international pressure on Iraq to stop the siege on oil exportation from its ports in the Persian Gulf.

From now on things got complicated. There is no doubt, that the disruption of shipping in the Persian Gulf damaged both sides equally, as it reduced their income from oil exportation. Saudi Arabia and Kuwait were also hurt by this "Tanker War" as it continued full-on at least until the end of 1987. Due to the concerns of Kuwait Principality that is located near Iraq, the United States agreed that an American flag will be raised on Kuwait's oil tankers in order to deter in that way any attack on them.

However, despite of the raising of United States' flag on the tankers, or maybe because of it, the disruption in the tankers' traffic continued, and in July 1987 the tanker "Bridgeton" that raised the United States flag, got hit by an Iranian mine. There were many events in which the Iranians hit tankers that belong to United States' allies between the months of July-October 1987, including with marine mines and shore-sea missiles.[3]

The United States saw in these acts a provocation and a direct insult to it. It should be noted that during these years the United States was dependant on oil from the Middle East. At the end of that year (1987) began a certain calming in the situation, probably because the Iranians understood that the continuation of their attacks on Kuwait and Saudi Arabia and damaging the shipping to them, will cause an acute American reaction that will significantly worsen their situation.[4]

The current "Tanker War"

Since this "Tanker War" in the eighties, there were a couple more events of increased tension on the background of freedom of navigation in the Strait of Hormuz, when Iran threatened a number of times to block the Strait of Hormuz, for instance in 2011 or in 2015. However, this time, since mid-2019, probably due to the tightening choke-tie of the economic sanctions, the threat is accompanied by practical and tangible expressions, that don't require special interpretation regarding the question of who is standing behind them. Additionally, Iran stopped and hindered in different claims, tankers that sailed in the area of the straits.

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3 The Campaign on The Seas- The History of Maritime Power, by Meir Sas, digital edition, https://benyehuda.org/read/12016, chapter 24

4 Iran- To Learn from History's Lessons, by Pesah Melubani dated 13.5.19, an article in https://www.israeldefense.co.il/he/node/38483 And also, Suyin Haynes dated 23.7.19 https://time.com/5632388/strait-of-hormuz-iran-tanker

The first event happened in 12.5.2019, when four oil tankers were attacked across from the port of Fujira in the UAE. The port of Fujira resides in the open sides (the Ocean side) of the Strait of Hormuz, and the attack was probably a signaling that this port cannot serve as a bypass to transport oil through pipes out of the Persian Gulf to ports such as Fujira.[5]

In June 13th, 2019 two oil tankers were attacked, the one belonging to Norway and the other to Japan, which sailed in the Gulf of Oman. The United States accused Iran for being involved in the attack, Iran denied.[6]

Picture 1: One of the two tankers which was hit in June 13th, 2019[7]

Seven days later Iran intercepted an American UAV that flew near the Strait of Hormuz. For a short while there was anticipation for an American reaction, however it wasn't realized. President Trump claimed that this kind of a reaction would have brought many victims, and so he would prefer to impose heavier sanctions, and not perform military retaliation.

At the beginning of the month of July 2019, a huge tanker by the name of 'Grace 1' was intercepted in Gibraltar by special British forces. The tanker sailed around Africa with

5 What we know and what is still unknown about the attack on the four tankers in the Strait of Hormuz, 15.5.19, http://iglobali.com/?p=89004

6 The events that occurred in May-June 2019 are covered in a variety of sources, including in Alexandra Ma's article (in the link in footnote number 1 above). Also, in Pazit Rabina's article from 27.7.2019 https://www.makorrishon.co.il/international/157949

7 ibid

crude oil cargo that was intended for Syria. The tanker was released after about 50 days and continued its sailing to the east of the Mediterranean Sea.

On July 10th 2019, an attempt was made by the Iranian Revolutionary Guards to intercept to no avail a British tanker that sailed in the Persian Gulf. A British frigate intervened and balked the interception of the tanker.

On July 18th Iran's Revolutionary Guards succeeded at diverting from its course a tanker that operated for the UAE and caused it to arrive at the shores of Iran in the Persian Gulf.

On July 19th 2019, Iran hindered two British tankers that were sailing in international waters near Iran. One was released soon after, but the other, "Impro Stena", remained in Iranian detention until the end of September 2019.

With that, in September 14th a widespread attack on oil targets in Saudi Arabia was carried out by UAVs and cruising missiles that were launched from Iran's territory. According to one of the versions the Iranians began planning this attack on May 2019 in order to punish the United States for its retirement from the nuclear deal, and for the worsening sanctions against it from the United States.

By this version the Iranians planned on attacking, among other target, a seaport in Saudi Arabia. Finally, it has been decided to settle for an attack of oil targets of the company Aramco in Saudi Arabia.[8]

On October 11th 2019, an Iranian tanker named 'Sabiti' that was sailing in the Red Sea west to the Saudi Jeddah port was damaged by two hits of some weaponry that was used against it. The perpetrators' identity is unknown, and since October the event has been investigated by the authorities in Iran.

On November 30th 2019 deputy commanding officer of the Iranian navy, Muhammad Mousavi, declared that Iran will respond to the terrorist attack against the oil tanker that occurred in the month of October.

His words imply that the perpetrators' identity has been revealed.[9] On the first week of January 2020 the United States terminated Qasem Soleimani the commander of the Iranian Quds force and the one responsible for the exportation of the Iranian revolution to the area, and that only after a number of events of missile shootings on American

8 An article by Reuters agency, cited in the website https://news.walla.co.il/item/3325801 And also, in the website- https://www.israeldefense.co.il/he/node/41052. Both articles are from 25.11.19.

9 Iran navy starts mass production of 'Jask' cruise missile, unveils other military projects https://www.presstv.com/Detail/2019/11/30/612482/mass-production-of-Jask-cruise-missile

bases in Iraq and an attempt to penetrate into the United States' embassy in Baghdad. As part of these events the United States reinforced its forces in Iraq.

Basic geographical data and changing factors

In the Middle East there are four bottlenecks (marine choke-points)[10], that are of international strategic significance: the Strait of Hormuz, the two ends of the Red Sea- the Strait of Bab el Mandeb at the south of the Red Sea and the Strait of Jubilee and Suez Canal at the north of the Red Sea. The fourth chokepoint is the Turkish straits: the Dardanelles ant the Bosporus that connect between the Mediterranean Sea and the Black Sea.

Out of these four choke-points Iran dominates and controls or influences two. It dominates and controls the Strait of Hormuz since many years ago. Additionally, it significantly dominates and influences in recent years the Strait of Bab el Mandeb in the south of the Red Sea, that is since it deployed sponsorship over the Houthi rebels in Yemen while equipping them with the best of advanced weapon systems including drones, ground missiles and rockets and marine weaponry such as mines and marine missiles.

The northern exit of the Red Sea and Suez Canal is exclusively under Egyptian control; however, it's used from time to time, as a target for terrorist acts from groups that are not necessarily related to sponsorship organizations of Iran. However, when Iran will want to escalate its hostile activity in Suez Canal it'll definitely be able to do so as it initiated at the time, in 1984 (during the Iran-Iraq war) marine mining in the Gulf of Suez. Libya, which during those years supported Iran in its war with Iraq, executed the mining mission probably to the request of Iran; this was through a RORO[11] ship owned by it (the ship "Gat"). The goal was to punish Egypt for supporting Iraq and to disrupt weaponry transport to the Iraqi military from Suez port in the southern opening of Suez Canal to ports in Aqaba or in Saudi Arabia.[12]

10 Regarding this topic see an article from a strategic update, Vol 14/ issue 2/ July 2012: Marine "Bottlenecks" To the Vulnerability of Sea-Straits in The Middle East by Yoel Gojenski, Galia Lindenstrauss, Jonathan Schecter. It should be noted that in the original article its authors mention three marine bottlenecks. Due to Iran's increasing influence and presence in recent years in the south of the Red Sea, due to the sponsorship it bestows over the Houthis in Yemen, the current article refers to Bab el Mandeb as a another bottleneck that stands independently and is separate from the bottleneck of the Gulf of Suez and Suez canal.

11 RORO: Roll on/Roll off ship.

12 Levie, Howard. Mine Warfare at Sea. Dordrecht, NL: Martinus Nijhoff, 1992.

For the Turkish straits, they're of course completely out of Iranian control or influence today, it is also unclear whether Iran today has even a need or such interest in the area, as they might have had before in ancient times, in the period of the Persian empire and its maritime wars with the Greeks.[13]

Even if Iran will actualize its geo-strategic ambition in the future and will establish maritime presence in the coasts of Syria, it's unlikely it'll strive to influence this marine bottleneck, as it'll, probably, come across strong resistance from Russia and Turkey.

Out of these four marine bottlenecks, we will focus in this article, on the background of the events of 2019, on the Strait of Hormuz and on the Strait of Bab el Mandeb at the south of the Red Sea. These two focal points were mentioned in the statement that was given by the Iranian navy commander, Admiral Hossein Khanzadi, on the last week of November 2019, and which implied that Iran will take action against any threat that will be placed from hostile countries on its oil tankers in the Persian Gulf and in the Red Sea. [14]

Figure 2: The Iranian navy commander - Hossein Khanzadi

13 Xerxes's maritime wars against the Greeks in the fifth century BC. A wide variety of sources about the Persians and their Phoenicians allies' use in the Turkish straits. Including Meir Sas's book "The Campaign on The Seas", chapters F-G (digital edition in footnote number 3 above).

14 A statement made by Hossein Khanzadi, in the end of November 2019, during which he addressed the Iranian navy's presence in the Gulf of Aden and in the Red Sea. https://www.alalamtv.net/news/4566591/%D8%A5%D8%B1%D8%B3%D8%A7%D9%84-64-D9%85%D9%86-%D8%A7%D9%84%D9%82%D8%B7%D8%B9-D8%A7%D9%84%D8%AD%D8%B1%D8%A8%D9%8A%D8%A9-%D8%A7%D9%84%D8%B9%D8%B3%D9%83%D8%B1%D9%8A%D8%A9-%D9%84%D8%AE%D9%84%D9%8A%D8%AC-%D8%B9%D8%AF%D9%86-%D8%AD%D8%AA%D9%89-%D8%A7%D9%84%D8%A7%D9%86

The Persian Gulf and the Strait of Hormuz – Basic data and changing factors

Iran borders with two marine areas; one is the Caspian Sea that Iran has coasts of about 700 km in length within it and its significance stems from its proximity to the capital city Teheran, for its natural resources, as well as the neighboring countries in Asia and in Europe (Russia). Iran's second marine space is the Persian Gulf and the Gulf of Oman, an area that this article will discuss.

The Straits of Hormuz connect the Persian Gulf (the Arab countries and especially Iran's neighbors in the Arabian Peninsula call it the "Arab's Gulf") with the Gulf of Oman, the Arab Sea and the Indian ocean. The straits are located between Iran in the north and Oman and Saudi Arabia in the south.

This route of shipping is one of the busiest in the world, because the alternatives for oil or gas transportation through pipes aren't significant. It is estimated that about 21 million barriers of crude oil are transported through the Straits of Hormuz every day. Farther more it is estimated that close to a third of all seaborne oil trade through the Straits of Hormuz, so is about 20% of all-natural gas. Attached below for illustrating the volume of traffic, a map that shows marine traffic in the Strait of Hormuz on the 5th of July 2019.

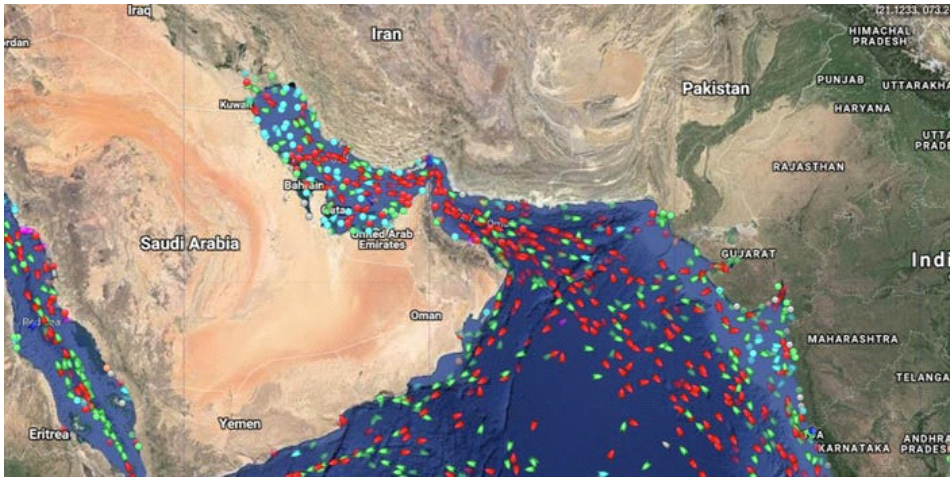

Figure 3: A map that illustrates marine traffic in the Strait of Hormuz on July 5th 2019.[15]

15 MarineTraffic.com, dated 5.7.19. The picture was taken from an article by Alexandra Ma (see footnote number 1 above).

The width of the Strait of Hormuz at its narrowest area is about 33 km; however, the width of the international shipping route stands at about 10 km only. The shipping route in the entrance to the Persian Gulf resides in Oman's territorial water, but a little later on from there, tankers are getting closer to islands under Iran's control- seven out of eight main islands near by the Straits of Hormuz from the west. The straits are international and lead from the Arab Sea into the Persian Gulf and serve as an only naval exit for a number of countries in the gulf (Iraq, Kuwait, The United Arab Emirates, and Qatar).

Below is a map that describes the naval border in the Straits of Hormuz, between Iran and Oman, according to the agreement that was signed between the two countries in 1974.

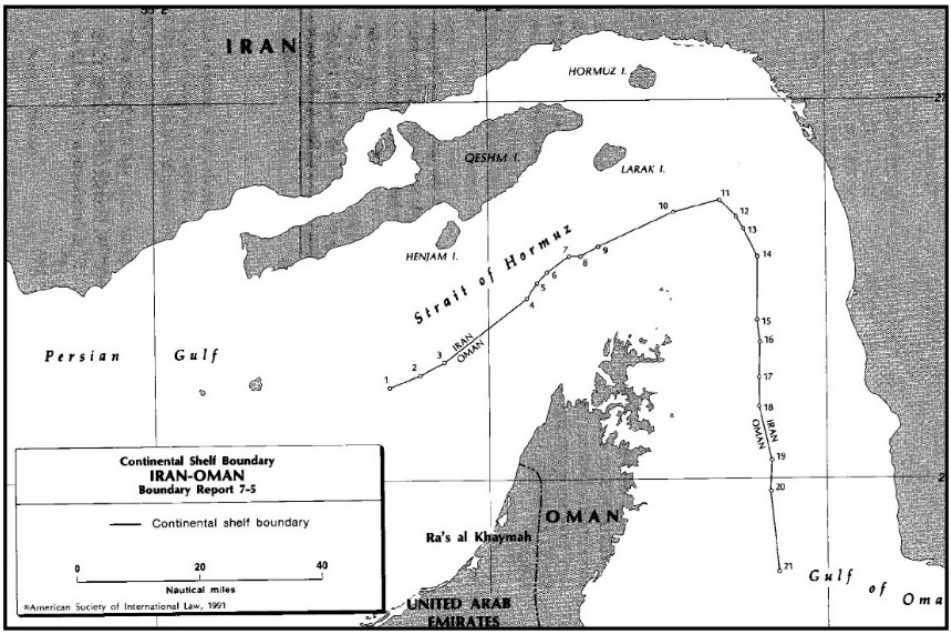

Figure 4: A map that describes the naval border in the Straits of Hormuz, between Iran and Oman, according to the agreement that was signed between the two countries in 1974.[16]

Comparing to its neighbors in the Arab Peninsula Iran is enjoying a geographical advantage. Its coasts in the Persian Gulf and in Oman bay stretch over the two sides of the Strait of Hormuz at a total length of about 2,300 km. Out of them more than 1,400 km within the Persian Gulf, from the Strait of Hormuz in the east and until the border with Iraq in the north-west. In this section of the Iranian coast, and in close proximity to

16 Vol 2 p1507. Charney Jonathan I and Alexander Lewis M "International Maritime Boundaries"

the Straits of Hormuz, is located the main port of Iran, port Bandar Abbas, that serves as the main base of the Iranian navy.

The length of the second section of the Iranian coast is about 850 km in the northern bank of Oman bay, from the Straits of Hormuz and until the border with Pakistan in the east. In this section of the Iranian coast is located Chah-Bahar port that resides in close proximity to the naval border with Pakistan.

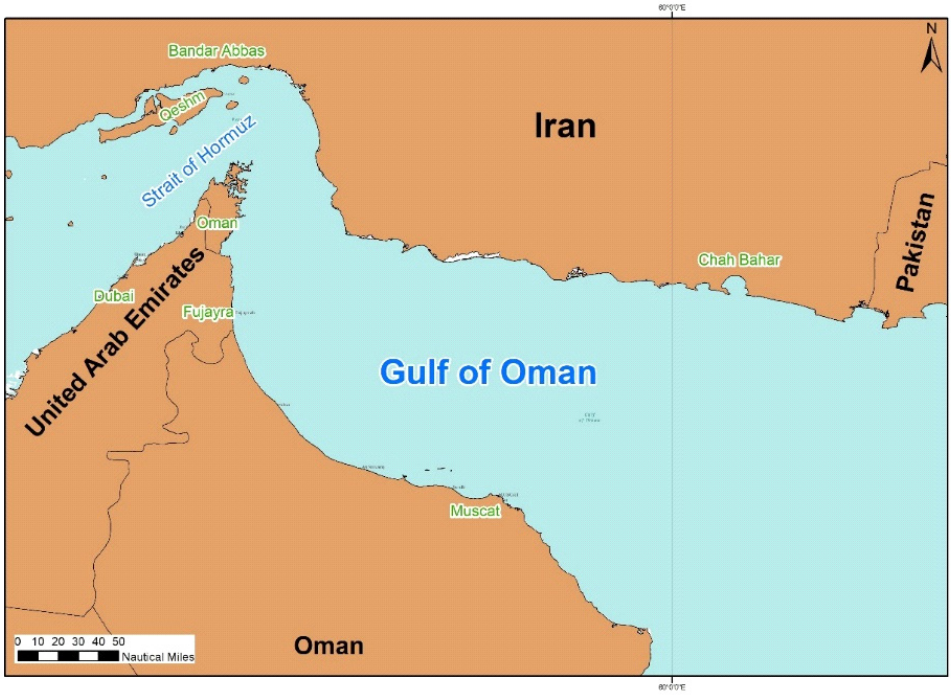

Figure 5: The Iranian coast in the Gulf of Oman (self-processing computer)

That is, Iran controls the Strait of Hormuz from both of its sides (before the strait and after) with weaponry systems, discovery and control systems so as aircrafts and sea crafts that belong to the Iranian navy and to the maritime arm of the Revolutionary Guards. Additionally, a group of islands within the Persian Gulf in Iran's sovereign waters, and that some of them are used as operational and logistical bases used by the navy and the maritime arm of the Revolutionary Guards.

One of the most prominent islands in the Persian Gulf and that belongs to Iran is the island Qeshm, that resides next to the southern coast of Iran. The island's size is about 1500 sq. km, its maximal length is 136 km and its maximal width is 40 km. Due to its

location it is of high strategic importance. Another island within the Persian Gulf, west to Qeshm Island and smaller than it is, is Kish Island. This island was mentioned in the past as the one in proximity to was executed, in December 2001, weaponry load onto a cargo ship owned by PLO. It was the ship Karin-A that the Revolutionary Guards' loaded with a great deal of weaponry of a variety of types, weaponry that was meant for the Palestinian Authority in Gaza strip.[17]

Figure 6: Shipping routes in the Straits of Hormuz

Straits of Bab el Mandeb and the south of the Red Sea- base data and changing factors

Bab el Mandeb is a sea strait separating Asia (Yemen in the Arab peninsula) and Africa (Djibouti and Eritrea in Africa), and connects the Red Sea and the Gulf of Aden in the Indian sea. Its width is about 28 km. Perim Island that divides the strait into two, and its eastern part is about 3 km wide and about 30 meters deep, and its western part which is about 25 km wide and it's maximal depth is over 300 meters.

That same Perim island, that is near the Yemen side of the strait, was used in June 1971 as an exit base for an attack squad of the Popular Front organization of George Habash and his deputy Wadie Haddad, that emerged out of the island on a speed boat

17 Amos Gilboa, Drama in the Red Sea : the untold story how Karin A, a Palestinian ship carrying arms, was captured by Israeli navy special forces. pages 227, 235.

that launched a number of RPG rockets towards the tanker Coral Sea, that was on its way from the Persian Gulf to a fuel terminal in Eilat.[18] The straits of Bab el Mandeb are also remembered as a naval bottleneck in the days of Yom Ha'kippurim War (1973) since the breakout of the war and until the first separation agreements between Israel and Egypt were signed in November 1973. In that war the Egyptian navy activated a naval blockade in the south of the Red Sea in order to prevent tankers traffic in the service of Israel from the Persian Gulf to Eilat's port and vice versa. For the purpose of implementation of this blockade the Egyptian navy operated two destroyers and a frigate that were based on friendly ports in the north of Yemen (Hodeidah Port) and in the south of Yemen (Aden port).[19]

Figure 7: The straits of Bab el Mandeb and Perim island that's closer to the east bank of the strait

With that in 1990 north Yemen and South Yemen united, and the People's Republic of Yemen was established. The Arab spring that emerged in the beginning of the current decade did not skip United Yemen's countries. In 2011 the country got into internal struggles. One of the sects that were and are affiliates to these struggles are the Houthis - an ethnic zaidi-shia group in Yemen. Due to the organization's shia character

18 Zeev Almog, Israeli navy commando commander – Cruises of My Life, Kineret, Zmora Bitan, 2014, pages 720-724.

19 A wide variety of sources that reviewed and analyzed the course of the war between Egypt and Israel during October 1973. including , an interview in 2012 with Ashraf Raafat, who was the Egyptian navy's head of operations division in Yom Ha'kippurim war: https://www.elbalad.news/287297

the Houthis are having friendly relations with Iran and Hizballah and see Sunni bodies such as Saudi Arabia and El-Qaeda in the Arab peninsula as enemies.

Gradually the Houthis gained power across Yemen until in February 2015 they announced that they actually control Yemen as a whole. The Houthis received significant assistant from Iran, including advanced weaponry that enabled them the victories in campaigns that were run by them inside of the Yemen territory and against the neighboring countries such as Saudi Arabia and the United Arab Emirates.

The sponsorship that the Iranians deployed over the Houthis in Yemen gives them in recent years considerable control over the straits of Bab el Mandeb in the south of the Red Sea- an important naval strait that is used for international shipping navigation from the Mediterranean Sea and the Red Sea to the Arab Sea and the Indian Ocean. [20]

The potential control and naval threat from Iran in the south of the Red Sea, naturally arises concern amongst Sunni pro-western countries that border in the Red Sea, such as Egypt and Saudi Arabia. However other countries as well that use the Straits of Bab el Mandeb including tankers transportation from the Persian Gulf to European markets through the Red Sea and Suez Canal.

At the same time, it's estimated that Iran itself has an interest, at present time, that shipping routes in the chokepoints of the Red Sea (Bab el-Mandeb and Suez Canal) will operate freely and will be open for shipping. Therefore, as much as the current tension will increase and broaden into hostile activity in low or medium intensity, it will hence be expressed mainly in the area of the Persian Gulf and the Straits of Hormuz. To the extant that the hostile activity will be in higher intensity, while the Iranian regime will feel its existence is in danger, there might come into play also hostile activity in the Red Sea from Iran and the Houthis.

The Iranian naval factor – military and civilian

In accordance with its ambitions to be a regional power in the Middle East and in the Indian Ocean, Iran has built its naval abilities while leaning on its marine arm that includes two components. One component is the Iranian navy that receives in recent

20 For more information about the Iranian-Houthi relations in its maritime context see Maritime Strategic Assessment for Israel 2016, page 98, http://hms.haifa.ac.il/images/publications/Report_2016/Full-Report-2016_17-HE.pdf And also: In Maritime Strategic Assessment for Israel 18/19, page 93, http://hms.haifa.ac.il/images/pdf/report_2019.pdf And also: A Senior Egyptian Author Warns: The Missiles Supplied by Iran To the Houthis Are A Threat to Suez Canal as Well. http://www.memri.org.il/cgi-webaxy/item?4563 and also: Uzi Rubin's article from 7.10.19: South Arabian Missile War: Israel's Lessons https://jiss.org.il/he/rubin-missile-war-in-southern-arabia

years resources and priorities with the aim of being "a green waters navy"[21] as befits a regional maritime power. The second component is the Revolutionary Guards' naval force which is tasked with offensive and defensive missions mainly in the area of the Persian Gulf, however it has long arms for giving assistance, guidance and inspiration to maritime proxy forces in the same focal points that are employed sponsorship over by Iran: such as Yemen ruled by the Houthis, Lebanon ruled by Hizballah, Gaza strip which was ruled in the past by the Palestinian authority and in recent years assistance to the Islamic jihad and Hamas organizations. Not to mention the Iranians' involvement and attempts to control Assad's Syria.

Since the Islamic revolution in 1979, there has been a competition and rivalry between the two bodies mentioned above. However it can be assumed that in the circumstances of confrontation or escalation the Iranian navy and the naval Revolutionary Guards force will collaborate in order to reveal defensive and offensive teeth against hostile forces from western countries or from pro-western countries in the Middle East in order to take them down. It's possible that the fact that Admiral Ali Padavi, who was the Iranian navy's commander in the past, is the Revolutionary Guards' deputy commander currently, can contribute to operational and techno-logistical collaboration between these two bodies in circumstances of threat. Each of these two components has the ability to complete Iran's marine readiness in the defensive area as well as in the offensive area.

In addition to these militaristic marine components the existence of advanced and extensive civil shipping infrastructure in Iran cannot be ignored, and the regime can recruit it in order to contribute to the security effort regularly and to the war effort in the maritime range in case of a confrontation. Recruited elements of the Iranian merchant fleet were used before and can be used in the future as platforms for weaponry transportation, as outstretched focal points of control and intelligence, and in special

21 The term "green waters" is relatively new and refers to a naval force with an ability to operate far outside the sovereign waters of its country including capability to operate in a nearby ocean. It is actually a classification that bridges "brown waters" navy/coast guard that refers to navy or coast guard capable of carrying out guard operations or military operations in limited ranges in limited ranges in the naval area that is included in the country's territorial waters areas, and between "blue waters" navy that is a marine superpower force capable of operating worldwide, across the oceans, and to demonstrate control and power in far and wide ranges including the presence of combat groups in the center of which are aircraft carriers.

occasions may act as platforms manned by people and naval commandos so as UAVs and sea to sea missiles. [22,23]

Summary and conclusions

Since the collapse of Saddam Hussien's regime in Iraq, following the two Gulf Wars in 1991 and 2003, Iran is increasingly standing out as a regional power that gains military and political powers not only in the areas of the Persian Gulf, but in other focal points as well such as Lebanon, Syria and Yemen. Iran's empowerment and the increase in its regional status and confidence stem from the decline that has began in the last two years in the status of the Sunni bloc as a whole, and in Saudi Arabia's status in the region specifically, especially the lack of reaction after the resounding attack against Saudi targets in the middle of September 2019.

The accumulation of events since the cancellation of the nuclear agreement by the Trump administration, and even more so since the worsening of the economic sanctions on Iran in 2019, are putting the naval arena in west north of the Indian sea (especially in the marine bottlenecks in the Straits of Hormuz and in the Strait of Bab el Mandeb) as tension focal points that may erupt at any time.

Iran's leader, Ali Hamaney, gives great importance to the marine range, in which he sees a sphere that can add to Iran's deterrence and its expansion aspirations. In Hamaney's opinion, Iran's marine ability has to include an offensive dimension- such as through possible siege over the Straits of Hormuz, and a defensive dimension- by fending off possible offensive activity from the west against Iran from the sea. Hamaney sees the upgrading of the Iranian's navy abilities as another important component in turning Iran into a regional power.[24]

For this reason, the Iranian navy is given recently special resources in order to increase its power, including independent development capabilities of marine weaponry (including missiles and UAVs), as well as self construction of marine weaponry, including destroyer ships. At the launch ceremony of two new destroyer ships from the

22 Ayal Finko, Greater Marine Strategic Assessment for Israel 18/19, page 80.

23 Omer Dostri, The Iranian Maritime Threat: Meanings and Implications for Israeli and Regional Security, Jerusalem Institute for Strategy and Security, June 12th 2019. https://jiss.org.il/he/dostri-iranian-naval-threat/?fbclid=IwAR1g7Ir4HPTq9Qm8-GVVuKIakpMoJ79YbyDZ8S8ud6ugP7YMhbmi6kqfLvI

24 ibid.

model "Alborz", in the beginning of 2019, the Iranian navy commander Khanzadi gave a quite pretensions statement that the Iranian navy is ready to explore the Atlantic.[25]

Considering the marine power and independent technological development of weaponry that Iran gained during the last decades- abilities that are very much relevant in an environment of heavy economic sanctions against it- there's no doubt that it is a Middle Eastern country with a maritime strategy. As such it has abilities, by the opening factors at least, to escalate the marine confrontation between it and western countries, and the United State especially, and between it and its neighbors in the Arab peninsula or even between it and Israel that has no common border with Iran, but might be drawn into a military confrontation initiated by Iran. In this context it is worth mentioning that the Iranian presence and influence in the south of the Red Sea may be a threat to shipping traffic as a whole, and shipping traffic which is related to Israel specifically. Egypt too, that the traffic volume in Suez Canal is important to its economy, won't stand aside if Iran will threaten its freedom of navigation in the Straits of Bab el Mandeb.

The exacerbation of tension in Egypt may influence greatly crude oil prices. The game in the energy market is wider, and the questions are whether Saudi Arabia which has the world's largest oil reserve will offset the Iranian oil shortage, so as what will be the Russian policy which has a great interest in raising oil prices since its economy is heavily dependant on oil prices? Yet it should be noted that oil prices in the world have increased by only a few percent after the attack in Saudi Arabia, and that increase was also halted after a few days, facts indicating great flexibility and the existence of reserves in the world's oil markets.

As far as Iran is concerned, the question is if beyond provocation steps taken by it so far in the Persian Gulf; it will continue escalating the "Tanker War" in a similar scope to the war that has taken place in the eighties? At the time it walked a thin rope, as remembered, until it understood it mustn't exaggerate and make the Americans respond back in an acute to a fatal response.

This article is not focused on hostile Iranian activity against Israel in the near future, however, some mentions regarding the potential damage in shipping related to Israel in the south of the Red Sea can be noted, so as the foreign minister's Katz's comments quoted saying that Israel incorporates in the United States' move for securing the

25 "Looking West: Iran Is Ready to Explore the Atlantic", Jerusalem Institute for Public and State Affairs. December 5th 2019.

shipping in the Persian Gulf in intelligence aspects and in other fields in which it has a relative advantage.[26]

The more there will be hostile activity against Israel, it will not necessarily be directly related to the "Tanker War" that surged in 2019. In Iran's view, it supposedly has unresolved issues with Israel against the backdrop of Israel's repeated attacks against the Revolutionary Guards' targets and against Hizballah's targets in Lebanon. Furthermore, an outbreak of hostilities in the Persian Gulf, including hitting some American target by the Iranians, can be exploited and accompanied by hitting an Israeli target at the same time, similarly to the strategy taken by the Iraqi ruler, Saddam Hussien, during the first Gulf War when he launched ground missiles towards Israel.

26 Foreign Minister Katz Revealed: Israel Participates in Shipping Routes Security Coalition in The Persian Gulf, Itamar Ichener, YNET, June 6th 2019.
https://www.ynet.co.il/articles/0,7340,L-5564712,00.html

The Egyptian Navy – Its Origins and its Future

(Is it on its way to becoming a "green water" navy?)[1]

Shlomo Gueta

Introduction

In recent years, and particularly during the last five years under the rule of el-Sisi, there have been many articles written on the acquisition programs and growth in power of the Egyptian navy and the development of its maritime infrastructure. Summing up those analyses paints an impressive picture of ambitious acquisition, which includes state-of-the-art naval platforms, rather than the second-hand platforms acquired in the past. The list of acquisitions during the current decade includes new submarines from Germany, frigates and multipurpose surface warships from France, Germany and the US, and the process is continuing, including possibilities of acquisition from Russia and from Asian countries. In addition to the acquisition of platforms, Egypt is equipping itself with a variety of advanced naval weapons systems, including aircraft for naval missions.

Some of the researchers and analysts are concerned about Egypt's growing naval power and view it as part of a desire to confront Israel in the future. In other words, this growth in naval power will in their view be used by Egypt in a future scenario of escalation, erosion of the peace treaty or actual war against Israel. This approach is based on past experience (the surprise attack during the Yom Kippur War in 1973, including the intelligence failure and the erosion of indicators prior to the war) and on the following advice in the Book of Proverbs (28:14): "Happy is the man that feareth alway; but he that hardeneth his heart shall fall into evil."

Other researchers and analysts that are following the process view the growing strength of the Egyptian navy as a natural and structured extension of the process that began at the beginning of the 19th century. This was a process initiated by the founders of modern Egypt, starting from Muhammad Ali in the first half of the 19th century, continuing with Gamal Abdel Nasser who ruled Egypt from 1952 to 1970 and ending with Abdel Fattah el-Sisi, the de facto leader of Egypt since 2013 and the de jure leader from 2014. Each had his own motives and style in realizing the vision of making Egypt a regional naval power.

1 This article is a condensed version of the draft of a broad historical survey of the Egyptian navy from 1800-2020. The survey is written by the author of this article and is in the final stages of writing and editing.

This article does not claim to decide between these two approaches. Nonetheless, it is worth mentioning that the peace treaty between Israel and Egypt is an important strategic interest that is shared by both countries. It has been in effect for four decades, including during the brief rule of President Morsi, who was supported by the Moslem Brotherhood, an organization that is hostile towards Israel.[2] Furthermore, Egypt currently faces a large number of challenges and threats in the regional maritime domain which forces it to provide a response on two fronts: in the Mediterranean and in the Red Sea up to the Gulf of Aden. This is against the background of the important role of the Suez Canal in the Egyptian economy and the discovery of natural gas in the Mediterranean (and indications of similar resources in Egypt's economic waters in the Red Sea).

In terms of maritime strategy, there are those who view the intensive efforts to strengthen the Egyptian navy as motivated by the vision to achieve a "green-water" navy.[3] Such an analysis appears for example in an article published in July 2017 by a Greek researcher by the name of Theodore Bass-Yannis.

This chapter reviews the process to strengthen the Egyptian navy and the view of the author that at the conclusion of this ambitious process the Egyptian navy will likely achieve the status of a green-water navy. In order to be precise, following is a relevant quote from the article:[4]

> **Assessing the Future Egyptian Navy –** After the completion of this ambitious modernization program, it can be assumed that the Egyptian navy will be either a "**Green Water Navy**" or what G. Till refers to as a "medium level naval power capable of projecting power offshore in a regional range."

2 The Moslem Brotherhood movement was founded in Egypt by Hassan al-Bana in 1929. Sheikh Ahmed Yassin, the founder of the Hamas movement in Gaza, was a member of the movement and the Hamas has a similar ideology to that of the Moslem Brotherhood.

3 "Green water" is a relatively new term which relates to naval power with the ability to operate outside a country's sovereign waters, including in a nearby ocean. This is essentially a classification that bridges between a "brown-water" navy/coast guard, which is a force that can guard the coast or can operate within a limited range in the maritime domain, including the country's territorial waters, and a "blue-water" navy that is a superpower's navy, which is able to operate around the world and in the open seas, and is able to maintain a presence and to project power at great distances, including the presence of battle groups, and in particular aircraft carriers.

4 Egyptian Navy upgraded - Seeking for security or an indication of strategic aspiration?, Theodore Bazini, 29 July 2017 Naval Analyses, https://www.navalanalyses.com/2017/07/egyptian-navy-upgraded-seeking-for.html

The Egyptian navy – historical background

The 19th century[5]

In 1805, an energetic officer of Albanian origin named Muhammad Ali became ruler of Egypt. In order to realize his political aspirations, Muhammad Ali understood that he would need naval power. Together with his sons, and in particular his son Ibrahim Pasha (who in his youth was a cadet of the admiral of the Ottoman navy), began to develop a naval fleet. At first, the ships were primitive and based on large fishing vessels that were built in Cairo and were then brought to Suez and Alexandria. At a later stage, and with the help of the French navy, more advanced vessels were built.

Figure 1: Muhammad Ali personally supervising the building of ships for the navy

At the request of the Ottomans, the Egyptian navy under the command of Ibrahim Pasha was used to help put down the revolt of the Greeks against the Ottoman empire. The Egyptian naval adventure in the Greek Archipelago ended in October 1827 with the battle at Navarinon, between the Ottoman-Egyptian navy and a joint naval fleet of Britain, France and Russia. It is worth mentioning that this was the last great naval battle between sailing warships. The joint Ottoman-Egyptian fleet was defeated and a

5 For further details on the history of naval forces in Egypt during the 19th century, see: Shimon Shamir, *History of the Arabs in the Middle East in the Modern Era*, Reshafim, Tel Aviv, 1987. [Hebrew]

year later Ibrahim was forced to surrender and to leave Greece. The defeat in this battle motivated Muhammad Ali to work to establish a modern navy with the assistance of a French expert. The building of the new ships began in 1828 and in 1831 the first ship, which was outfitted with 100 guns (!) and was named after Pasha Muhammad Ali, was launched.[6]

The naval adventures of Muhammad Ali and his son Ibrahim continued during the 1830s, this time against the Ottoman empire, as part of a naval and land campaign to capture the Land of Israel, Lebanon and Syria, during which the Ottoman fleet surrendered to Egypt. However, under pressure from the superpowers, Muhammad Ali and his son were forced to return the Ottoman fleet in the early 1840s and to sign a peace treaty with the empire.

After the deaths of Muhammad Ali and his son Ibrahim in the mid-1800s, the Egyptian navy became involved in the Crimean War. At the request of the Ottomans, Egypt sent a military force consisting of about 12 warships to the Black Sea in order to assist the Ottoman empire in its war against Russia. During the battle of Sinop in the Black Sea in November 1853, the Russian navy destroyed and sank the Ottoman and Egyptian fleet that was anchored in Sinop. The commander of the Ottoman navy was captured and this Russian victory was among the reasons that France and England entered the war.

Almost until the middle of the 20th century (a period of almost 100 years), Egypt's naval forces were in a process of decline. Most of the ships in Egypt's once great navy became outdated wrecks. Even the small core of the merchant fleet, which was built during the period of the ruler Ismail, was sold for a pittance to British buyers at the end of the 19th century as a result of Egypt's accumulated debts. This deal led to the disappearance of the Egyptian merchant fleet until it was reestablished during the first quarter of the 20th century.[7]

At the same time, the hold of the Ottoman empire on Egypt slowly weakened during the second half of the 19th century. During this period, during which the Suez Canal was dug and then inaugurated in 1869, France's influence over Egypt grew and later that of Britain as well. Towards the end of the 19th century, Britain achieved almost complete control over Egypt, including its maritime assets (its ports and the Suez Canal), during and between the two world wars.

6 Ibid., Dodwell, p. 223.

7 Ibid., Shamir, p. 176.

The 20th century

During the first three decades of the century, the civilian shipping industry recovered to some extent in Egypt with the beginning of operations by two Egyptian-owned shipping companies; however, the naval forces remained negligible and neglected and included primarily postal ships and coast guard vessels, which were meant to prevent smuggling.

In 1946, after a period of stagnation that had lasted 100 years, the Egyptian navy was reestablished on the order of King Farouk. From 1948 until 1974, the Egyptian navy took an active part in all the conflicts with Israel (the War of Independence in 1948, during which the ship el-Amir Farouk, the flagship of the Egyptian fleet, was sunk by Israeli commandos commanded by Yohai Ben Nun; the Sinai Campaign in 1956, during which the destroyer Ibrahim el-Awal was captured off the shore of Haifa; the Six Day War in 1967; the War of Attrition in 1969-1970; and the Yom Kippur War in 1973).

During this period, it is particularly worth mentioning the period of President Gamal Abdel Nasser from 1952-1970 in the context of the buildup of naval power. President Nasser invested major efforts in building up the Egyptian navy, which reached a peak during the Six Day War (June 1967). This buildup (starting with the Czech deal[8] in 1955) was made possible by aid from the Soviets, who sought to achieve a permanent naval presence in Egypt's ports in return and particularly after their naval presence in Albania came to an end in 1961. There was a major buildup of the Egyptian navy during this period and it included first-line warships,[9] such as destroyers, submarines and missile boats (which were first introduced into the Middle East by Egypt), torpedo boats, submarine hunters and minesweepers. In addition, the navy also acquired second-line vessels and coastal defense systems including coastal missiles, coastal artillery and detection and fire control systems.[10]

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8 The Czech deal was a large weapons deal signed between Egypt and the Soviet bloc in September 1955. From a naval perspective, the deal included major vessels, such as destroyers and submarines from Poland's military surplus, as well as torpedo boats and other vessels. The first of the ships to be included in this deal were delivered during the first half of 1956 while the delivery of the rest was delayed by the Sinai Campaign and only arrived in 1957.

9 First-line vessels include as missile boats, frigates, destroyers and submarines and are defined as having offensive capabilities. Second-line vessels are intended for defensive missions, transportation and logistics, etc.

10 The description of the buildup of the Egyptian navy during the period 1955-1967 is based on a variety of sources: the annual publication of Jane's Fighting Ships; the book by el-Hussini (the former head of the Egyptian navy's history department): Mohrez Mahmoud El-Hussini, Soviet & Egyptian relations, 1945-86; Pesah Malveni, Red Flag over the Middle East, Effy Meltzer Ltd., first edition, 2017 [Hebrew]; Alexander Rozin, *Naval Cooperation between the USSR and the Egyptian Navy*, part 1 and 2 of the collection of articles at http://alerozin.narod.ru

It is worth mentioning the nationalization of the Suez Canal in July 1956 by Nasser and the transfer of its control to Egypt. This provided Egypt with a major maritime asset that became an important source of revenue for the Egyptian government (which was used to finance the building of the Aswan Dam by the Soviets), as well as providing an international political tool (in this context, it is worth mentioning the confiscation of Israeli cargo that was passing through the Canal).[11] From this point onward, the Egyptian navy also became responsible for securing the canal.

Nasser's vision to achieve for Egypt the status of a regional superpower was based on the doctrine of "three circles" that he developed: the Arab circle, the Muslim circle and the African circle. Apart from the ideological component, Nasser, as well as Admiral Suleiman Ezzat, the well-known commander of the Egyptian navy at that time, viewed the role of the navy as providing a response to Israel and also to the possible threat from the navies of the Western superpowers. This was particularly the case in view of the trauma Egypt had experienced in 1956 during the Sinai Campaign and the confrontation with France and Britain over the nationalization of the Suez Canal.

From a regional point of view, two events in the Arab world that Egypt was involved in are worthy of mention. The first was the Egyptian-Syrian union during 1958-1961 which constituted a major potential threat to Israel in the maritime domain in view of the two countries' joint naval force. This union was dissolved in 1961 at the initiative of Syria and to the disappointment of Nasser.

The second event was the Yemen War during 1962-1967, a war that Egypt was deeply involved in. It appears that the main adverse effect of this war was on Egypt's land and air forces. The Egyptian navy on the other hand was only marginally involved. Its units were not involved in actual combat and their missions were limited to the transport of land forces, weapons and logistical supplies, an effort to which merchant vessels were also recruited. Overall, the military involvement in Yemen does not appear to have had a major adverse effect on the Egyptian navy (as it did on the other arms of the Egyptian military).

Prior to the Six Day War (1967), the Egyptian navy reached the peak of its power following a massive buildup based on acquisitions from the Soviet Union. During the war itself, the navy was a major disappointment for President Nasser since it did not carry out the offensive maneuvers against Israel that had been expected of it. It is reasonable to assume that this was due to the fear of the Israeli air force, which during

11 See, for example, "A third shipment is confiscated. Nicholas Kahiris is a sacrifice to the Egyptian blockade of Suez", http://jpress.org.il/olive/apa/nli_heb/SharedView.Article.aspx?href=MAR/1959/03/26&id=Ar00201 [Hebrew]

the first hours of the war had destroyed much of the Egyptian air force, and the fear of the commander of the navy to operate without air cover outside its home ports. Due to the underperformance of the Egyptian navy during the war, Admiral Ezzat was relieved of his position by President Nasser, even though he was an admired commander. (The new Ambassador-class frigate built in the US was later named after him.)

The outcome of the Six Day War (1967) was a major blow to Egypt's prestige. In the maritime domain, this was an unprecedented low point. The Suez Canal was blocked to traffic, which represented a major loss of revenue for Egypt, and as a result the Egyptian navy was divided between two fronts, without any possibility of connecting between them, apart from transporting small vessels, parts and ammunition over a long and poorly maintained land route (such as the Wadi Kinah route in the western desert).

The dominance of the Israeli navy and it presence opposite the shores of the Sinai Peninsula (the Gulf of Eilat and the Gulf of Suez) was also a blow to Egyptian prestige, due both to the production of crude oil from oil fields in the Gulf of Suez and the ability of Israel to carry out offensive naval maneuvers in the Gulf of Suez, such as, for example, the raid on Green Island (Bulmus 6) and the Island of Shaduan (Operation Rhodes) or the amphibious landing of an armored force in the Gulf of Suez (Operation Raviv) in September 1969, which was a shock to Egypt, and led to the immediate firing of the commander of the navy by President Nasser (about one year before the Yom Kippur War, he was restored as commander of the navy by President Sadat).

In comparison to its lack of activity in the Six Day War, it is worth mentioning that during the years 1967-1970, the period of the War of Attrition, the Egyptian navy recovered somewhat and carried out a number of missions that raised morale in Egypt and in the navy in particular. An example is the sinking of the INS Eilat, an Israeli destroyer in October 1967, northeast of Port Said, by for the first time a Soviet-produced sea-to-sea missile. Since then, the day of the sinking of the Eilat is marked as the annual Egyptian Navy day.

In addition, it is worth mentioning the success (from the Egyptian point of view) of the sabotaging of Israeli ships in the port of Eilat, which was carried out by commando of the Egyptian navy (1969-1970) following Operation Raviv[12] (apparently in order to deter Israel from additional operations), as well as the sabotage in western Africa of

12 Operation Raviv was a raid by an armored IDF force on September 9, 1969, during the War of Attrition. An Israeli armored force that was disguised as Egyptians was landed amphibiously on the western shore of the Gulf of Suez, where it attacked military targets along a 70-km strip. This was the largest single land operation during the War of Attrition.

an offshore drilling rig that was on its way to Israel and was intended for use in the production of oil in the Gulf of Suez. It is also worth mentioning the shelling of the northern shore of Sinai in November 1969 by a pair of Skori destroyers (which have an improved anti-aircraft capability) that were guarded by Ossa missile boats and a number of patrols by submarines of Israel's Mediterranean coast in order to gather intelligence.

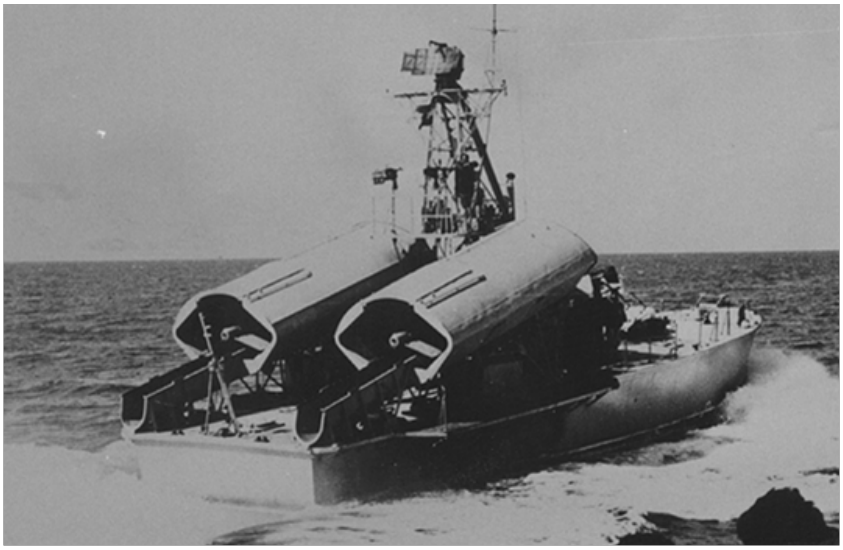

Figure 2: A Komar missile boat. Two of these vessels launched four missiles that sank the Eilat destroyer. (Photo from the northern Gulf of Suez provided by Azran Kochavi.)

Between 1970 and 1973, the Egyptian navy, like the other arms of the Egyptian military, prepared for the Yom Kippur War. It acquired almost no new vessels during this period based on the understanding of the Egyptian leadership that the navy is weak in any case due to the inferiority of the Egyptian air force and its inability to provide air cover to the navy.[13]

It appears that during the years of preparation for the Yom Kippur War, the main theater for the Egyptian navy was the Red Sea, where there was only a limited threat from the Israeli air force. It was given two important strategic/operational tasks:

1. The blocking of ships to and from Israel in the central and southern Red Sea by means of submarines and destroyers that prevented traffic to and from the port of Eilat.

13 Saad el-Shazali, *Crossing the Canal*, IDF Publishing, 1987, p. 16-17 (memoir of the Egyptian Chief of Staff during the Yom Kippur War). [Hebrew]

2. The mining of the southern Gulf of Suez, primarily the Jubal Straits, in order to disrupt the flow of tankers carrying crude oil produced in the Gulf of Suez to the oil pipeline in Eilat (the mines caused the sinking of the tanker Sirus which was in service for Israel while it was on its way from Eilat to the Gulf of Suez).

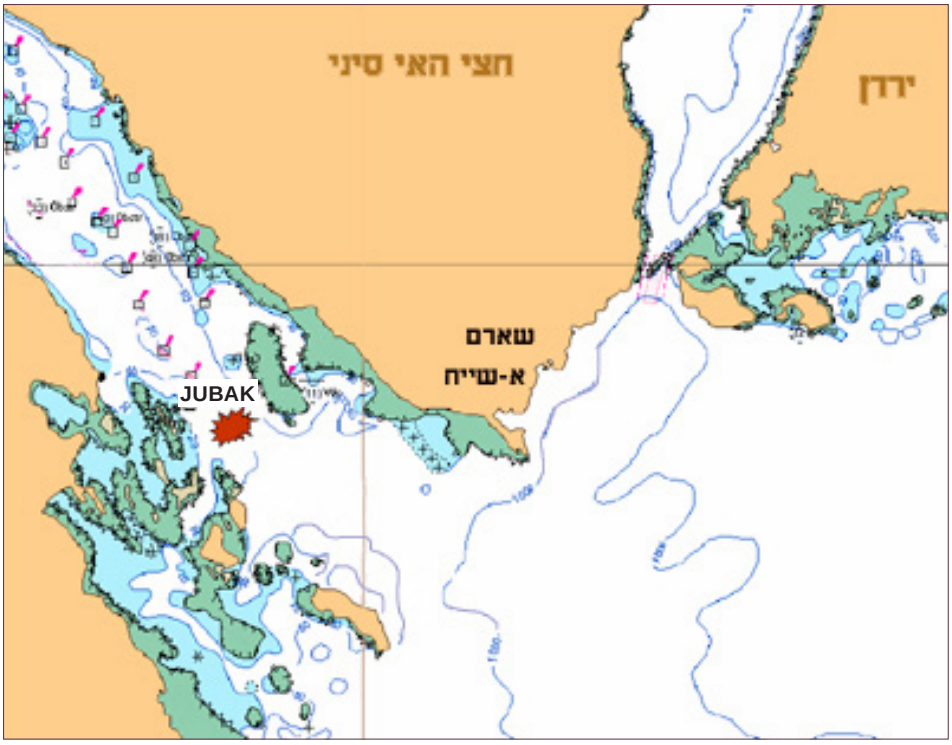

Figure 3: The Jubal Straits – southern entrance to the Gulf of Suez.

From the viewpoint of the Egyptian navy, these two tasks were carried out successfully. Moreover, the mission of blocking Israeli shipping in the Red Sea was even more successful, since it served as major leverage for Egypt in the negotiations to lift the Israeli blockade of the Third Army on the shore of the canal. However, the task of laying about 70 sea mines was only partially successful since the Israeli navy managed within a short time to create an alternative route to the Jabal Straits (through the Milan Straits) and as a result the traffic of naval vessels and tankers was restored.

Along with the two main tasks assigned in the Red Sea, which the Egyptian navy successfully carried out, a number of other missions were assigned to it on the tactical/operational level which it failed to carry out. These included the attempt to block shipping to Israel in the central Mediterranean by strengthening a previously existing presence

in Libyan ports; and the total defeat in sea-to-sea battles against Israeli missile boats in the Mediterranean, which led to the confinement of the Egyptian navy to its ports in the Mediterranean. There was also a disruption of activities of the Egyptian naval commandoes in the Gulf of Suez, which were meant to be part of an Egyptian effort to capture the eastern shore of the Gulf of Suez from Ras Masala in the north to the vicinity of Sharm el Sheikh in the south and which was unsuccessful.

Peace with Israel

If the first half of the 1970s was characterized by the war and the preparations for it, then the second half was characterized by harbingers of peace. Following the Yom Kippur War, ceasefire agreements were signed, and the Suez Canal was opened to shipping in June 1975 after having been blocked for eight years. Finally, a peace agreement was signed between Egypt and Israel in 1979.

The peace between the two countries also included a maritime element. In September 1979, President Sadat and his entourage arrived for a presidential visit in the port of Haifa on the presidential yacht (called el-Houria and which in the past was called Mahrusa and which was built for the ruler Ismail to mark the opening of the Suez Canal in 1869). The yacht was accompanied by a flotilla that included a destroyer and pair of missile boats. A few months later (in May 1980), a flotilla of Israeli missile boats visited the port of Alexandria.

Figure 4: An OSA-class missile boat accompanied by an Israeli missile boat at the entrance to the port of Haifa in September 1979

Since the Yom Kippur War, the Egyptian navy has not taken part in any combat activity except for dealing with maritime terror activity during the last two decades, as will be described below. Its main efforts in the years following the Yom Kippur War were

invested in acquisition. This was a result of the decision to eliminate its dependence on Soviet naval arms and to diversify acquisitions by also purchasing from Western Europe (Britain, France, Italy and Spain) and at a later stage also from China. This process began during the final years of Sadat's rule and continued during the period of Hosni Mubarak, his successor. Since the early 1990s, and following the First Gulf War, the Egyptian navy began receiving naval arms from the US, including US navy surplus surface vessels.

Figure 5: An Israeli missile boat entering the port of Alexandria in May 1980 against the background of the Ras el Tin Palace

Since the peace treaty with Israel at the end of the 1970s, the Egyptian navy has been opened to the Western world not only with respect to acquisition and buildup, but also with respect to large-scale cooperation, such as joint exercises, training, instruction, adoption of fighting doctrines and maintenance. In the context of joint training and exercises, it is worth mentioning the Shining Star exercises with the US, which began in the early 1980s and included the navies of both countries, exercises with the navies of Britain, France and Greece and in at least one instance (in 2012) with the Turkish navy in the Mediterranean, as well as with the Saudi navy in the Red Sea.

The 21st century

The flow of naval acquisition during the rule of President Mubarak (1981-2011) continues, although during the last decade of his rule there was no major buildup of first-line vessels. During this decade, the Egyptian army primarily assimilated used second-line vessels. However, towards the end of President Mubarak's rule, at least

two important acquisition contracts were signed for the building of major new vessels. The first was for the building of four Ambassador-class missile corvettes in the US; and the second, which was signed towards the end of Mubarak's rule, was for the building of the first pair of 209-class submarines in Germany.

The main momentum in the acquisition for the Egyptian navy, which has been widely reported on and discussed in recent years, was particularly evident during the past five years, since the coming to power of President Abdel Fattah el-Sisi in Egypt.

As in the case of two previous leaders, namely Muhammad Ali in the 19th century and Gamal Abdel Nasser in the 20th, who had a vision of Egypt as a regional naval power, it is reasonable to assume that President el-Sisi also maintains such a vision, both in the case of the Red Sea theater and the Mediterranean theater. This is in view of the maritime assets that need to be protected and the map of threats and challenges that currently face Egypt – from both state players (such as Iran, Yemen, Turkey and Libya) and terror organizations operating in the maritime domain (Al Qaida, ISIS in the Sinai Peninsula and Libyan territory, the Houthis in Yemen and to some extent the maritime pirates in the Gulf of Aden and the Arabian Sea).

The buildup of the Egyptian navy during the last decade

Following are the characteristics and trends of the buildup of the Egyptian navy in recent years:

- **Submarines**: The Egyptian navy has acquired four 209/1400-class submarines from Germany. Three of them have already been built and delivered and the fourth is under construction. Apparently, the deal with the German shipyard will include another two submarines. This German model is added to the Romeo-class submarines made in China, which were delivered to the Egyptian navy in the 1980s and which have undergone upgrading in recent years, including the installation of American weapons system, such as the Harpoon missile.
- **Multi-purpose surface ships**: There is a huge selection for category of ships, both with respect to sources and types and models. This category generally includes ships that are custom-built for the Egyptian navy rather than second-hand ships, as in the past. Included in the list of ships that have been supplied in recent years and which will be supplied in coming years are helicopter and troop carriers, destroyers, frigates and corvettes:
    - Two Mistral-class helicopter and troop carriers that were built in France, originally for delivery to Russia, but which in the end were delivered to the Egyptian navy in 2015. One of the carriers is named after Gamal Abdel Nasser and the other after Anwar Sadat. When the "Southern Navy" was officially

created in January 2017, with its headquarters at Safaga, one of the new carriers was stationed there and at the same ceremony the flag of the Egyptian navy was raised on it.

- Four Ambassador-class missile corvettes made in the US were delivered to the Egyptian navy during the years 2013-2015 and they are referred to as Ezzat-class in Egypt (after the previously mentioned commander of the Egyptian navy from 1952-1967). The other three corvettes are also named after former navy commanders.
- A Fremm-class multi-purpose destroyer/frigate made in France and originally intended for the French navy, but later purchased by Egypt in the second half of 2015.
- Four Gowind-class multi-purpose corvettes made in France. The first was built at a shipyard in France while the other three were built or will be built in the Alexandria shipyard according to the agreement.
- A pair of Pohag-class frigates (in this case, second hand) made in South Korea were delivered as a gift to the Egyptian navy in 2017.
- A Moniya-class corvette (project 1242) made in Russia was delivered to the Egyptian navy in 2015, apparently without missiles.
- It recently became known that the German government has approved the sale of four Mako-200-class frigates, which will be built at the ThyssenKrupp shipyard in Germany.
- Apart from the buildup in new platforms, it is worth mentioning that from time to time the Egyptian navy upgrades and improves the vessels it received in previous decades, such as the OHP-class frigates that were delivered in the 90s from American army surplus.

• **Aircraft for naval missions**: A variety of aircraft for various missions, such as early warning and command, and fighter aircraft for attacking maritime targets, should be included in a description of Egypt's naval power. Recently, the acquisition of the naval version of French-made Dassault Rafale aircraft, equipped with air-to-sea missiles and/or Mig-29 M aircraft that will be armed with kh-31 missiles, has been considered or even decided upon. The Egyptians already have a large quantity of naval helicopters which are intended for either submarine hunting or assault and troop carrying. In addition, dozens of KA-52K helicopters have been delivered from Russia for stationing on the Mistral helicopter carriers.

• **Special forces**: Under the command and control of the Egyptian navy are two divisions of commandos for land missions and frogmen trained for underwater operations to sabotage ships. One division is meant to operate as part of the "Southern Navy" which is headquartered at Safaga and the other is meant to operate in the Mediterranean.

In summary, the buildup in recent years has been characterized by the acquisition of large multi-purposes ships that will have the ability to operate independently and far from their home port. In addition, there is clearly a desire and a large measure of determination on the part of Egypt to demand concessions from the foreign shipyard to build or assemble some of the vessels in Egypt.

Characteristics of the maritime theater

The Egyptian maritime theater has unique characteristics due to, among other things, the fact that Egypt is situated at an important geopolitical junction in the Middle East. Egypt has long borders and a large portion of them are maritime borders. Egypt's Mediterranean coast and its Red Sea coast are together about 2500 km long. The coastal areas along the Nile are densely populated, in contrast to other parts of Egypt. Many of Egypt's strategic assets and resources are located in its coastal strip.

The Suez Canal which connects the Mediterranean to the Red Sea between Port Said in the North to Port Ibrahim in the South is about 162 km long. The canal is an important strategic asset both for Egypt and the world, which emphasizes and reinforces Egypt's regional importance as a junction that connects between the Atlantic and the Mediterranean on the one hand and the Indian Ocean on the other. With his coming to power and election as President in 2014, Abdel Fattah el-Sisi initiated a large-scale and ambitious project to widen the Suez Canal, with the goal of making it into a two-way channel. The project was completed at an exceptionally rapid pace and the "New Suez Canal" was inaugurated in August 2015. There is no doubt as to Its strategic and economic importance for Egypt and its protection is one of the most important tasks of the navy and the defense forces in Egypt.

During the last two decades, important assets have been added to the maritime domain in the form of energy resources and in particular reservoirs of natural gas found in Egypt's economic waters.

Both the Suez Canal and the natural gas reserves (proven in the Mediterranean and forecasted in the Red Sea) have led the Egyptians to invest heavily in the development of ports for military use at three locations: the first at Gargoub near the border with Libya; the second located east of Port Said in the northeastern Suez Canal; and the third at Ras Banas in the Red Sea near the border with Sudan.[14]

14 Mahmoud Gamal, February 1, 2019, Egypt's navy modernization, The growth of new power in the Middle East.
https://navalnews.net/egypts-navy-modernization-the-growth-of-new-power-in-the-middle-east

The deployment of three bases that the Egyptian navy is intending to upgrade is an indication that it wishes to have a presence in both the Red Sea (apparently even south of the Bab el Mandeb Strait) and the Mediterranean, including of course the Suez Canal, which is an essential channel connecting the two theaters.

In view of the characteristics of the theater and the variety of challenges and threats currently faced by the Egyptian navy, a strategic decision was made to reorganize the Egyptian maritime domain and to divide the navy into two parts: the "Southern Navy" in the Red Sea and the "Northern Navy" in the Mediterranean. This division was made in order to improve the efficiency of the navy and its operations. The idea is that each navy should be suited to its theater and should have an independent ability for operation, with the goal of minimizing the dependence between the two theaters that existed in the past, and in particular during the eight-year period in which the Suez Canal was blocked.[15]

Egypt's economic waters

Egypt began to produce offshore crude oil during the first half of the 20th century, primarily from oil fields in the Gulf of Suez. Later on, starting from the end of the 1990s and in particular during the current decade, there was a dramatic discovery of natural gas fields between Alexandria in the west and the northern shore of Sinai in the east, within Egypt's economic waters.

Egypt's vision is that by 2030 it will be producing natural gas to provide for all its domestic needs (which are increasing as the population grows) on the one hand and that there will also be a surplus for export on the other hand.

Moreover, Egypt's offshore wealth will grow in the future as the natural gas fields in the Red Sea (in addition to those in the Mediterranean) are developed and begin producing. There are expectations in Egypt that the Red Sea will be the next major area for exploration. In February 2019, Neptune Energy, a Norwegian company, won the concession to develop the natural gas fields in Block 4 in the Red Sea, which stretches from south of Ras Gharb in the southern part of the Gulf of Suez to about 100 km north of the port of Ghardaqah. In September 2019, an additional tender was closed for gas exploration in ten blocks in the Red Sea.

As things appear now, Egypt's maritime domain in the Mediterranean and in the future probably also in the Red Sea contains valuable natural resource that are essential

15 For further details on the "Southern Navy" in the Red Sea and the "Northern Navy", see Shai Shaul, "The Egyptian navy in the Red Sea", January 2017. https://www.idc.ac.il/he/research/ips/Documents/publication/5/ShaulShay16_1_17.pdf

to Egypt's economic resilience. There is no doubt among its decision makers, the designers of its national strategy, its political leadership and its military and naval commanders as to the need to protect Egypt's assets in its economic waters.

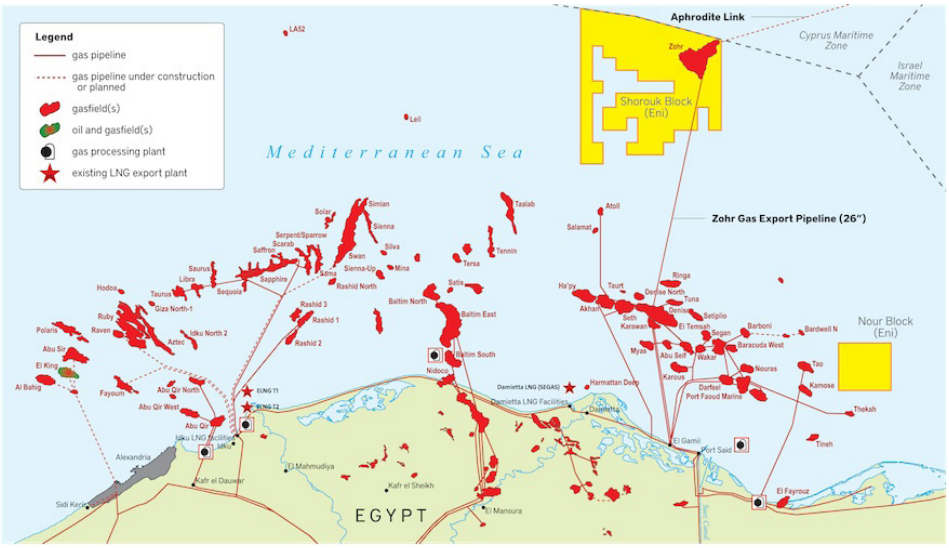

Figure 6: Map of Egypt's natural gas fields in the Mediterranean.[16]

The challenges and threats in the maritime domain and Egypt's response to them

During the 2000s, the Western world, including Egypt and the other Sunni countries, faced the threat of international terror (from the el Quaida movement and its affiliates) including maritime terror. The first maritime terror attack occurred at the beginning of the decade (October 2000) against the American destroyer, the USS Cole, in the Gulf of Aden. This attack and the September 11 one which followed it, provided an indication of the potential of international terror, including that against maritime targets.

Against this background, and following in the footsteps of the US, many countries adopted the doctrine of Maritime Domain Awareness, which included the security and defense of the maritime domain. A not insignificant number of countries have adopted the doctrine, although there is no indication that Egypt has done so even though it

16 Energy Global News, ENI reports new gas discovery in Nour, North Sinai offshore Egypt. http://www.energyglobalnews.com/eni-reports-new-gas-discovery-in-nour-north-sinai-offshore-egypt

fulfills all the conditions, i.e. capital-intensive targets, a long maritime border and more than a few players who are hostile to its interests.[17]

The threat of terror did not diminish during the 2010s. On the contrary, added to the terror equation in 2014 was the murderous terrorist organization known as ISIS, which emerged from the Fertile Crescent region, though it also sent out shoots to the Sinai Peninsula and Libya, Egypt's western neighbor, which has been torn apart since the civil war there and the deposing of Qaddafi.

The activities of ISIS in Sinai have surprised observers and have included attacks on targets in Sinai and in Egypt proper. In the maritime context, two terror attacks are noteworthy. The first, in November 2014, involved the attempted takeover of a Tiger-class missile boat which was on a routine patrol from Port Said. In the exchange of fire with the hijackers the Egyptians were forced to destroy the ship.[18] The second occurred in July 2015 when a group of terrorists launched an antitank missile at an Egyptian coast guard ship that was anchored off Sheikh Zuweid in northern Sinai.[19]

Other terror threats in the maritime domain during this period primarily included plans to attack merchant ships sailing in the Suez Canal, with the goal of disrupting the movement of ships in it. One prominent example of such an attack, which was unsuccessful, was the launch of RPGs at the Cosco Asia container ship in July 2013.[20]

Apart from the intensification of maritime terror, it is also worth mentioning the phenomenon of maritime pirate activity in the Gulf of Aden, which originates from Somalia, and which is certainly not in Egypt's interests since it is liable to reduce traffic through the Suez Canal and in turn Egypt's revenues. Despite the potential risk to Egypt, it does not appear that the Egyptian navy has taken any specific actions in order to become part of the international community's effort to end this phenomenon.

17 For further details on the doctrine of "Maritime Domain Awareness", see Ram Erez, *The Maritime Strategic Evaluation for Israel 2018/19*, Maritime Policy and Strategy Research center, University of Haifa, p. 142 http://hms.haifa.ac.il/images/reports/HE_Report_2018_19/Ram-Erez-2.pdf.

18 Many of the details about the incident remain confidential.

19 Egypt navy ship 'hit by Sinai militants' missile, BBC,16 July 2015 https://www.bbc.com/news/world-middle-east-33557180

20 The terror attack on the Cosco Asia in the Suez Canal, the Cosco company, September 1, 2013 http://www.coscoshipping.co.il/article/%D7%97%D7%93%D7%A9%D7%95%D7%AA/%D7%94%D7%AA%D7%A7%D7%A4%D7%AA-%D7%98%D7%A8%D7%95%D7%A8-%D7%A2%D7%9C-%D7%94-Cosco-Asia-%D7%91%D7%AA%D7%A2%D7%9C%D7%AA-%D7%A1%D7%95%D7%90%D7%A5

Figure 7: The Cosco container ship that was the target of an attempted terror attack in the Suez Canal (source: see footnote 16).

With respect to maritime threats from state players, the unrest in the Arab world during the current decade was also manifested among countries that have maritime borders with Egypt, whether in the Mediterranean or the Red Sea, such as Libya in the west, Syrian in the north (including the renewed Russian naval presence in the Mediterranean) and Yemen in the south. Added to this are the threats from countries that are not traditional rivals of Egypt in the Middle East. On the one hand, there is Turkey, a Sunni country, whose regime currently supports the Moslem Brotherhood which is hostile to el-Sisi's regime; on the other hand, there is Shiite Iran whose maritime aspirations (based on the Iranian Navy and the Maritime Revolutionary Guard) have been to expand beyond the Persian Gulf to the Indian Ocean and the Red Sea (by means of, among others, their allies, the Houthis) and with a potential presence in the Mediterranean based on a possible future foothold on the Syrian coast and the establishment of a naval presence there.

Egypt also faces long-existing threats in the Red Sea from Sudan and Ethiopia, through which flow Egypt's lifeline – the Nile River.

It is true that the maritime challenges and threats facing Egypt and its economic assets (particularly the Suez Canal and the offshore oil and gas fields) change from one period to the next; however, the current scale of these threats is forcing Egypt to provide an appropriate maritime response, both in the theater of the Red Sea and apparently also in the Gulf of Aden south of the Bab el Mandeb Strait and in the Mediterranean domain, at least up to the central Mediterranean in the west.

There is no doubt that Egypt's maritime domain, which includes the Mediterranean, the Suez Canal and the Red Sea, and its assets and resources, constitute a cornerstone of Egypt's national security policy.

In the context of Egypt's response to its maritime threats and challenges, it is fitting to quote Farik Ahmed Khaled Hassan Said, the commander of the Egyptian navy, from a speech he gave last October on Egypt's Navy Day:[21]

- Egypt's well-trained navy, with its advanced naval weaponry, is aggressively fulfilling its mission to protect the shores of Egypt and its territorial waters, to protect economic targets, to enforce Egypt's law at sea and to preserve Egypt's sovereignty in its territorial and economic waters, in addition to fighting terror.
- The naval forces are protecting Egypt's coasts in the Mediterranean and in the Red Sea 24 hours a day and with the participation of all of its sections, in order to protect Egypt's ports, its shipping lanes and passage through the Suez Canal.
- The naval forces are responsible for protecting Egypt's borders, its interests and its resources in years to come and they are ready to deal with the challenges facing the Egyptian people in current and future theaters.

It would appear that the navy commander's words reflect the vision and strategic perspective of the current Egyptian leadership, which are inspired by President el-Sisi.[22]

Egypt's maritime domain, which includes the Mediterranean, the Suez Canal and the Red Sea, and its assets and resources, constitute a cornerstone of Egypt's national security policy. Therefore, it is not surprising that the Egyptian navy has in recent years received a large budget share in order to carry out its buildup and development program.

The following question then arises: Is Israel included in the list of threats in the maritime domain? As long as the current regime is in place in Egypt, it is fairly safe to say that

21 This is a quote from a film clip published on YouTube to mark Egyptian Navy Day in October 2019 and which included a speech by the commander of the navy. Highlights of the speech were translated by Pesach Malveni.
https://www.youtube.com/watch?v=8DNMJIX_o78&feature=youtu.be

22 With regard to el-Sisi's view of naval power, it may be that he views the goal of the future buildup of the Egyptian navy as, among other things, a way to transform Egypt into a regional superpower that can intervene on behalf of its allies and can protect its economic assets in the Mediterranean and the Red Sea (protection of the huge EEZ, as well as the Suez Canal and the freedom of passage to and from it, and outside of Egypt's territorial waters, including the Bab el Mandeb Strait in the southern Red Sea). See Eran Lerman, "The Keystone: Sisi, Egyptian Stability and the Future of the Eastern Mediterranean".
https://jiss.org.il/en/lerman-keystone-sisi-egyptian-stability-future-eastern-mediterranean/

Israel is not viewed as a threat. On the contrary, if it was possible to copy Israel also on its western border (instead of Libya) or its southern border (instead of Sudan), the Egyptians would gladly do so. A strong Israel on Egypt's eastern border is an Egyptian strategic interest, at least from the current regime's point of view and in view of its bloody and determined war against ISIS in Sinai.

Does Israel constitute a challenge to the Egyptian navy? Apparently it does. The Israeli navy is viewed in Egypt as a powerful player that serves as a benchmark (in the spirit of: "tough in training, easy in combat"); on the other hand, it is viewed as a role model, as expressed by the saying: "The grass is greener on the other side."

Summary and conclusions

The naval arsenal included in the buildup of the Egyptian navy during the past decade is an impressive one. It includes advanced submarines from Germany and in the future perhaps from China as well; helicopter carriers from France; and multipurpose ships, frigates, corvettes and submarine hunters from the top shipyards in Western Europe, the US, South Korea, Russia and China. Added to this are of course a variety of aircraft for naval missions, as well as a large variety of weapons systems and electronic equipment, which are also produced by the top defense manufacturers in those countries.

There are those who claim, with some justification, that the Egyptian navy is acquiring platforms and weapons wherever they can. On the one hand, there is an advantage in a lack of dependency on a single supplier. On the other hand, there is some doubt as to whether the navy has the ability to operate and properly maintain ships and weapons systems from many different sources, from both a technological and techo-logistic standpoint in the long run.

And again, the question that was raised earlier in the chapter: Is the Egyptian navy seeking to be included within the definition of a green-water navy, as predicted by the researcher Bass-Yannis?

On the one hand, from the viewpoint of the types, quantity and quality of the platforms and the systems they carry, the completion of the buildup process will place the Egyptian navy among the most advanced and modern navies in the Middle East, in two theaters of conflict: the Mediterranean and the Red Sea.

On the other hand, the real test of a navy that is seeking to become a green-water navy is not just the buildup of power, i.e. the quantity and tonnage of its vessels. In order to be included in the definition of a green-water navy, the Egyptian navy must pass

other tests in the use of power, in addition to the buildup of its platforms and weapons, including cooperation with other players in the domain with which it has joint interests; a high level of maintenance, including the capabilities for independent development, building and production; and the training of professional manpower.

Theodore Bazini, who predicts that the Egyptian navy will in the future become a green-water navy, believes that Egypt is a historic player that is crucial to the stability and security of the region. According to him, the new naval modernization is "a holistic strategic approach in alignment with contemporary and future geopolitical demands and a response to dynamics arising from maritime environment… building a ''green navy'' signals a U-turn, in pursuit of an enhanced role in the area."[23]

On the other hand, more than a few commentators are pessimistic about the ability of the Egyptian navy to meet the criteria of a green-water navy and in particular on the operational and maintenance levels. In the opinion of the author of this chapter, it is too early to draw conclusions and it is certainly possible that we will be surprised in this context, since at stake is Egypt's economic prosperity, which will lead in the future to unlimited financing capabilities.

With respect to maintenance, it is worthwhile quoting Mahmoud Gamal (an Egyptian commentator who is freely translated here): "Egypt now needs to give consideration to the solution of maintenance and logistic support problems for the vessels that recently went into service or which will go into service in the near future, since if this issue is not resolved it will be a real nightmare for the navy."[24]

In addition, he (justifiably) sees the necessity to improve the capabilities of the Egyptian air force and the arming of advanced aircraft produced in France and Russia, including air-to-sea missiles that can provide air cover for ships of the Egyptian navy.[25]

In conclusion, the unprecedented and unique buildup of the Egyptian navy during the last five years needs to be monitored. It is reasonable to assume that the buildup of Egypt's naval power is meant to provide Egypt with the status of a regional naval power, in view of the challenges and threats it currently faces and especially in view of the economic resources in its maritime domain that need to be protected. It is in Israel's interest to cooperate with the Egyptian navy in view of the two countries' common interests in the region. On the other hand, the potential risk implicit in this buildup of naval strength in the event of a change in regime in Egypt cannot be ignored.

23 Ibid., Theodore Bazini.

24 Ibid., Mahmoud Gamal.

25 Ibid., Mahmoud Gamal.

Egypt is one of the only countries in the Middle East (besides Turkey and perhaps also Iran) that has a naval strategy—if not de jure, then at least de facto—as a result of the following factors:

- Egypt has a navy with a long history and it has increased in strength in recent years, based on a strategic vision that is meant to achieve regional power status for Egypt.
- Egypt is a maritime junction that sits astride the shipping routes between the Atlantic and the Mediterranean on the one hand and the Red Sea and the Indian Ocean on the other.
- Egypt has a developed a maritime infrastructure of ports and coastal installations, which are deployed over about 2500 km of coastline in the Mediterranean and the Red Sea.
- Egypt has a large merchant fleet, most of which is nationally owned and which operates and is developed according to a strategic plan for the period up to 2030.[26]
- Egypt has many advanced institutions for maritime education which are training professional manpower for both the military sector and the civilian/shipyard sector.
- Above all, there have been major developments in Egypt's Exclusive Economic Zone, including the discovery and development of natural gas fields (which are proven in the Mediterranean and forecasted with a reasonable likelihood in the Red Sea).

26 A strategy for the development of maritime transport industry and logistics, http://www.mts.gov.eg/en/content/1349-A-strategy-for-the-development-of-maritime-transport-industry

The Contribution of Private Shipyards to Israel's National Security

Nir Zarhi and Shaul Chorev

Abstract

This chapter deals with the need for a private shipyard in Israel as an essential national infrastructure for building military surface vessels for the Israeli navy and for the use of the shipyard's essential infrastructure, with a horizon of more than a decade. In this context, the article discusses the concept of self-reliance, according to which a state relies on its own military industries and in particular in the maritime domain, including a discussion of the various motives for adopting this approach.

The article will discuss the Israeli case, based on a survey of the current and expected situations of the navy and a survey of the shipyard infrastructures of both the navy and the private shipyard (i.e. Israel Shipyards). The article then presents policy recommendations with respect to the need for a civilian private shipyard in Israel, based on the findings of a comprehensive study recently carried out for Israel Shipyards. The study examined the need for a civilian private shipyard in Israel as an essential national infrastructure for the building of military surface vessels for the Israeli navy and for the use of the shipyard's essential infrastructure.

The study recommends a strategy of long-term self-reliance in the construction of military surface vessels for the State of Israel. This will contribute to Israel's national resilience in the domains of security, the economy, industry, technology, education and social welfare. It is also recommended that this domain be based on a military shipyard, i.e. the naval shipyard, which will be responsible for the operational readiness of the vessels, and in particular their ongoing maintenance and their upgrading, and on a private shipyard, which will be responsible for ensuring the ability to develop and manufacturing vessels, systems and naval equipment according to the needs of both the navy and the civilian market (such as the expanding energy market), as well as to provide shipyard services and repair capabilities. Thus, it is recommended that in this context a policy will be defined whereby the maintenance needs of the navy are provided for by the private industry. These will include, among other things, the availability and compatibility of the infrastructures. Thus, it is proposed that the State will be responsible for encouraging this effort by means of two main policy tools. First and foremost, it needs to develop and build military vessels and systems for the navy at the local shipyards. The second is to introduce a component of local value (Offset) in international contracts (G2G) between the State and foreign contractors and primarily in

the maritime domain. At the same time, it is proposed that consideration be given to the approach of "surge capability", a defense strategy that views industry as a "dormant" strategic capability, awaiting a time of emergency. Finally, the study recommends examining the possible development of Haifa as a national maritime hub, in view of its unique elements. This will likely provide a lever for the economic development of Haifa and the North, the creation of a national center for knowledge and expertise and the promotion and advancement of technologies and products in this domain.

Introduction

The self-reliance approach is essentially the capability of the State to arm its military by means of its local defense industry, and thus to achieve autarky.[1] Nonetheless, this approach also allows the State to import weapons systems or armaments from reliable allies, primarily in order to close any gaps in technology and also in order to facilitate the production of modern and sophisticated weapons in order to deal with current threats.[2] In addition to strategic and operational considerations with the goal of defending and preserving the State's sovereignty, this approach also a variety of other motivations, including the encouragement of local industry and employment, the advancement of education and the development of human capital, where its function is to serve as a technological and economic growth engine, in addition to its role as a means of social development and as a component of national prestige.[3] Early on in the history of the State of Israel, a dual approach to acquisitions was adopted and over the years it became the foundation for Israel's defense policy. Thus, no effort was spared to exploit opportunities for acquisitions abroad and at the same time major resources were invested in creating a local defense industry that could supply weapons and military equipment to the IDF.[4] This has made a significant contribution to the State's security (and continues to do so), and the relations between these industries on the one hand

1 Burak Ege Bekdil, 2017. Going it Alone: Turkey Staunch in Efforts for Self-Sufficient Defense Capabilities. *Defense News* (23.4.2017): https://www.defensenews.com/land/2017/04/24/going-it-alone-turkey-staunch-in-efforts-for-self-sufficient-defense-capabilities

2 Timothy D. Hoyt, 2007. *Military Industry and Regional Defense Policy: India, Iraq, and Israel*. New York: Routledge.

3 Hon Lee et-al., 1993. U.S. Pricing Policy on the Sale of M60A3 Tanks. *The House of Representatives* (22.11.1993); Malta, 2016. *PQQ: Offshore Patrol Vessel for the Armed Forces of Malta*. CT3019/2016; page 51; Paul Iddon, 2019. Turkey's Ever-growing Indigenous Arms Industry. *The New Arab* (18.10.2019): https://www.alaraby.co.uk/english/indepth/2019/10/18/turkeys-ever-growing-indigenous-arms-industry; Ron Matthews & Alma Lozano, 2014. Evaluating Motivation and Performance in ASEAN Naval Acquisition Strategy. In G. Till, & J. Chan, *Naval modernization in SouthEast Asia: Nature, causes, and consequences* (pp. 52–73). New York: Routledge.

4 Herstyadi S. Condro, 2017. *Strategy to Improve Naval Shipbuilding Industry Self-Reliance in Indonesia*. Naval Postgraduate School (NPS).

and the defense R&D sector and the various parts of the IDF on the other have always been close. This has facilitated the creation of an essential and innovative operational capability, which is characterized by short development time once the operational need arises and until its use on the battlefield.[5]

In the context of the development and construction of military vessels, there has been a global trend in recent years toward the formulation of national strategies, plans and specialized models. These usually include a component of long-term government investment in the upgrading of the country's navy, as well as collaboration with industry. In this way, conditions are met for repeat investment by industry in infrastructure and technology. In some cases, a degree of foreign acquisition in the short term is also included, with the purpose of importing technology from abroad. All this constitutes a component of resilience within national security and an engine for socioeconomic development and prosperity, while at the same time increasing local economic growth and employment. Such strategies and plans have recently been formulated by some of the naval powers, such as Australia, Britain and Canada, as well as some of the developing nations, such as members of ASEAN.[6] They have traditionally relied on imports from leading global defense producers, in view of their low level of defense production capabilities. They are increasingly building up their national capabilities by mean of domestic production, with two goals in mind – reducing the dangerous reliance on imports while encouraging the development of their domestic industry. Accordingly, a model of strategic acquisition has been formulated and is depicted in Figure 1.[7] This is also the case for Turkey which is planning to achieve almost complete self-reliance, in accordance with its desire to increase its political influence in the region and worldwide. In 2002, Turkey's domestic industry supplied about 24 percent of its defense acquisitions while in 2017 it supplied about 64 percent.[8] The President of Turkey and its senior officials have recently even declared their intention to totally eliminate their dependence on foreign military systems and sub-systems.[9]

5 Shaul Chorev and Nir Zarhi, 2019. *Examination of the Necessity for a Private Shipyards Industry for the Development, Building and Maintenance of Military Vessels from a National Perspective: The Case of Israel Shipyards*. Commissioned by the Israel Shipyards Company. Maritime Policy and Strategy Research Center (July, 2016). [Hebrew]; Timothy D. Hoyt, 2007. *Military Industry and Regional Defense Policy: India, Iraq, and Israel*. New York: Routledge.

6 Association of Southeast Asian Nations (Indonesia, Malaysia, Philippines, Singapore, Cambodia, Lao, Myanmar, Viet Nam, Thailand and Brunei Darussalam).

7 Richard A. Bitzinger, 2004. Offsets and Defense Industrialization in Indonesia and Singapore. In J. Brauer, & J. P. Dunne, *Arms trade and economic development: Theory, policy, and cases in arms trade offsets* (pp. 255–270). New York: Routledge.

8 Paul Iddon, 2019. Turkey's Ever-growing Indigenous Arms Industry. *The New Arab* (18.10.2019): https://www.alaraby.co.uk/english/indepth/2019/10/18/turkeys-ever-growing-indigenous-arms-industry

9 Burak Ege Bekdil, 2017; Paul Iddon, 2019.

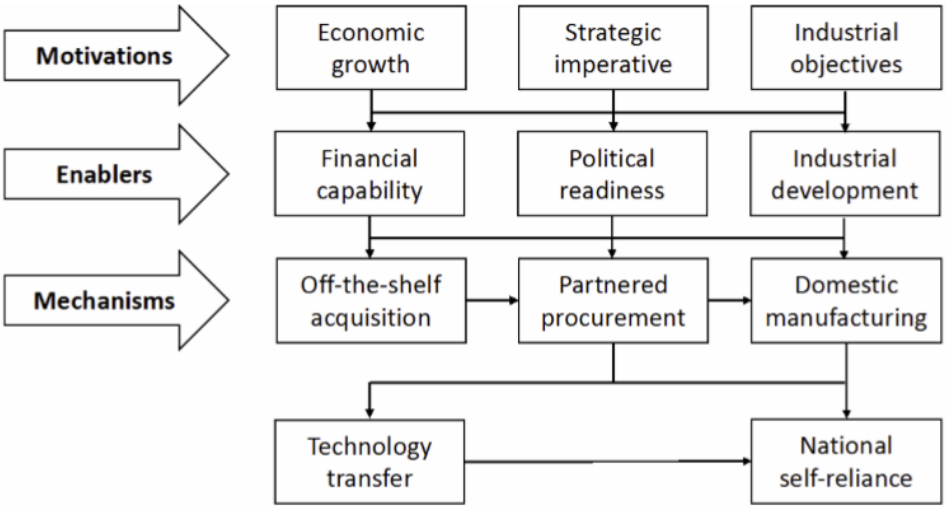

Figure 1 – Strategic acquisition model of the ASEAN countries

The Israeli case

The navy. The navy's role is to operate in the sea and from the sea in order to protect the State of Israel, its sovereignty and the security of its citizens, to protect Israel's national interests and also to be part of the effort to deter the enemy and prevent them from achieving its goals. The navy includes a number of operational units, including a squadron of missile boats, a fleet of submarines, the naval commando unit, patrol units, etc., as well the naval headquarters, the support units (including the naval shipyard) and the various naval bases.[10]

From the beginning of the 2000s until recently, the size of the navy remained basically unchanged. Nonetheless, in recent years, there has been a trend of renewal in the navy, which is expected to continue in the coming decade. The future vessels are characterized by greater displacement than the existing ones (which will almost double the total displacement of the navy). At the same time, there is an increase in the scale and diversity of the main systems operated and maintained by the navy and in particular the addition of fire control and weapons systems. Nevertheless, it is unclear whether this process of expansion and renewal is being carried out as part of a defined national strategy, which includes a component of long-term government investment which has as its goal collaboration with domestic industry.

10 Chorev and Zarhi, 2019.

Shipyard infrastructure. A method for classifying a state's navy and the capability of its domestic shipbuilding industry and the correlation between them is described in Todd and Lindberg (1996).[11] Accordingly, the Israeli navy is defined as a regional naval power. This category requires a shipbuilding industry that is characterized by complete or almost complete independence in the ability to plan, engineer and produce large surface vessels and partial to full capability with respect to submarines. In practice, there is partial suitability in the capabilities of the shipbuilding industry in Israel, which is currently limited to surface vessels only and which relies on Israel Shipyards.

The naval shipyard. The maintenance of ships is carried out at the naval shipyards, which is the technical-engineering body responsible for maintaining the ships and their systems and upgrading when necessary, according to a policy of "preventative maintenance". In wartime, the naval shipyard focuses on increasing the fleet's readiness – bringing the ships to full readiness and carrying out urgent repairs.[12] Some of the navy's maintenance needs, whether in peacetime or in wartime, are provided by external contractors, with the goal of regulating the workload, dealing with infrastructure constraints, and supplementing the professional abilities that are not available at the shipyard and in particular a lack of expertise, experience and infrastructure for the development and production of ships, ship components and various systems. In view of the expected expansion of the navy, it is not unlikely that it will seek to outsource some of the maintenance of ships to external contractors, particularly since it is the only player that can meet the maintenance needs of its submarines and systems.[13]

Private shipyards. From a historical viewpoint, it is important to mention that the need for a civilian private shipyard in Israel—as an essential infrastructure of the State for the building of military surface vessels for the Israeli navy and the use of the shipyard's essential infrastructures—has been discussed off and on and with varying intensity from the establishment of Israel Shipyards as a government company in the 60' until

11 Daniel Todd & Michael Lindberg, 1996. Navies and shipbuilding industries. Westport, CT: Praeger Publishers.

12 In such a situation, manpower, resources and infrastructures will be distributed among the various geographic sites in order to meet operational needs and to increase survivability. This situation is liable to have implications for the availability and efficiency of the response.

13 Chorev and Zarhi, 2019.

today, when it is already a private company.[14] During this period, the discussion has taken on different forms, with the connection between the shipyard and the defense sector becoming much stronger, starting from the beginning of 1970 and from the mid-1980s.[15] This connection weakened to the point that the Israel Shipyards were privatized in the mid-1990s. Although the navy continued to purchase ships from time to time from Israel Shipyards, it was no longer the main producer of Israeli missile boats. In 2002, Israel Shipyards delivered a Saar 4.5 ship to the navy but since then no missile boats have been ordered from Israel Shipyards. In 2015, and in processes that are currently being examined (and which we have no intention or desire of discussing in this article), the Israeli defense sector decided to sign a contract worth NIS 1.8 billion with German shipyards for the construction of four defensive ships based on the Braunschweig-class corvette.[16] Recently, the Ministry of Defense signed a contract with Israel Shipyards to plan the next generation of missile boats, which will replace the old Saar 4.5 Nirit. The planning will take a year and the agreement is likely to develop into a deal of more than one billion dollars, which will include large-scale acquisition

14 A similar case is that of the Beit Shemesh Engines company which was created in the late 1960s under the joint ownership of Yosef Shidlovski and the State, with the goal of producing engine parts. Later on, it became a government company and today it is a public company under private ownership. Over the years, the company has been the main supplier of engine parts to the IAF, including the development of the Lavi engine and also weaponry such as the Delilah missile. In recent years, the company has experienced huge growth in its framework contracts for the supply of jet engine parts to the civilian market, which amounted to $1.3 billion in the third quarter of 2018 (where the company's customers include engine producers such as Pratt and Whitney and parts producers such as MTU and ITP). The company has capabilities in the production of complex and technology-intensive parts by means of interactive manufacturing that involves molding and machining. These capabilities make the company a world leader in the field. Over the years, the company has employed hundreds of workers in the periphery and it is active in promoting technological education. Recently, the company inaugurated a state-of-the-art training center for the machining of metal for the aircraft industry, which was established together with the Ministry of Labor and Welfare and is operated within the Beit Shemesh factory in cooperation with the Atid network of technological colleges. Etti Swissa Ben Ami, 2018. Vocational Training is Initiated at the Beit Shemesh Engines Factory. *Ethika* (June 3, 2018). [Hebrew]; Boris Schneider, 2019. Warming up the Engines: Beit Shemesh Presents one of the Most Successful Growth Stories in Israel. *TheMarker* (March 17, 2019). [Hebrew]; Wikipedia, 2019. Beit Shemesh Engines: https://he.wikipedia.org/wiki/%D7%9E%D7%A0%D7%95%D7%A2%D7%99_%D7%91%D7%99%D7%AA_%D7%A9%D7%9E%D7%A9 [Hebrew]; Beit Shemesh Engines, 2015. *Presentation of the Company for 2015*. Beit Shemesh Engines Holdings Ltd. [Hebrew].

15 During this period, the Israel Aircraft Industry—with the blessing of the navy—became involved in the construction of small ships at the RAMTA factory in Beer Sheva.

16 The German government is meant to pay for about one-third of the cost of the deal.

of radar, missiles and electronic fire and control systems from the domestic defense industry.[17]

With respect to the export of military systems, weapons system developed by the defense industries have been proven on the battlefield ('Combat Proven') and this has opened up export markets around the world and has produced revenues for the State.[18] This capital has also been of use in the development of the next generation of systems for the IDF. In this case, Israel Shipyards has also exported its flagship brands – a patrol boat based on the Saar 4 and Shaldag-class patrol boats – to other countries, while enabling other defense manufacturers, such as the IAI, Rafael and Elbit to sell the systems, which were installed on Israeli ships, and in particular weapons systems, detection systems and control systems. At the same time, during the past decade the acquisition of the main platforms by the navy – missile boats and submarines – has been from abroad and financed from foreign aid. In this situation, it almost impossible to export, whether due to the choice of the navy not to rely on products developed and produced by the defense industries or because the products developed have not been combat proven or due to the prohibition on exporting systems whose development is financed from US aid.[19]

The need for a private civilian shipyard in Israel: policy recommendations. A comprehensive study by Chorev and Zarhi (2019)[20] was recently carried out at the request of Israel Shipyards. The study examined the need for a private civilian shipyard in Israel as an essential infrastructure of the State for the building of surface vessels for the Israeli navy and for the use of the shipyard's essential infrastructure, with a horizon of more than one decade. The study included a comprehensive theoretical survey, an examination of case studies in Israel and abroad and also an analysis and comparison

17 Udi Ezion, 2019. Learning the Lessons from Case 3000? The Navy's New Missile Boats will be built in Israel. *Calcalist* (November 6, 2019). [Hebrew]

18 In many cases, the process of marketing and participating in new projects abroad required that the product or technology be 'combat proven'.

19 In September 2016, a new aid agreement was signed between the US and Israel. According to the agreement, Israel will no longer be able to convert part of the annual assistance budget from dollars into shekels, which would allow it to make purchases from Israeli companies, and the segment for conversion will gradually decline over the duration of the agreement (Ministry of the Economy and Industry, 2018).

20 Shaul Chorev and Nir Zarhi, 2019. *Examination of the Necessity for a Private Shipyards Industry for the Development, Building and Maintenance of Military Vessels from a National Perspective: The Case of Israel Shipyards*. Commissioned by the Israel Shipyards Company. Maritime Policy and Strategy Research Center (July, 2016). [Hebrew].

of alternatives, with the goal of evaluating the possible implications of a wide variety of situations and scenarios.[21] The main recommendations are presented in what follows:

First, it is recommended that a strategy of self-reliance be formulated in the domain of military shipbuilding for the State of Israel. This will contribute to Israel's national resilience in defense, the economy, industry, technology, education and social welfare. Accordingly, it is proposed that the Ministry of Defense, in collaboration with the navy, decide on policy guidelines that will shape and develop the military shipbuilding and ship maintenance sector, which will include the definition of areas of responsibility of the various players and the relations between them, including the Ministry of Defense, the IDF (and the navy in particular) and industry – in periods of both peace and war.

It is also recommended that the government reinforce the military shipyard, i.e. the navy shipyard, which is responsibility for the operational readiness of the navy's vessels, and in particular their maintenance and upgrading, and the private shipyard, which is responsible for ensuring the ability to develop and produce ships, ship components and maritime systems according to the needs of the navy and the civilian market (such as the emerging energy market), as well as providing shipyard services and repairs. In view of the police investigation of various players who allegedly attempted to bring about a decision that the maintenance of the submarines would be carried out by the German shipyards rather than by the navy shipyard, it is suggested that this recommendation be carried out through direct dialog with the relevant officials in the Acquisition Authority of the Ministry of Defense and of the navy.[22]

In this context, it is proposed that the State will be in charge of promoting this sector using two main policy tools. First and foremost, it needs to develop and build military vessels and systems for the navy at the local shipyards (along with encouraging the use of systems and weapons developed and produced by local industry). This will require a mechanism to ensure competitive prices while maintaining quality. It is important to mention that this policy tool has an additional and essential role, namely the encouragement of exports. The second policy tool is to introduce a component of local value (Offset) in international contracts (G2G) between Israel and foreign contractors and primarily in the maritime domain.

21 The alternatives chosen are based on the existing situation and create variations that are within the reasonable realm of possibilities in the short and intermediate terms (up to 2035): Alternative 1 – Maintenance of the naval shipyard alongside a privately-owned shipyard without State involvement (current situation); Alternative 2 – Maintenance of the naval shipyard alongside a privately owned shipyard with government involvement; and Alternative 3 – Maintenance of only the naval shipyard in its current format and reliance on acquisition from abroad.

22 The efforts to reduce the scope of the navy in the maintenance of the Dolphin submarines is one of the issues that has been investigated by the police in the framework of Case 3000.

In addition, it is recommended that the proposed policy be long-term and that it rely on long-term planning, and in particular the development and building of vessels. This will create the stability that is necessary for investment by industry in the development of infrastructure and technology, in the training of skilled manpower and in the creation of a technological manpower reserve. In this context, consideration can be given to linking government encouragement and the allocation of part of the industry's profits—particularly profits from exports—to working capital to be used in the development of infrastructure, technology and training.

It is also recommended in this context that a policy be defined which provides a response to the navy's maintenance needs from industry. These will include, among other things, readiness and compatibility of infrastructures.[23] It is proposed that in peacetime, industry should constitute a flexible component in the regulation of the workload in the navy shipyard. In wartime, industry will constitute a strategic home front – a component that provides redundancy. With respect to the specific case of Israel Shipyards, it is recommended that consideration be given to its close proximity to a naval base and the navy shipyard. This provides it with an operational advantage on the one hand but on the other hand elevates overall vulnerability.

In the context of viewing industry as a "dormant" strategic capability for wartime, it is proposed that consideration be given to the approach of 'Surge Capability', a security doctrine that determines the necessary infrastructures for wartime and which is based on a minimal budgeting in peacetime of civilian technology, development and production infrastructures, which make it possible to meet the needs that arise in wartime, in parallel to the injection of agreed-upon budgets in peacetime.

Finally, the study recommends consideration of the possibility of developing Haifa as a national maritime hub. It appears that all of the necessary infrastructures already exist today – ports, a naval base, maritime industry (including Israel Shipyards), defense industries, maritime commerce and service companies, institutions of higher education and research (including Haifa University, which is known for its expertise in the maritime domain), the Technion, Israel Oceanographic and Limnological Research (IOLR), etc. Combining their efforts will constitute a lever for the economic development of Haifa and the North, the creation of a national center of knowledge and expertise and the promotion and development of technologies and products in this domain.[24]

23 The Ministry of Defense has recently invested in modifying the Sincrolift lift system that was built by Israel Shipyards for the navy.

24 A similar decision was passed by the Government of Israel in 2013 with regard to making Beer Sheva into a cyber capital.

Review of the Israeli Government's Decision on Foreign Direct Investment screening against the background of China's Belt and Road Initiative

Ehud Gonen

Introduction

On the 30th of October, 2019, the Ministerial Committee for National Security (the "Security Cabinet") passed decision 372/b on: "Determining a process and mechanism to examine national security aspects of foreign direct investment"[1] (for the full version, see Appendix 1).

The decision to create a committee to examine foreign direct investments is based on similar committees in a number of Western countries in the OECD, including Germany, Britain, Australia and the US,[2] although it is in contrast to the economic policy followed by the Israeli Ministry of Finance since the 1990s (the launch of the program to open the Israeli economy), which is characterized by openness to international trade and foreign investment.

As part of this long-run open-economy policy, the State of Israel actively encourages foreign investment in Israel by signing international agreements in the areas of protecting of foreign investment and avoiding double taxation and also through the active marketing of the Israeli economy by means of a network of economic missions and the Foreign Investment Authority, both of which are part of the Ministry of the Economy and Industry.

Based on the coincidental timing, interviews in the media and the analysis by commentators,[3] it appears that the Cabinet's decision to create a committee to examine

1 Decision 372/b of the Ministerial Committee for National Security (the Security Cabinet) dated October 30, 2019, Prime Minister's Office site, https://www.gov.il/he/departments/policies/dec372_2019. [Hebrew]

2 "A Regulatory Mechanism to Oversee Foreign Investment in Israel: Security Ramifications", Doron Ella, in: Israel-China Relations: Opportunities and Challenges, eds: Assaf Orion and Galia Lavi, Institute for National Security Studies.

3 See, for example: (1) "Under pressure from the US which is concerned about China: The Cabinet creates the Committee for Approval of Foreign Investment", Itamar Eichner, ynet, https://www.ynet.co.il/articles/0,7340,L-5616376,00.html. (2) "Netanyahu wants to notify Trump of the creation of a committee to limit Chinese investment", Hafai Amir, The Marker, https://www.themarker.com/news/politics/.premium-1.6995523. (3) "Under US pressure, the Cabinet decides to monitor foreign investments from China", Barak Ravid, Channel 13 news, October 30, 2019, https://13news.co.il/item/news/politics/state-policy/china-investments-922093. [Hebrew]

foreign investment is related to the awarding of the tender for the operation of the Hamifratz Port (located in Haifa) to SIPG, a Chinese company, which appears to be in line with the policy of Chinese companies to invest in infrastructure around the world, as part of the Belt and Road Initiative (BRI). Additionally, the US administration has expressed its dissatisfaction with the awarding of the tender to Chinas company which is perceived as part of China's strategic expansion into the Middle East in domains that are important to national security in general and the pro-American Israeli economy in particular.

A reading of the Cabinet decision reveals an attempt to balance between Israel's economic needs as a small economy and the economic openness that is dependent on international trade and foreign investment, on the one hand, and national security needs and Israel's position in the "larger game" being played by the superpowers, whose goal is regional and global hegemony, on the other hand.

This chapter will review the Chinese and American policies and the opening of the ports in Israel and will also analyze the government decision in light of these factors.

What is foreign investment?

Foreign Direct Investment (FDI) occurs when an investor from the source country acquires an asset in the destination country and also becomes an active partner in its management (which gives the investor voting rights on the board of directors and the right to participate in the management of the company), as opposed to an investment portfolio (or financial investment) in which the investor has no control over the management of the asset.[4]

In the domain of infrastructure construction, a differentiation should be made between work carried out under contract, which is essentially the export of construction services, and the aforementioned acquisition of certain rights over an asset, which is defined as an investment.

According to these international standards, the construction of the Carmel Bridge (partly by CCECC, a Chinese company) and the construction of the Hadarom Port in Ashdod (by the China Harbor Company) are examples of the export of construction services from China to Israel, but are not Chinese investments in Israel, since, after completing the construction, ownership of the infrastructure is that of the State of Israel and the construction company will not have any ownership or influence on the operations of that infrastructure.

4 UNCTAD, G. (2016). World Investment Report–Investor Nationality: Policy Challenges. Geneva: UNCTAD.

In contrast to the aforementioned export of services, the concession awarded to the SIPG company to operate the Hamifratz Port (see below), the acquisition of the power plant in Allon Hatabor Galil by the MRC company (partly Chinese-owned) and the many investments by Chinese venture capital companies in Israeli start-ups are Chinese investments in Israel, since the Chinese companies are investing capital and in exchange gain ownership and influence over the management of the asset in Israel.

Background – Development of the ports in Israel since 2005[5]

Construction of the ports

In 2005, the government presented a plan for comprehensive reform of the ports in Israel.[6] Its main components included competition between the ports by separating their infrastructures and operations and their incorporation as separate companies. The ownership of the land and the responsibility for the development of physical infrastructure were transferred to the Israel Ports Company (IPC), according to the Landlord model. The IPC is a fully government-owned company created within the Shipping and Ports Authority (SPA).

Following a long planning and statutory stage, tenders for the construction of two new ports were issued and in 2014 construction began. The Ashtrom-Shafir consortium from Israel is building the Hamifratz Port in Haifa and the Pan Mediterranean Engineering Company Ltd., a subsidiary of the China Harbor Company (CCC), a Chinese company, is building the Hadarom Port in Ashdod. It should be recalled that according to the landlord model, the construction of the ports is fully financed by the State in the amount of about NIS 7.3 billion,[7] and the port infrastructure (the land) will belong to the State of Israel following construction. The construction of the ports is meant to be completed in 2021.

Operation of the ports

At the beginning of 2015, following a screening process, four international companies[8] were invited to submit their proposals for operating the new ports: TIL, a Dutch company

5 For a full survey of the development of the ports, see: "Geostrategic aspects of the operation of the Chinese port in Haifa", Ehud Gonen, Maritime Policy and Strategy Research Center, Haifa University, December 2019. http://hms.haifa.ac.il/images/publications/UDI_GONEN/-____.pdf [Hebrew]

6 See a description of the port reform at the site of the Shipping and Ports Authority. http://asp.mot.gov.il/he/ports/reforma [Hebrew]

7 Site of the Israel Ports Company: Plan for the Future Ports – the Hamifratz Port and the Hadarom Port http://www.israports.org.il/he/PortsDevelop/Pages/default.aspx. [Hebrew]

8 See footnote 4 above.

owned by MSC; the German Eurogate company; ICTSI, a Philippine company; and SIPG – Shanghai International Port (Group) Co., a Chinese company. The Philippine company did not submit a bid; TIL and Eurogate submitted bids only for the operation of the Hadarom Port (in Ashdod) and the SIPG company submitted the only bid for operating the Hamifratz Port in Haifa.

According to the model, the operating company receives the port area without any infrastructure and invests its own money in the construction of the systems needed to operate the port. These systems mainly include cranes and the communication and operating systems associated with them, mechanical heavy equipment, storage facilities, internal roads, security, firefighting, etc. The port operation contracts last for 25 years and they also specify the royalties that the operator is to pay to the State. In other words, the winner of the tender invests his own money in the port's equipment, operates it and enjoys the profits for 25 years; in exchange it pays royalties to the State and also taxes like any company in Israel.

Table 1: Summary of construction, ownership and operations of the Mediterranean ports expected to be operation in Israel in 2021.

Name of the port	Land Management	Construction	Operation	Final ownership of the operating company
Port of Haifa	IPC	Ports Authority (historically)	Haifa Port Company Ltd.	State of Israel, discussion of partial privatization and introduction of a strategic partner.
Hamifratz Port	IPC, in an operating tender	Ashtrom-Shafir	SIPG BAYPORT TERMINAL CO	The government of the Shanghai region in China by means of a subsidiary in Singapore.
Port of Ashdod	IPC	Ports Authority (historically)	Ashdod Port Company Ltd.	State of Israel; a strategic partner may be brought in.
Hadarom Port	IPC, in an operating tender	CCC-PMEC	TIL	The MSC company which is a private company with its management in Switzerland by means of a Dutch company.
Israel Shipyards Port	IPC, leased.	Israel Shipyards	Israel Shipyards Port Company Ltd.	A private company owned by a number of Israeli groups and businessmen, some of which are traded on the stock exchange.[9]

9 See Gold Band Group Ltd., Annual Report for 2018, March 28, 2019, Tel Aviv Stock Exchange.

Table 2: Length of waterline in Israel's ports[10]

Name of the port	General length of piers	Percentage of total pier length
Port of Haifa	5,325	35%
Hamifratz Port	1,300	9%
Port of Ashdod	5,836	38%
Hadarom Port	1,960	13%
Israel Shipyards Port	800	5%
Total	15,221	100%

The expansion of China and the Belt and Road Initiative

Starting from 2003, the restrictions on taking currency out of China were partly lifted by the Chinese government, which paved the way for direct foreign investment by Chinese companies outside of China. Thus, a wave of foreign investment by Chinese companies began to sweep the world from that point onward and was directed toward various economic sectors and a large number of countries. In 2013, President Xi Jinping of China declared the Belt and Road Initiative (BRI). It is a diplomatic, economic and financial envelope for investment going out of China, which began, as mentioned, a decade earlier. This envelope emphasizes Eurasia and East Africa and focuses on infrastructures (railways, energy facilities, airports and seaports, highways, etc.).

The initiative includes a land component – the Silk Road Economic Belt (SREB) – and a maritime component – the 21st Century Maritime Silk Road (21CMSR). The declared goal of the initiative is to synchronize development efforts and to promote joint activity among the member countries. This is accomplished by the construction of joint logistic infrastructure, such as ports, railways, oil and gas pipelines, etc. together with the countries who are partners in the initiative.[11]

Since the declaration, the BRI has become one of the pillars of Chinese foreign policy and is actively promoted by the Chinese leadership. The Silk Road brand has been expanded in recent years from its original meaning as a physical route between Asia and Europe. Whether the additions were officially announced, such as the Maritime Silk Road to the Pole or only appeared in the press, such as the Digital Silk Road and

10 The data in the table are calculated based on several sources and there may be small deviations according to the definition and usage of piers in the various ports. Only the calculation of pier length does not take into account other information, such as depth of water at each pier (which determines the size of ships that the pier can serve) and equipment (such as cranes and automatic facilities) at the pier.

11 The State Council, the People's Republic of China 2015. Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road. http://en.ndrc.gov.cn/newsrelease/201503/t20150330_669367.html

the Space Silk Road,[12] this term now encompasses most of the Chinese investment activity worldwide.

Why is there concern about Chinese investment?

Chinese foreign investment, and primarily that under the rubric of the BRI, is attracting a great deal of attention, both in the destination countries and in international political bodies, and for the following reasons: (1) The **domains** in which the investments are made are perceived as strategic from a national perspective, including energy infrastructure, transportation facilities, etc. (2) The large **scope** of the investments: The cumulative total of Chinese investments and commitment to invest, as part of the BRI alone, is estimated to be between $2 trillion and $4 trillion, as of 2018.[13] (3) **Execution**: A large part of the Chinese investments in infrastructure are carried out by Chinese state-owned enterprises (SOEs).[14] (4) **Financing** of the investments is, for the most part, provided by government banks in China, which are called "policy banks", i.e. banks that provide financing for the implementation of Chinese government policy, where the economic feasibility of the project and/or the repayment ability of the borrower are considered to be secondary factors relative to whether the project furthers government policy.[15]

It appears that the combination of the aforementioned factors has raised concern among countries that this is more than an economic program and essentially involves the acquisition of political leverage over the destination countries, which is accomplished by acquiring strategic assets though foreign investment from China. This concern has led to a reaction in many countries. An example is the declaration of Jean-Claude Juncker, the President of the European Commission, that Europe should make it more difficult for the Chinese to make acquisitions in its territory.[16] Another example is the decision of the Australian government in 2008 to add the factor of government ownership as

12 See, for example: China developing 'Space Silk Road' as moon landing marks new era of expansion, *The Telegraph*, 5.1.2019; China talks of building a "digital Silk Road", *The Economist*, 31.5.2018

13 Hillman, Jonathan E. 2018. "How Big is China's Belt and Road?" Center for Strategic and International Studies (CSIS), https://www.csis.org/analysis/how-big-chinas-belt-and-road

14 Ramasamy, Bala, Matthew Yeung, and Sylvie Laforet. 2012. "China's Outward Foreign Direct Investment: Location Choice and Firm Ownership." *Journal of World Business* 47 (1): 17-25.

15 Kolstad, Ivar and Arne Wiig. 2012. "What Determines Chinese Outward FDI?" *Journal of World Business* 47(1): 26-34.

16 European Commission – Press Release 14.9.2017.

one of the parameters considered by the Foreign Investment Review Board (FIRB)[17] which approves foreign investment in Australia. This was in reaction to aggressive Chinese investments on the continent. It should be mentioned that the ownership of foreign investment (i.e. the source country of the investment) is a parameter in the consideration of foreign investments screening boards in other Western countries (the US, Germany, etc.), which was so even prior to the declaration of the BRI by China in 2013.[18]

It should also be mentioned that the influence of multinational corporations on government policy in the destination countries has been known about for many years and there is a vast academic literature on the subject.[19] Nonetheless, it is worth emphasizing again that the characteristics of the foreign investment leaving China are unique (as described in the four paragraphs above).

The US stance toward China and toward the operation of the Port of Haifa

The general US stance toward China was summarized in the words of Dan Coats during his tenure as Director of National Intelligence in a report to the Senate Intelligence Committee in 2019, according to which China (and Russia) are the largest national security challenge to the US.[20]

In August 2018, when construction work on the Hamifratz Port was at its height and about three years after the awarding of the operating tender to the SIPG company, reports started appearing in the Israeli media of a possible conflict between Israel and the US and specifically surrounding the activity of the Sixth Fleet in the Port of Haifa, in view of the fact that the Hamifratz Port will be operated by a Chinese government company.[21]

17 Wilson, Jeffrey D. 2011. "Resource Nationalism or Resource Liberalism? Explaining Australia's Approach to Chinese Investment in its Minerals Sector." *Australian Journal of International Affairs* 65 (3): 283-304.

18 "A comparison of the regulation of foreign investment and acquisitions in Israel and worldwide – China as a case study", Doron Ella, in: Israel-China Relations: Opportunities and Challenges, eds: Assaf Orion and Galia Lavi, Institute for National Security Studies.

19 See, for example, the following well-known book: Frieden, J. A., & Lake, D. A. (2002). *International political economy: perspectives on global power and wealth*. Routledge.

20 Statement for the Record: Worldwide Threat Assessment of the US Intelligence Community, January 29, 2019.

21 See, for example, "A Chinese port in Haifa – a strategic and security risk", The Marker, September 26, 2018. [Hebrew]

The media attention apparently began after the statement by Admiral (ret.) Gary Roughead, the former Chief of Naval Operations in the US Navy, that was part of a joint research study carried out by the Hudson Institute in the US and the Maritime Policy and Strategy Research Center at Haifa University. He stated that in view of the operation of the Hamifratz Port by a Chinese company, he would recommend not designating it as a home port for ships of the Sixth Fleet. This does not involve a termination of visits by American ships to the port but a limit on the scope of cooperation.

> Israel is working itself out of such cooperation because of the Chinese significant presence and role in Israel's ports and the infrastructure that will be in place there. If asked whether the U.S. should forward deploy U.S. Navy ships in Haifa port, which will be operated by the Chinese, I would recommend against that. The Chinese port operators will be able to monitor closely U.S. ship movements, be aware of maintenance activity and could have access to equipment moving to and from repair sites and interact freely with our crews over protracted periods. Significantly, the information systems and new infrastructure integral to the ports and the likelihood of information and electronic surveillance systems jeopardize U.S. information and cyber security. These factors might not preclude brief port visits, but it would preclude homeporting and other protracted projects and initiatives.
>
> *Admiral (ret.) Gary Roughead, former U.S. Chief of Naval Operations*[22]

The statement spread to the global media and several conservative medium in the US printed articles criticizing Israel for contracting with a Chinese company.[23,24] According to reports in the Israeli media, the issue of the Hamifratz Port came up in talks between Prime Minister Netanyahu and the National Security Advisor John Bolton in January 2019.[25]

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22 "The Eastern Mediterranean in the New Era of Major-Power Competition: Prospects for U.S.-Israeli Cooperation"; Hudson Institute, September 2019, Washington, D.C.

23 "Israel is being a bad ally to the US over China", Washington Examiner, Tom Rogan, December 17, 2018 https://www.washingtonexaminer.com/opinion/israel-is-being-a-bad-ally-to-the-us-over-china

24 "Israel's Dangerous Dalliance with China", *Wall Street Journal*, 13 January 2019. https://www.wsj.com/articles/israels-dangerous-dalliance-with-china-11547411591

25 "Trump's National Security Advisor warned Netanyahu about the purchase of Chinese technology. The American Administration does not want to be faced with obstacles when it comes to sharing sensitive information with Israel. One of the main concerns relates to the Chinese investment in the Port of Haifa." Reuters – article in the Marker, January 10, 2019. https://www.themarker.com/wallstreet/1.6827328 [Hebrew]

Trade relations and investment between Israel and China

Opening of the Israeli economy

The State of Israel is included in a small group of developed countries that includes Singapore, Ireland, Holland, the Baltic states, and others. The main economic trait that characterizes this group is the openness of their economies which is reflected in a high level of international trade and foreign investment relative to GDP,[26] alongside being relatively small economies (in international terms).

In 2018, Israel's foreign investment (both incoming and outgoing) stood at about 7 percent of GDP, with incoming foreign investment totaling about $22 billion (5.5 percent of GDP) and outgoing investment totaling about $6 billon (1.5 percent of GDP). The rate of incoming investment within GDP is considered to be high relative to other countries and it is characteristic of small developed countries, as mentioned above.

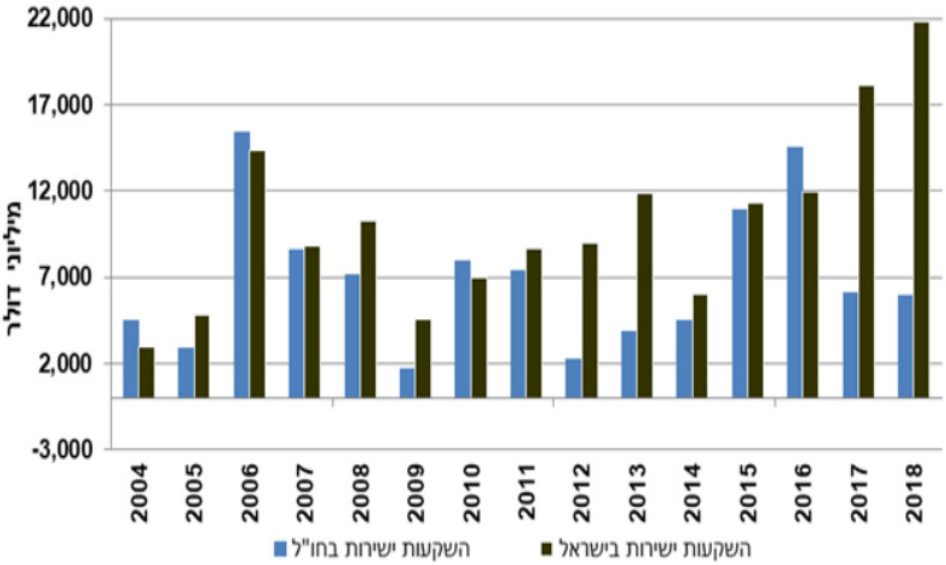

Figure 1: The flow of direct foreign investment to and from the Israeli economy by year (2004-2018)[27] (discontinuities in specific years [such as 2006] usually reflect an exceptionally large single transaction)

26 There is a close relationship that has been proven by research in recent decades between incoming foreign investment and international trade (primarily exports), but this phenomenon is beyond the scope of this chapter.

27 From "Summary of Israel's balance of payments in 2018", Central Bureau of Statistics, March 10, 2019. https://www.cbs.gov.il/he/mediarelease/DocLib/2019/078/09_19_078b.pdf

The openness of the Israeli economy can also be seen in trade, with exports constituting about 29 percent of GDP ($114 billion), with Israel's total foreign trade constituting about two-thirds of GDP.

It can be stated unambiguously that the openness of the Israeli economy, which began with the 1991 declaration of a liberal import policy (which essentially exposed the Israeli economy to the globalizations process),[28] together with other factors (such as immigration from the Soviet Union, the commercialization of military technologies, etc.) created unprecedented growth for Israel during recent decades.

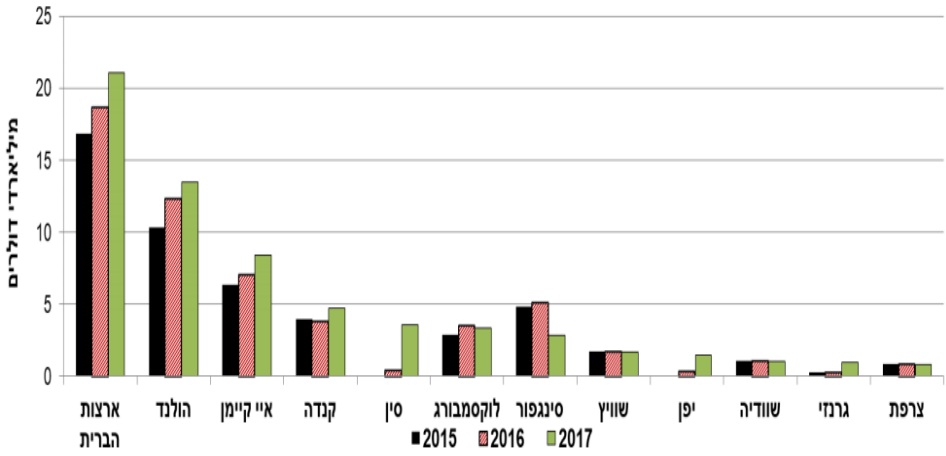

Figure 2: The cumulative total of foreign investment in Israel according to source country

It is beyond the scope of this article to describe the economic and trade relations between Israel and China. We will focus on trade issues (and primarily Israeli exports to China) and direct foreign investment (and primarily Chinese investment in Israel).

China is one of Israel's main trading partners and also constitutes a major source of investment in Israeli technology companies (there are those who claim that China is the source for one-quarter of the large investments in the Israeli hi-tech sector).[29] Figures on the breakdown of incoming direct foreign investment in Israel have been published by the Central Bureau of Statistics only to 2017. The data indicate that cumulatively until

28 For further details on the import exposure policy, see https://taxes.gov.il/About/SpokesmanAnnouncements/Pages/Hodaot1997to2004/hasifa.htm.

29 "Shanghai is here: Chinese investors are increasing their presence in Israeli hi-tech", Yasmin Yablonko, Globes, October 30, 2018, https://www.cbs.gov.il/he/mediarelease/DocLib/2019/078/09_19_078b.pdf. [Hebrew]

2017,[30] China is Israel's third largest source of investment, after the US and Canada (ignoring tax havens and intermediate countries, i.e. the Cayman Islands and Holland).

It should be mentioned that the Cayman Islands are a well-known tax haven and investments from that country actually originate from other unknown countries who enjoy business anonymity there. This is also true to some extent for Holland. Holland is not of course a tax haven and the business information there is made public; however, due to a favorable tax treaty with Israel many of the transactions between Israeli and European countries are carried out by way of Holland and also in this case investments from Holland are actually from other countries (apparently European ones).

In the area of exports, it appears that China is the third largest export destination in the world for Israeli firms (calculated for each European country individually rather than for the entire EU) despite the drop in trade in 2018.

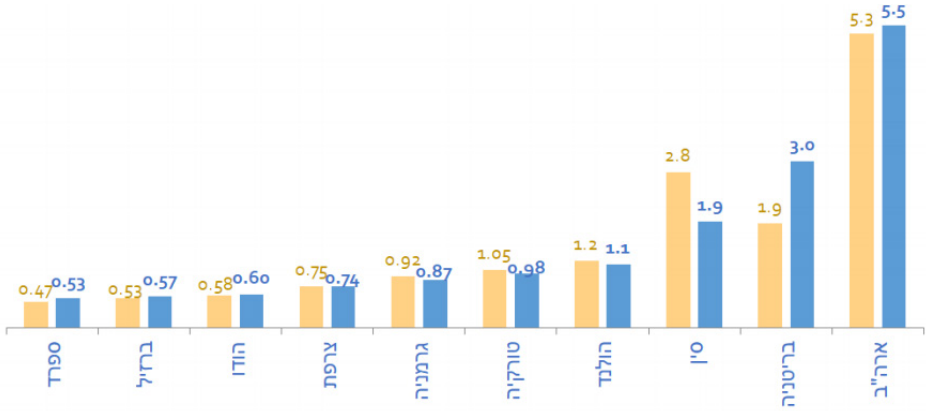

Figure 3: Destinations of Israel's exports (first half of 2019); China in third place after the US and Britain[31] (2018 in yellow and 2019 in blue)

The breakdown of Israeli exports to China by sector is mixed and they include a significant component of chemicals and petroleum products, which have a low added value to the Israeli economy and can be characterized as commodities.

30 "Cumulative" means the sum of investment arriving from these countries together over the years until the time of the report, in view of the fact that direct investment is long term and the significance of investment in any single year is relatively small. More important is the total incoming investment over time.

31 Developments and Trends in Israeli Exports, Summary for the First Half of 2019, Israel Export Institute. https://www.export.gov.il/api//Media/Default/Files/Economy/economy_megamot_1sthalf19.pdf [Hebrew]

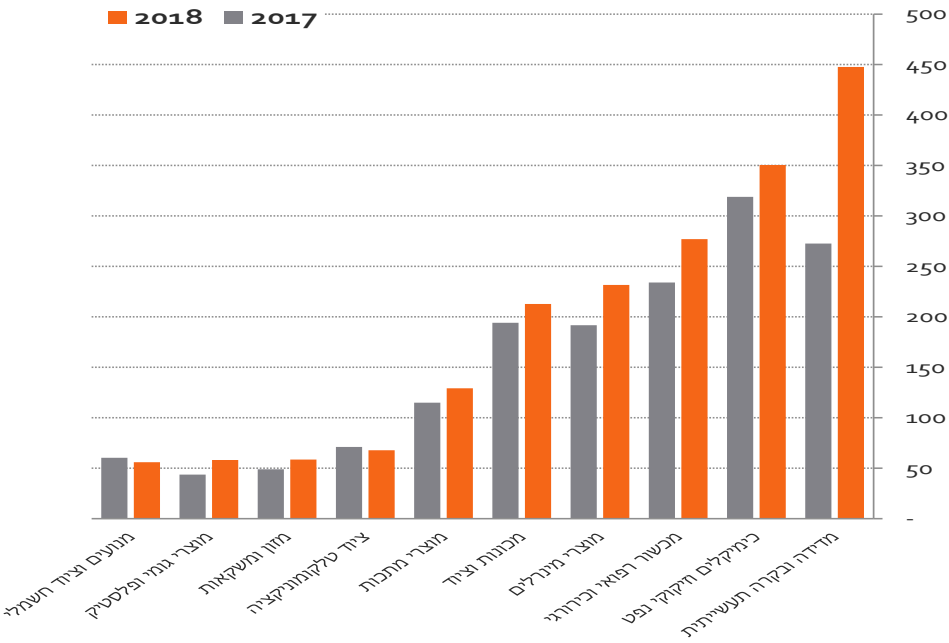

Figure 4: Main sectors exporting to China; high proportion of export in chemicals and petroleum products and in mineral products[32]

Analysis of the decision by the Ministerial Committee for National Security to establish a process and mechanism for examining the national security aspects of foreign investments

In the international political context, China usually adopts a clearly pro-Arab and anti-American stance in the UN and other international arenas. The stance of China with respect to the US is often defined as "nationalist", which is as a rule anti-American.

China (together with Russia) takes an anti-American line, which was demonstrated in December 2019 during the joint naval maneuvers held by China, Russia and Iran in the Gulf of Oman.[33] This stance is generally viewed in the context of its energy dependence on Middle East oil, and primarily from Iran.

32 Developments and Trends in Israeli Exports, Summary Report for 2018 and Forecast for 2019, p. 25, Israel Export Institute. https://www.export.gov.il/api/Media/Default/Files/Economy/megamotsikum2018.pdf [Hebrew]

33 Russia, China, Iran start joint naval drills in Indian Ocean, Reuters, December 27, 2019. https://www.reuters.com/article/us-iran-military-russia-china/russia-china-iran-start-joint-naval-drills-in-indian-ocean-idUSKBN1YV0IB

As mentioned, there are important economic ties between Israel and China. This phenomenon, of course, describes most of the countries in the world, not just Israel. However, as a small and open economy, Israel is more dependent on these relations than countries with a large domestic market.

It would appear that the decision of the Ministerial Committee is an attempt to bridge the gap between Israel's economic needs as a country dependent on international economic activity and with significant economic relations between it and China on the one hand and its political needs arising from its geostrategic situation and its strategic alliance with the US, which is Israel's most important diplomatic asset, on the other hand.

The structure of the committee

Chairing the committee is a representative of the Ministry of Finance. As mentioned, the Ministry of Finance has for the last three decades adhered to a policy of an open economy and encouragement of international trade and foreign investment (with a few exceptions) and therefore this is likely to also reflect the outlook of the committee.

The other members of the committee consist of senior representatives from the Ministry of Finance, the Ministry of Defense and the National Security Council. The status of the representatives of the Foreign Ministry and the Ministry of the Economy and Industry were reduced to observer, i.e. they can express the ministry's opinion, but they have no influence over the voting or the discussion.

The stance of the Foreign Ministry is highly important. This is clear in the case of, for example, Chinese investments since in general the companies are owned by the Chinese government and the rejection of an investment from a Chinese company by Israel has diplomatic implications for relations between the two countries. The reduction in the status of the Ministry of the Economy and Industry is also puzzling, since it maintains, as mentioned, a network of more than 40 economic attaches throughout the world and the Foreign Investment Authority and it is the only ministry with its "finger on the pulse" with respect to the international economic arena and marketing of the Israeli economy to foreign investors.

Furthermore, the Cabinet's decision does not mention the status of representatives of other relevant ministries in each specific discussion. On the issue of the ports, for example, the stance of the Ministry of Transportation, both with respect to the Israeli economy and as the entity that possesses information on the situation and trends of the ports and the international shipping sector, is highly relevant. It would have been

worthwhile to formalize the status of the ministries that are relevant to the investments, and not just as observers who attend at the invitation of the committee chairman.

The goal of the Committee

It would appear that the main goal of the Cabinet's decision is to find a balance between security considerations and economic needs. As it explicitly mentions: "The processes that were decided on will find a reasonable balance between the need to encourage foreign investment in Israel and ensuring continued economic prosperity on the one hand, and national security considerations on the other." In other words, the decision is meant to achieve balanced decisions and not just to maintain national security.

The Cabinet decision states that "the Committee will assist regulators in taking national security considerations into account in the approval of foreign investment…" In other words, the committee is not meant to approve investments but only to provide "assistance in order to take national security considerations into account." This can be interpreted as a committee that makes recommendations to regulators with regard to the inclusion of certain conditions in a contract, the addition of an appendix on natural security considerations to existing contracts, the imposing of restrictions on the country of origin of participants in a tender process, etc. However, as mentioned, the committee does not have the power to approve or reject an investment.

The Committee's powers

The Committee has no regulatory or enforcement powers and, as mentioned, only provides "assistance". The Security Cabinet's decision states that a request for the Committee's involvement will be voluntary. In other words, a government ministry will decide on its own whether to submit a proposed foreign investment within its purview for discussion, regardless of any national security guidelines.

The fact that the government ministry has the power to decide whether to involve the Committee provides the professional ministries with room to maneuver. This situation weakens the status of the Committee to a significant degree, since it may be that major investments which are relevant to national security will not be discussed. Furthermore, this situation makes it difficult to maintain a homogenous economic policy, since it may be that in a particular domain (such as transportation) investments will be discussed by the Committee, while in others (such as agriculture) they are will not. In theory, a situation is possible in which a foreign corporation makes two investments in the Israeli economy that are equal in size and are made simultaneously where one investment is discussed by the Committee and the other is not.

Similarly, providing the relevant ministry with the power to decide whether to involve the Committee is not, in our opinion, consistent with the fact that that government ministry is not even a member of the Committee (not even as an observer, as mentioned). Although it is reasonable to assume that the relevant ministries will be consulted, as stated in the decision: "…the Committee will consult with the relevant national security and economic officials…" and it is reasonable that the "relevant economic officials" also include the professional ministry that is the most closely connected to the investment, it would still be worthwhile in our view that the status of the aforementioned professional ministry be formally defined.

It is difficult to imagine that from a public perspective (rather than a legal or judicial one) the minister responsible for an important national infrastructure would not submit a foreign investment in his domain to the Committee for discussion. Nonetheless, as mentioned, the government decision does not require it and the decision is that of the minister, according to his political position and the balance of power at that time between the various government ministries, the Ministry of Finance and the bureaucracy.

Types of investments

With regard to the types of investments that a government ministry can submit to the Committee for discussion, it was decided that "investments that do not require government approval will not be submitted for discussion." This is an ambiguous formulation by way of negation, since there are few investments in which there is a clear obligation by law for such approval. The obligation of obtaining approval primarily exists in the case of government companies; for example, "determining an essential interest in a government company based on the Government Companies Law.[34]

From here, it is understood that the Committee will not discuss any private investments, an area that is particularly relevant in the case of venture capital and foreign investment in defense technologies and dual-use technologies.[35] Furthermore, the Committee also does not have a mandate to discuss investments in companies or non-governmental organizations (such as municipal entities, non-profit organizations, etc.). In some cases, these are organizations which although they are not connected to the government play an important role in Israel's economy and in Israeli society (such as corporations owned by universities, municipal corporations, agricultural cooperatives [such as in

34 The Government Companies Law, Part 8.2 (Protection of Essential State Interests), paragraph 59h.

35 The issue of defense exports and dual-use exports is regulated according to Israeli law by the Branch for Supervision of Exports in the Ministry of Defense, but foreign investment in companies with products and technologies that are dual-use or related to national security is under far less scrutiny.

the case of Tenuva] and even non-profit organizations such as WIZO, Hadassah and others). (We would emphasize that it is not being claimed that these organizations are candidates for foreign investment, but rather they are presented only as examples of public non-governmental organizations with a large social and economic impact.)

The Cabinet decision defines investments in the following domains as candidates for examination: "…finance, communication, infrastructure, transportation and energy". While it appears that the list includes all of the relevant domains, an examination of investments and investment activity worldwide indicates that there are significant investments also in agriculture, education, academia and even health, domains that are not mentioned in the Cabinet decision.

Specifically, in the case of agriculture, it is worth mentioning the examination by the Ministry of Agriculture with regard to the leasing of about one million dunams of land in the Negev for agricultural use to a foreign country, as evident from Public Tender 69/2018: "To provide strategic consulting services to assess the feasibility of agricultural development for the production of agricultural produce for foreign countries." (In the body of the tender, China is mentioned explicitly.) This potentially huge deal includes the leasing of land for the long term, the construction of desalinization facilities, etc., which is not included within the Committee's mandate.

The decision does not (of course) explicitly mention any specific country to which the decision is addressed.

Conclusion and recommendations

It appears that the operation of the Hamifratz Port by the SIPG company within the domestic context of the Israeli economy on the one hand and the geopolitical context and the superpower competition over regional and global hegemony on the other, have clearly illustrated for Israel's decision makers the national security implications of economic activity, such as foreign investment in national infrastructures.

The Cabinet decision in theory tries to balance between Israel's economic needs as an economy open to trade and foreign investment (and which has benefited greatly from an open economy in recent decades) on the one hand and Israel's unique security needs, its geostrategic position and its close security relationship with the US and the US support of its defense budget, on the other. In the background are the rise of China and the tension between the superpowers.

In theory, and only in theory, this attempt at balance has created—in an environment of political wrangling between the government ministries in Israel—an anemic, toothless

and unenforceable decision, such that submitting an issue to the Committee for discussion is completely voluntary, not to mention that accepting its recommendations is completely optional. Nonetheless, in our opinion, this is an intentional and declarative process that explicitly gives preference to the continuation of an open-economy policy over creating regulatory obstacles to economic activity. This approach is reflected in everything from the structure of the committee and the fact that it is chaired by a representative of the Ministry of Finance to the powers of the committee and the types of investments it can review.

The creation of the mechanism for screening foreign investment is only a symbolic measure, apparently in response to American pressure, but in reality the previous policy is still in place.

The decision to give priority to an open economy over considerations of national security is legitimate and is in line with the approach of Israel's elected leaders. It appears that many other countries have also chosen this position. We mentioned above that the State of Israel is classified as a small and open economy and indeed most of the countries included in this category accept investment from China. These include Ireland, Greece, Singapore and even Israel: the investment in the Allon Hatabor power plant occurred after a vocal public debate over the Chinese investment in the Port of Haifa.

Nonetheless, it is important to mention that Israel's geopolitical situation in the Middle East and its informal alliance with the US are both unique factors not present in other countries. These factors, in addition to the lack of familiarity with China, its culture and its national goals, in our opinion calls for a more cautious policy towards foreign investment in Israel.

Recommendation 1: A mechanism for discussing foreign investment coming in to Israel

In our opinion, the State of Israel should improve the mechanism for reviewing foreign investment coming into Israel, beyond simply what is contained in the decision of the Ministerial Committee for Natural Security approved on October 30th, 2019. This should include the imposition of **obligatory reporting** by the regulator on incoming foreign investment in sectors to be decided on and in amounts more than the threshold also to be decided on. This would be only an obligation to report, not permission to accept an investment. This in contrast to the voluntary reporting mechanism according to the current decision.

The reporting obligation will facilitate the collection of information on foreign activity in Israel and the creation of a full picture that is not dispersed among various regulators.

Similarly, we recommend that secrecy be imposed on the recommendations of the existing committee in order to create an unofficial channel between the regulator and the investing company for discussing the conditions to be placed on the investment. It will also facilitate the regulator's unofficial activity to block undesirable investments (as was in the case of the proposal to buy the Israel Chemicals Company and that to buy a number of large insurance companies in Israel).

In the Israeli context (as a small country dependent on international trade and investment), such an unofficial and non-public mechanism is, in our view, preferable over an official and public screening mechanism for the following reasons:

The decision by an official, formal and public mechanism has major diplomatic implications, since it is an official mechanism of the State which is making a binding declaration that may cause the source country to lose face and to seek retribution. On the other hand, the cancelation or blockage of an investment by unofficial means allows the country to withdraw with honor and provides room to maneuver between commercial interests (the company actually making the investment) and national interests (the source country of the investment).

An official and public mechanism is a clear target for political and diplomatic pressure. Its decisions will be challenged in the courts and the members of the board are exposed to personal, economic and other pressures. On the other hand, a non-public mechanism allows for a certain degree of ambiguity with regard to the identity of the decision makers on the Israeli side.

Recommendation 2: Transparency and openness to the media with respect to foreign investment in Israel's public infrastructure sector

A significant proportion of the concerns with regard to foreign investment (and primarily those from China) that have been described above are the result of differences in culture, values and behavior between the source country and Israel. In order to moderate the polarity in the public discussion and to channel it in the direction of an efficient policy, there is a need for transparency and openness, namely full disclosure to the public of data, contracts and understandings between the Israeli side and the foreign investor. In this context, we call for full public disclosure of the agreement for the operation of the Hamifratz Port between the IPC and SIPG, the operator.

Recommendation 3: A government advisory and research body for the integration of global trends within Israeli policy

If we look at, for example, the operating agreement signed between the IPC and the SIPG company in 2015, it appears to have been signed after the declaration by the President of China of the BRI in 2013. Additionally, there were academic articles published by academia and by research institutes (primarily American ones and in the American military literature) regarding the expansion of Chinese investment in seaports and the geostrategic implications of this policy, even before the initial declaration of the BRI (such as publications of the CSIS research institute[36] and the US Military Academy[37]). The agreement was nonetheless signed, apparently without any protest from the security establishment in Israel.

This example supports the need for a government advisory body that will examine global developments in domains that not necessarily military and their implications for Israel, in order for these research inputs to help the government arrive at correct decisions. Research of this type is currently carried out primarily by the Ministry of Intelligence Affairs and it should also include the insights and vast research produced by research institutes and think tanks in the universities and elsewhere.

Recommendation 4: Educating high-level government officials in Israel on the subject of "soft power"

In view of the trend toward a renewal of superpower conflict and what appears to be the growth of a new multi-polar international order, there is a need to inform senior officials and officeholders in public companies of the international aspects of their activity on the one hand and to promote awareness of "soft power" policies as implemented by the superpowers, on the other.

An education program of this type can be implemented by, for example, the addition of content to courses that already exist for directors and senior officeholders in government companies, courses for senior officials in the Civil Service Commission, etc.

36 Revisiting China's 'String of Pearls' Strategy: Places 'with Chinese Characteristics' and their Security Implications

37 String of Pearls: Meeting the challenge of China's rising power across the Asian littoral/

Appendix 1

Announcement of the Ministerial Committee for National Security (NOT official translation)
Government
The 34th government, Benyamin Netanyahu
Date of publication: October 30, 2019.

At the completion of a long-term process led by the National Security Council, the Ministry of Finance and the National Economic Council, and following a series of discussions, the Security Cabinet decided to create an advisory committee headed by the Ministry of Finance that will examine the national security aspects in the approval of foreign investments.

The Committee will consist of representatives of the Ministry of Finance, the Ministry of Defense and the National Security Council, as well as observers from the Foreign Ministry, the Ministry of the Economy, the National Economic Council and an additional representative from the Ministry of Finance. The Committee will consult with the relevant security and economic experts. Submitting of an investment by a regulator for discussion by the Committee will be voluntary. Investments that do not require government approval will not be brought before the Committee. The preparatory work to establish the Committee and the formulation of its work procedures will be completed within 45 days.

The decided-on processes will appropriately balance between the need to encourage foreign investment in Israel and ensuring continued economic prosperity on the one hand and national security considerations on the other.

The Committee will assist regulators in integrating national security considerations during the process of approving foreign investments in the domains of finance, communication, infrastructure, transportation and energy. Decisions will be made subject to the State of Israel's security commitments, with emphasis on the relevant economic considerations. Israel thus joins many other countries, including the US, Canada, Britain, Germany, Australia and others, which have also established a process to improve the supervision of foreign investment from a national security perspective. The regulators will be able to submit investments for discussion by the Committee starting from January 1st, 2020.

The Cabinet will meet again in 6 months in order to review the work of the Committee and to carry out modifications if necessary.

The Activity of the Ports in Israel – The port operating model by means of the Israel Port Company using the landlord method and by means of the Port Authority

Aryeh Gavish

This chapter mentions the following entities:

The Israel Ports Company: The Haifa Port Company and the Ashdod Port Company which operate the ports and which are headed by the CEO of the Israel Ports Company.

The Port Authority: An organization created by a temporary agreement between The Shipyards and Ports Authority and the Israel Ports Company, which is situated between the Israel Ports Company and the port companies. Heading the Port Authority (the Ashdod Port Authority and the Haifa Port Authority) are executives who are employees of the Israel Ports Company appointed by the Minister of Transportation (see below).

The structural reform of the ports in Israel, which began in 2005, created the Israel Ports Company (IPC) which is mandated with managing and developing port assets in Israel according to the landlord model. In August 2019, an agreement was signed with the Marine services Department of the Haifa Port Company in order to transfer the department to the responsibility of IPC. There are negotiations also to transfer the Marine services Department in the port of Ashdod. The transfer of the marine services departments to the IPC (see below for the functions of the Marine services Department) will expand its functions the provision of operational services to the port companies, in addition to the development and management of real estate assets. This expansion of duties will widen the responsibility of the IPC to beyond just the management of assets to what is known worldwide as a “port authority”.

In most ports of the world, various companies are active in the geographic environs of the port and operate the ports’ various terminals. It is the port authority that manages the variety of services that are common to all of the corporations within the port. It is responsible for the execution of the port’s shared activities. Following is a list of the typical shared activities in a port, with specific reference to Israel’s ports:

1. The Marine services Department (vessel traffic service (VTS), piloting, tugging, piloting boats and other types of boats, mooring of ships, etc.).
2. Security. In Israel, the regulations regarding security in the ports are dictated by law and are under the authority of three government bodies: 1. The Israel Police under the authority of the Internal Security Ministry; 2. The General Security Service,

under the responsibility of the Prime Minister's Office; and 3. The navy – under the responsibility of the Ministry of Defense.

3. Maritime domain – excavation and maintenance of depth in the port's terminals.
4. Maritime domain – dealing with ocean pollution.
5. Maritime domain – navigation assistance, lighthouses, etc.
6. The port authority's responsibility for the development and maintenance of transportation channels from the port to trucks and the railway and vice versa.
7. Marketing.
8. Information systems – electronic messages (the IPCS system in the Israeli port system).
9. The management of the operational queue (the order of entry and exit of ships from the port).

The port authority in most of the world's ports is part of the municipal authority of the city in which the port is located. This structure has a major advantage in that the responsibility for all aspects of its activity (transportation channels, business development, marketing, etc.) is clearly allocated and the port becomes a leading interest of the municipal authority. Municipal officials have a major interest in developing the transportation channels to the port, to market the port among the harbor companies (the customers) and to support and encourage the port's activities as a source of growth for the city and to ensure that the activities in the port (rear terminals, foreign tourism – cruise ships, internal tourism, business development of the waterfront, tariff and courier agencies, etc.) are attractive to users. The activities of the municipal authority by way of the port authority can constitute an economic growth engine for the city and can contribute to the residents' employment opportunities and standard of living. However, as part of the reform of the ports in Israel in 2005, it was decided that the IPC would be the landlord of the assets of all three commercial ports (the ports of Haifa, Eilat and Ashdod), notwithstanding the built-in conflict of interest that might be created for the IPC by the fact that it is essentially the landlord of three competing ports.

The 2005 reform of the ports replaced the 1961 Ports Authority Law and dismantled the ports authority that operated Israel's ports into four government companies (the IPC, the Haifa Port Company, the Ashdod Port Company and the Eilat Port Company). The regulatory responsibility for the ports was transferred to the Shipping and Ports Authority (SPA) which became an authority under the Ministry of Transportation. It was decided not to confront the unions who opposed the transfer of the ports' marine services departments to the IPC and therefore the decision to fully transform the IPC

into a port authority with respect to the management of shared activities. Thus, the functions of the company were limited to the management and development of assets.

This is the reason that in 2007, a temporary agreement (which nonetheless has been in force for about 13 years) was signed between the IPC and the SPA, which defines the Haifa Port Authority and the Ashdod Port Authority. These authorities are meant to constitute a managerial infrastructure for transforming the IPC into the port authority of the Haifa and Ashdod ports with respect to all shared activities. These authorities were meant to enable the IPC to exercise its responsibility for operational domains in the ports. The agreement states that the Minister of Transportation would, for each authority, appoint a port manager who would essentially be the executive arm of the IPC in all its areas of responsibility in the ports. Additionally, it was decided that the port manager and his appointed assistant would carry out their functions by means of physical and managerial infrastructures that would be financed from the IPC budget. This agreement and its implementation in 2007 created an anomaly and distortions in the management of the ports, such that despite the official appointment of the port managers in the Haifa and Ashdod ports by the Minister of Transportation who were meant to have responsibilities and powers based on the Shipping and Ports laws (the Ports Ordinances – 1971), most of their powers were allocated to the managers of the port companies (Haifa and Ashdod) rather than to the port managers who are under the IPC. The Haifa and Ashdod port authorities operate according to this agreement, without a clear definition of functions and without responsibility for joint activities as required by the IPC's functions.

In 2008 and 2009, a failed attempt was made to transfer the full responsibility for security to the IPC and at the same time to cancel the temporary agreement between the IPC and SPA regarding the port authorities. This attempt occurred during the period of Gidon Siterman as Director General of the Ministry of Transportation (who had pushed for the full realization of the plan to make the IPC a port authority) and Shaul Mofaz as the Minister of Transportation. This move, which was meant to be the first step in fully transforming the IPC into a port authority will manage joint activities in the Haifa and Ashdod ports (and not just manage real estate and asset development activities), failed as a result of the staunch opposition of the unions in the Haifa and Ashdod ports, despite the government decision according to the recommendation of the Minister of Transportation to implement the transfer of responsibility.

In August 2019, the first agreement was signed for the transfer of the Marine services Department of the Haifa port from the Haifa Port Company to the IPC. However, the transfer of the Marine services Department in the Ashdod Port Company to the IPC

has not yet been agreed upon and as a result there is uncertainty with regard to the operation of this department (or parts of it) in the case of the port of Ashdod.

The IPC has full responsibility as landlord in the ports of Haifa, Ashdod and Eilat (which is anchored in the Shipping and Ports Authority Law–2004):

1. Development of the ports: In the current stage, this includes the development of the infrastructures of the Hamifratz and Hadarom ports and various upgrades of the Haifa, Ashdod and Eilat ports and the Future Development of Israel's Ports to 2048 (a research report carried out by Royal Haskoning DHV which is meant to recommend the optimal path for development of Israel's ports in coming generations).
2. The management of port land and specifically defined responsibility for the maintenance of infrastructures.

In order for the IPC to fully become a port authority, there is a need to amend the Shipping and Ports Authority Law–2004 and to make significant amendments to the Ports and Shipping laws (Port Regulations 1971) in order to adapt them to the changing reality of Israel's ports. These two legislative processes are of major importance and should be carried out as soon as possible in order to complete the 2005 port reform and in order to fully establish the IPC as a port authority.

The agreement to transfer the Marine services Department of the Haifa Port Company to the IPC and its proximity in time to the start of operations of the Hamifratz port in Haifa and the Hadarom port in Ashdod illustrate the need to firmly establish the IPC's responsibility for joint activities by means of subsidiary companies that will act as port authorities in Haifa and Ashdod.

The following corporations operate within the declared domain of the port of Haifa: the Israel Shipyards port, Dagon, Petroleum and Energy Infrastructures Ltd., Gadot, the chemicals terminal, the navy and the Shavit fishing wharf and by 2021 the Hamifratz port will begin operating as a private terminal operated by a subsidiary company of the Chinese company SIPG.

The following corporations operate in the port of Ashdod: the Ashdod Port Company, Israel Chemicals Ltd., Pier 30 for the import of cement and in the near future the Hadarom port which will be operated as a private terminal by TIL, a subsidiary of MSC.

The port of Eilat differs from the other two due to its relatively small size, the limited types of cargo that pass through it, etc. Therefore, the organizational structure requires separate consideration. It is clear that the IPC will continue to be the landlord of the

port of Eilat with regard to development and land, but with regard to acting as the port authority it may be possible to put it under the authority of the Ashdod or Haifa port authority or to establish a separate authority.

Following are the main steps that need to be taken in order to fully transform the IPC into the landlord of the Haifa and Ashdod ports:

Establishment of subsidiaries by the IPC which will serve as the "port authorities" of the Haifa and Ashdod ports. An agreement to transfer the Marine services Department of the Haifa Port Company was signed in August 2019; it already mandates the establishment of a subsidiary of the IPC to which the Marine services Department—consisting of about 110 workers and their equipment, tugs, vessels and coastal facilities—will be fully transferred.

Heading the port authority will be the port manager who will receive the relevant powers according to the Ports Ordinance (new version, 5731 – 1971). His powers will defined officially in an amendment to the Shipping and Ports Authority Law, 5764 – 2004.

The powers and responsibilities of each port authority in its domain will be as follows:

1. The Marine services Department, VTS compliance with IMO guidelines management of maritime transport.
2. Spatial security. The professional security officers (the regulators of port security) will instruct the security director of the port authority, who will ensure that the instructions are carried out by all the corporations present in the port.
3. The maritime domain (navigation aids, buoys, entrance canal, depth maintenance, etc.).
4. Responsibility for maritime transport within its territory and the safety of navigation according to the instructions of the SPA.
5. Dealing with ocean pollution in the port's maritime territory.

The following candidates for transfer to the responsibility of the port authority will be considered:

1. The planning of entry and exit of ships (the operational queue in each port) – it is recommended that this responsibility be transferred to the new port authority already on its creation.
2. Marketing of the corporations.
3. Maintenance of infrastructures.

There is an urgent need to update the Shipping and Ports Authority Law, 5764 – 2004 and the Shipping and Ports Law – the Port Ordinance in the relevant regulations.

The amendment of the Shipping and Ports Authority Law – the current law, which went into effect at the end of 2004, does not define the IPC as the landlord even though the company is fulfilling two important tasks that are defined in the law and which are the responsibility of a landlord: 1) the future development of the ports; and 2) responsibility for the current ports' land development. As mentioned, the law lacks a definition of the IPC as a landlord, which should be formulated according to the changes and updates in the Ports Ordinance. The legislation should be amended such as to enable the IPC's creation of two subsidiaries that will serve as port authorities responsible for the joint activities in each port.

Amendment of the Shipping and Ports laws – The Ports Ordinance (new version), 5731 – 1971. In the current version, there is in our opinion a distortion in the definitions that appear with regard to the responsibility of the port manager and that of the CEO of the Haifa Port Company or the CEOs of the companies/corporations operating in the port. The distortion is reflected in the fact that many powers of the port manager as defined in the Ports Ordinance are carried out by the CEOs of the Haifa Port Company and the Ashdod Port Company and/or the CEOs of the corporations in the port.

This is the reason that the director of the SPA assigned many of the port manager's powers to the CEO of the Haifa Port Company and in parallel assigned others to the harbor captain, powers which appear in the Ports Ordinance as assigned to the port manager (in the port of Ashdod, these powers were given to the CEO of the Ashdod Port Company since the positions of harbor captain was unfilled and was being carried out by the acting harbor captain).

This anomaly (or distortion) should be resolved by updating the Ports Ordinance and transferring the port manager's function to the following position holders according to their relevance and their functions:

1. To the CEO of the port company or corporation – according to the type of activity, the letter of certification, etc.
2. To the port manager who heads the port authority, which is a subsidiary of the IPC.
3. To the SPA – only regulatory functions.

In sum, the a comprehensive and detailed legislative process is needed in order to transform the IPC into a landlord of the Haifa and Ashdod ports and in order to enable the operation of the ports by the method of a port authority, the most common format worldwide, while regulatory matters should be the responsibility of the SPA.

The activity of the ports during 2018

This chapter summarizes the activity of the commercial ports in Israel (Haifa, Israel Shipyards, Ashdod and Eilat) and is based on data from the Statistical Abstract for 2018 published by the SPA. The data for exports of the Petroleum and Energy Infrastructures Ltd. and the import of crude oil through the port of Haifa are included in the Statistical Abstract of the SPA since 2014.

The energy ports (the Hadera port and the Ashkelon port) are not included in this survey. Coal is imported by way of the Hadera and Ashkelon ports. The Europe Asia Pipeline Company is involved in the import of fuels and cooking gas.

The Ashdod Port Company and the Haifa Port Company continue their traditional activity in the shipment of cargo. They are in discussions with the unions in order arrive at arrangements that will allow them to compete with the new ports being built and which are planned to go into operation in 2021. The Hamifratz port is being built near the port of Haifa and the Hadarom port is being built near the Ashdod port.

The Eilat Port Company, which was privatized in 2013, is also continuing its traditional activity. The main cargo handled by the port of Eilat is the export of phosphates and potash and the import of cars. The port was negatively affected by the cancellation of the import directive that cars produced in the Far East would be unloaded only at the port of Eilat.

According to senior officials in the port of Eilat, there is inbuilt discrimination against the port of Eilat even though the port is considered to be an essential strategic infrastructure for the State of Israel. The is reflected in the following:

1. There is no railway infrastructure to the port of Eilat.
2. The program of incentives for trucks to operate at night (the “goodnight” program) that exists in the ports of Haifa and Ashdod does not apply to the port of Eilat.
3. The closing of the Sde Dov Airport and the transfer of the Eilat airport northward to the Timna area will create additional congestion on the roads, which will negatively affect trucks bringing cargo to and from the port of Eilat.

The manager of the Eilat port is trying to make Eilat the home port for cargo headed for the Gaza Strip, including assistance from the Persian Gulf states. The intention is that the cargo will arrive at the port of Eilat and from there will be taken to the Gaza Strip by way of the Kerem Shalom border crossing. It appears that it will be a long time until this plan reaches fruition.

The Israel Shipyards Port Company, which is located in the statutory zone of the port of Haifa, continues to grow at a rapid pace and is approaching the limitations imposed on it by its letter of certification – 5 percent of all cargo handled by Israeli ports. Following the rejection of the port's request to the Ministry of Transportation to raise its quota for cargo, the Company turned to the Supreme Court. The Israel Shipyards Company has managed to attract most of the iron arriving in Israel by providing logistic services at the waterline to the customer and making the port into a distribution and logistics center for this type of cargo. The port has built an unloading, storage and distribution infrastructure for the import of cement (by means of its subsidiary), which is creating competition in the cement sector.

The movement of containers in 2018

There is a long-term global upward trend in the global movement of containers of about 4-6 percent each year. The movement of containers in Israel follows a similar trend.

In 2018, the movement of containers totaled 2.946 million containers, an increase of 2.7 percent from the previous year.

The Ashdod Port Company accounted for 1.477 million containers, a decrease of 3.2 percent relative to 2017.

The Haifa Port Company accounted for 1.469 million containers, an increase of 9.4 percent relative to 2017.

The Ashdod Port Company's share of total container traffic is 50.13 percent.

The Haifa Port Company's share of total container traffic is 49.87 percent.

In other words, the container traffic in Israel in 2018 was divided almost equally between the Haifa Port Company and the Ashdod Port Company.

The increase in the share of the port of Haifa in 2018 can be attributed partly to strikes, slowdowns and poor labor related relations between management and the unions in the Ashdod Port Company in various sections of the port. Some shipping companies changed their port of unloading to Haifa in view of this situation and this led to an increase in Haifa's container traffic.

Transshipment of containers in the Haifa and Ashdod ports

A total of 120,412 containers were designated for transshipment in Israel's ports in 2018, a decrease of 22 percent relative to 2017.

The port of Haifa accounted for 96.6 percent of transshipment while the port of Ashdod accounted for only about 3.4 percent. Despite the large drop in transshipment in the port of Haifa (of 22 percent), it continues to lead Ashdod in this area.

It appears that with the opening of the new terminals, efforts will be made to transform the terminals (by means of a deep-water pier of 17.3 meters, new large cranes and a huge warehousing space) into a hub for transshipment and in this way to compete with the regional hubs in the Eastern Mediterranean.

General cargo in 2018

A total of about 4.115 million tons of general cargo passed through the commercial ports, an increase of 6.7 percent relative to the previous year.

The Haifa Port company handled 655 thousand tons, an increase of 6.5 percent over 2017.

The Ashdod Port Company handled 1.622 million tons, a decrease of 13.6 percent relative to 2017.

The Eilat Port Company handled 176 thousand tons, a drop of 3.5 percent relative to 2017.

The Israeli Shipyards Company handled 1.662 million tons, an increase of 40 percent relative to 2017.

The year 2018 marked 10 years of operations as a port for the Israel Shipyards Port Company, located within the port of Haifa, since it received permission to operate as a port from the SPA. In 2018, the Israeli Shipyards Port Company became the leader in general cargo, a title which was previously held by the Ashdod Port Company, the port that has traditionally handled most of the general cargo in Israel.

Automated facilities in 2018

Automated facilities in the port of Ashdod:

- Israel Chemicals exports (phosphates and potash).
- Import of cement.

Automated facilities in the port of Eilat:

- Israel Chemicals exports (phosphates and potash).

Automated facilities in the Israel Shipyards port:

- Import of cement (storage of cement in special silos have made the port a storage and distribution center for cement).

Automated facilities in the port of Haifa:

- Import of seeds for Dagon.
- Import of crude oil to the SPL connection.
- Petroleum and Energy Infrastructures Ltd. exports.

In 2018, 21 million tons of commodities were handled by the automated facilities (export/import), an increase of 2.8 percent relative to 2017.

The port of Haifa handled 11.514 million tons, a decrease of 0.2 percent relative to 2017.

The port of Ashdod handled 6.291 million tons, an increase of 4.7 percent relative to 2017.

The port of Eilat handled 2.112 million tons, an increase of 6.3 percent relative to 2017.

The Israel Shipyards port handled 1.136 million tons, an increase of 20.6 percent relative to 2017.

Vehicle imports in 2018

In 2018, there was an additional drop in the import of new vehicles into Israel. The total number of vehicles handled by the Haifa, Ashdod and Eilat ports was 294,574, a decrease of 5.4 percent relative to 2017 (of which about 2,000 left the ports for other destinations).

Port of Haifa: 49,543 vehicles, a decrease of 11.4 percent relative to 2017.

Port of Ashdod: 140,096 vehicles, a decrease of 13.1 percent relative to 2017.

Port of Eilat: 104,935 vehicles, a decrease of 11.4 percent relative to 2017.

The lack of storage area for imported vehicles continues. Again this year, every available space was used including the use of operational piers that are meant for the loading and unloading of other types of cargo.

An attempt was made in the three ports to prepare special storage areas for imported vehicles in view of the importance attributed to this type of cargo.

The port of Eilat uses space that it leases from Kibbutz Eilot for the storage of imported vehicles.

The east Kishon work pier is meant to be returned to the port of Haifa by the infrastructure contractor working on the Hamifratz port. This pier will be used as a general cargo pier and among other things will be used as rear space for the storage of imported vehicles.

Passenger traffic in 2018

The total passenger traffic in 2018 totaled 168.4 thousand, a decrease of 4.5 percent relative to 2017.

The port of Haifa accounted for 134.8 thousand passengers, a decrease of 3.7 percent relative to 2017.

The port of Ashdod accounted for 21 thousand passengers, a decrease of 21.4 percent relative to 2017.

The port of Eilat accounted for 12.5 thousand passengers, a decrease of 30.9 percent relative to 2017.

Preparations by the Ashdod Port Company

The Ashdod Port Company is continuing to implement plans to prepare for the arrival of competition when the Hadarom port goes into operation. The data presented here are according to the understanding of the author and are based on conversations with port officials, articles in the press and the trends that are indicated in the ports' activity.

Following are the highlights of the Ashdod port's plan and activities (part of which appeared in last year's report):

The deepening of the eastern part of Pier 21 to a depth of 17.3 meters in order to facilitate the loading and unloading of container ships with a capacity of 18,000 TEUs. The western part of Pier 21 is intended for a seed conveyer of 2.4 km in length which will be jointly financed by the IPC and the Ashdod Port Company. The conveyer will be built up to the Dagon grain silos located in the rear of the port. The unloading will be by means of automatic pneumatic loaders according to the definitions of the Ministry of the Environment with the goal of minimizing air pollution.

The unloading of cement on Pier 24 will be carried out by means of automated loaders in order to prevent air pollution.

Piers 7 and 9 will become piers for the unloading of general cargo; the current storage space for vehicles will become a storage area for general cargo.

The establishment of a power plant fired by natural gas with a 5 MW capacity. The port will then have redundancy in the event of a power interruption.

The Marine services Department – Regardless of the decision whether the Marine services Department is transferred to the IPC, the department will receive two leased tugboats with 70-ton capacity. The Ashdod Port Company will lease another similar tugboat for the routing of ships with 18,000 TEU capacity. Additionally, two new piloting boats have been acquired.

The port is preparing defenses against cyber attacks in cooperation with the National Cyber Directorate and the ports servers have been fortified.

On the container pier, the arms of two of the bridge cranes have been lengthened and heightened. Additionally, a new large bridge crane has been acquired, bringing the total number of cranes on the pier to seven. Three of those have the ability to deal with 21 rows of containers.

Figrue 1: a tug boat from the maritime department at the port of Haifa

The preparations of the Haifa Port Company

The Haifa Port Company is continuing to implement its plans to prepare for the coming of competition when the Hamifratz port goes into operation. The data presented here are according to the understanding of the author, based on conversations with port officials, articles in the press and the trends that are indicated in the ports' activity.

Following are the highlights of the Haifa port's plan and activities (some of what follows appeared in last year's report):

The managers of the Haifa Port Company intend to find a strategic investor, following the approval given by the Ministry of Transportation. It is their intention to issue an international tender to choose a private/public company that can improve the port's ability to compete.

The eastern container pier will not be deepened at this stage. The Haifa Port Company will focus on bringing in large container ships with a capacity of 14,000 to 15,000 TEUs on the Hacarmel pier, on which two new bridge cranes have ben added. The existing bridge cranes will be lengthened and heightened in order to handle 21 rows of containers.

In the future, consideration will be given to deepening the eastern pier, which will depend on an assessment of the situation and whether a strategic investor is brought in.

The Haifa Port Company is planning to install three Gottwald cranes (dual use – electricity/diesel fuel) on the east Kishon pier, which is a work pier being used by the contractor building the infrastructure of the Hamifratz port. The pier will be renovated as a general cargo pier, which will include the unloading of imported vehicles. The management of the port intends to extend the railway tracks up to this pier.

It is planned that 6 advanced cranes for general cargo will be installed on the west Kishon pier.

The Kishon port will not be deepened at this stage.

A new cargo gate will soon begin operations, despite a number of problems in launching the project. It is believed that the new gate will improve the performance of the port, including the shortening of the queues of trucks entering and leaving the port.

The Haifa Port Company and the Haifa Municipality have set up a joint authority to plan and establish a water front, which will likely increase the port's revenues.

The upgrading of equipment for the unloading of a hopper accumulator (hoppers and funnels) according to the requirements of the Ministry of the Environment.

There is a plan to connect the east and west Kishon piers by an operational bridge above the Kishon river. The flow of operational vehicles will improve the port's performance in unloading and storage of general cargo.

Status of the Hamifratz port project:[1]

The construction of the Hamifratz port was begun in 2005. The chief contractor is Ashtrom-Shafir. It is expected to begin operations in 2021. The NIS 4 billion in construction costs are being financed from the budget of the IPC.

The construction is being carried out by the IPC which was also responsible for selecting the operator. The terminal will be operated by the Chinese company SIPG (a subsidiary of the Shanghai port), which was chosen in an international tender issued by the IPC. The port/terminal will consist of one 800-meter pier for container activity and a secondary pier of about 720 meters in length. The depth of the water is expected to be 17.3 meters.

About 550 dunams have been handed over to the operator which has begun work.

Status of the Hadarom port project:

The construction of the Hadarom port began in 2014 and it is expected to begin operations in 2021. The main contractor is the Chinese company PMEC. The NIS 3.3 billion cost of construction is being financed from the IPC budget. The construction is under the responsibility of the IPC, which also issued the international tender to choose the operator – the TIL company (a subsidiary of the MSC shipping company).

About 450 dunams have been handed over to the operator, which has started work.

1 Details on the status of the Hamifratz and Hadarom ports were provided by Dov Frolinger, VP for new terminals and international relations at the IPC.

Components of national cyber security arrays in the civil maritime sector

***Ofir Kafri*[1]**

This article presents examples of various methods used in cyber security arrays in the civil maritime sector in selected countries. In recent years, there has been progress in developing civil maritime cyber security arrays in a number of countries that have advanced in cyber security.[2] This trend has been reinforced, in part, by international and local cyber events and attacks.[3] Cyber security has even become part of the maritime strategies of some countries operating in the maritime domain.[4]

Different countries have established cyber security arrays in the maritime sector, with the goal of managing the risk to critical infrastructure and other facilities. These include, for example, maritime cybersecurity operations centers for ports and platforms for sharing information and facilitating coordination within the sector and with other sectors. Several countries are adopting cyber regulation that includes the maritime sector. Other related activity includes training and raising awareness, publishing directives, introducing standards, creating R&D infrastructure and fostering international cooperation.

Due to the limited scope of the article, it presents only some of the maritime cyber security array methods applied in the selected countries: Singapore, the Netherlands, Canada, Denmark and the United States. These countries were selected because they

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1 This chapter is part of a study written with the assistance of a research grant from the Center for Cyber, Law and Policy (CCLP) and the Maritime Policy and Strategy Research Center (HMS).

2 International Telecommunication Union (ITU), Global Cybersecurity Index (GCI) 2018: https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2018-PDF-E.pdf

3 Cyber events have occurred in ships, offshore drilling rigs, commercial port infrastructure, energy terminals (oil and gas), shipping companies, freight forwarding company, port service providers, shipping agencies, maritime regulators and others. See, for example: United States Senate, Report of United States Senate Committee on Armed Services, inquiry into cyber intrusions affecting U.S. transportation command contractors, iii, 2014; Coast Guard Maritime Commons site, Lt. Jodie Knox, Coast Guard Commandant on Cyber in the maritime domain, June 15, 2015; The Columbian, Dameon Pesanti, Port of Vancouver meeting hindered by cyberattack, March 10, 2017; The New York Times site, Thomas Erdbrink, Facing Cyberattack, Iranian Officials Disconnect Some Oil Terminals From Internet, published April 23, 2012; Clarkson PLC Annual Report 2017, Page 19, 83; Danish Broadcasting Corporation news site, Michael Lund and Niels Fastrup, Fremmed stat spionerede mod dansk ministerium (Foreign State spied on Danish ministry), published September 21, 2014.

4 See, for example, maritime strategy documents of the US and France: U.S. Navy, Marine Corps, and Coast Guard, A Cooperative Strategy for 21ST Century Seapower, March 2015, page 33-34; France National strategy for the security of maritime areas, October 2015, page 23-24.

play an important role in the global maritime sector and/or because they are developing national maritime cyber arrays. It should be noted that the capability, operational quality and efficiency of the arrays differ from one country to the next. The article concludes by outlining the main components in existing cyber arrays; these components are also recommended by international guides on cyber security.

Singapore's maritime sector

The civilian maritime sector is an important component in Singapore's economy and accounted for 7 percent of the country's GDP in 2017 and about 170,000 jobs.[5] Singapore is located in the Straits of Malacca and Singapore (SOMS), a critical strategic route in the global maritime transportation system. Every year, almost half of all global commercial maritime cargo and about 70 percent of Asia's oil imports pass through these two straits.[6] The Port of Singapore ranks second in the world in container traffic.[7] The cyber strategy of Singapore stresses the importance of defending maritime activity.[8] The Cyber Security Agency of Singapore (CSA) works with the Maritime and Port Authority (MPA) of Singapore to protect the civilian maritime sector.

The Maritime Cybersecurity Operations Center (MSOC) in Singapore began operations in May 2019, monitoring and coordinating all of the critical information infrastructure in the maritime sector.[9] The MSOC enables the MPA to work with critical information infrastructure operators to investigate cyber threats and events in the maritime sector. Plans call for connecting the MSOC to the MPA's Port Operations Control Centre (POCC), with the goal of facilitating a rapid and comprehensive response to cyber events.[10]

5 Singapore Ministry of Trade and Industry, Enterprise Singapore, Industry Profile, 2018: https://www.enterprisesg.gov.sg/industries/type/sea-transport/industry-profile

6 Singapore Ministry of Defence, Fact Sheet: The Malacca Straits Patrol, 21 Apr 2015: https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2016/april/2016apr21-news-releases-00134

7 Lloyds list, One Hundred Ports 2019: https://lloydslist.maritimeintelligence.informa.com/one-hundred-container-ports-2019

8 Singapore's Cybersecurity Strategy, Cyber Security Agency of Singapore, 10 Oct 2016: https://www.csa.gov.sg/~/media/csa/documents/publications/singaporecybersecuritystrategy.pdf

9 Cyber Security Agency of Singapore, Singapore's Operational Technology Cybersecurity Masterplan 2019, 01 Oct 2019, page 41: https://www.csa.gov.sg/~/media/csa/documents/publications/ot_masterplan/csa_ot_masterplan.pdf

10 Singapore Computer Emergency Response Team (SingCERT), Maritime, 08 Oct 2019: https://www.csa.gov.sg/singcert/publications/maritime

With respect to the training of personnel in cyber security, a new and more comprehensive course is being developed in cooperation with the Singapore Shipping Association and the Singapore Polytechnic. The course is designed to train personnel in cyber risk management, cyber security counter-measures and other subjects.[11] In addition, Singapore is conducting activities aimed at raising awareness of maritime cyber security, including seminars for both the private and public sectors.[12]

The Cybersecurity Act that went into effect in 2018 provides broad powers to the Commissioner of Cybersecurity and other officials appointed by the commissioner or by the relevant minister. The delegated powers facilitate the gathering and sharing of information, investigation and more. The law establishes cyber security requirements for essential infrastructure in the maritime sector. This includes infrastructure for monitoring and managing shipping, the operation of various types of terminals, refueling infrastructure, rescue operations and more.[13]

The Maritime Cybersecurity Research Program, which focuses on the protection of shipboard systems, will be carried out through cooperation between the MPA, institutions of higher education in Singapore and the Singapore Maritime Institute (SMI).[14]

International collaboration between Singapore and other countries also includes the sharing of professional information on the protection of infrastructure. For example, a memorandum on cyber security cooperation was signed with the Netherlands in 2016.[15] Another example is the hosting of an international forum for safety of navigation and environmental protection in the Singapore and Malacca Straits, which also addresses

11 Maritime and Port Authority of Singapore, New 24/7 Maritime Cybersecurity Operations Centre to Boost Cyber Defence Readiness, 16 May 2019: https://www.mpa.gov.sg/web/portal/home/media-centre/news-releases/detail/8a5114cf-8214-4b46-8999-2c6c42433b1e

12 Maritime and Port Authority of Singapore, Shaping the Future of a Cyber-smart Maritime Industry, 24 April 2018: https://www.mpa.gov.sg/web/portal/home/media-centre/news-releases/detail/0c373e30-7ff8-4a8a-a1d8-32bd3299ea4d

13 Singapore Legislation Division of Attorney-General's Chambers, Cybersecurity Act 2018, 12 Mar 2018: https://sso.agc.gov.sg/Acts-Supp/9-2018/Published/20180312?DocDate=20180312; Cyber Security Agency of Singapore, Cybersecurity Act, Explanatory Statement: https://www.csa.gov.sg/~/media/csa/cybersecurity_bill/cybersecurity%20act%20-%20explanatory%20statement.pdf

14 Singapore Maritime Institute, About us: https://www.maritimeinstitute.sg/about-us; Maritime and Port Authority of Singapore, New 24/7 Maritime Cybersecurity Operations Centre to Boost Cyber Defence Readiness, 16.5.2019.

15 Singapore and the Netherlands to Strengthen Cyber Security Cooperation, Cyber Security Agency of Singapore, 12 Jul 2016: https://www.csa.gov.sg/news/press-releases/csa-signs-mou-with-the-netherlands-to-strengthen-cyber-security-cooperation

cyber security.[16] The MPA is planning to establish international cooperation between parallel authorities with the goal of sharing information on threats and cyber events.[17]

The maritime sector was included in national cyber exercises managed by the Cyber Security Agency of Singapore in 2017 and 2019. The exercises tested the resilience of the maritime sector in a variety of cyber scenarios. The simulations included other critical sectors, with the goal of testing the preparedness for major cyber events, including inter-sectoral cooperation.[18]

The maritime sector in the Netherlands – the Rotterdam and Amsterdam ports

The Netherlands' Network and Information Systems Security Act, pursuant to the European Union's NIS Directive (EU) 2016/1148, went into effect in 2018.[19] The law requires providers of an essential service, including those in the maritime sector, to meet cyber security requirements. It authorizes government ministries or the national Computer Security Incident Response Team (CSIRT), according to the circumstances, to require reporting on cyber events. Additional delegated powers relate to investigation, auditing, sanctions, etc.[20]

The **Port of Rotterdam** is ranked first in Europe in volume of container traffic and eleventh in the world.[21] The port is an important component in the Netherlands' economy and in Europe's commercial maritime traffic.[22] In 2017, almost half of the commercial traffic in

16 Maritime and Port Authority of Singapore, 8th Co-operation Forum addresses key issues relating to Straits of Malacca and Singapore, October 2015: https://www.mpa.gov.sg/web/portal/home/media-centre/news-releases/detail/c8c677d0-07d1-4d9c-b634-ac416c4c29e9; Co-operative Mechanism on Safety of Navigation and Environmental Protection in the Straits of Malacca and Singapore, October 2015: https://www.soefartsstyrelsen.dk/Presse/Nyheder/Documents/Program_Co-operative%20Forum_Singapore.pdf

17 Maritime and Port Authority of Singapore, New 24/7 Maritime Cybersecurity Operations Centre to Boost Cyber Defence Readiness, 16.5.2019.

18 Cyber Security Agency of Singapore site, 11 CII Sectors Tested on More Complex Cyber Attack Scenarios, 04 Sep 2019: https://www.csa.gov.sg/news/press-releases/exercise-cyber-star-2019

19 Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016: https://eur-lex.europa.eu/eli/dir/2016/1148/oj

20 Netherland Network and Information Systems Security Act (Wet beveiliging netwerk- en informatiesystemen), Act of 17 October 2018: https://wetten.overheid.nl/BWBR0041515/2019-01-01#Hoofdstuk4_Paragraaf1_Artikel5

21 World shipping Council, Top 50 World Container Ports: http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports

22 Erasmus University Rotterdam, Centre for Urban, Port and Transport Economics, The Rotterdam effect, 18 Dec 2018: https://www.eur.nl/en/upt/news/rotterdam-effect; W. Heijman et al, The impact of world trade on the Port of Rotterdam and the wider region of Rotterdam-Rijnmond, Case Studies on Transport Policy, 5 (2017) 351–354.

the port (by cargo weight) served Europe and about one quarter served Asia.[23] A law enacted in 2018 defines the port as a provider of an essential service, thus obligating it to fulfill a number of cyber security requirements.[24]

The port operates in cooperation with the country's National Cyber Security Center (NCSC). Several cyber security bodies have been created at the port. One example is a cyber notification desk that receives reports of major cyber events; the desk has been operating as part of the port's operations center since 2018. Companies operating in the port that are subject to the ISPS code[25] or EU regulations[26] are required to report major cyber events to the notification desk and in some cases to other entities as well. These events relate to situations that affect the security of traffic in the port, the entry and exit of ships, and the implementation of the port security plan.[27]

In 2016, a port cyber resilience officer was appointed and a plan of action was formulated. The officer's area of responsibility includes training, raising awareness and managing cyber risks. To this end, committees were established to deal with the various aspects of cyber security, such as legislation and exercises. The cyber resilience officer works in cooperation with law enforcement agencies, municipal authorities and other bodies.[28] The port carries out cyber exercises and maintains a staff of cyber security experts who are responsible for protecting the port infrastructure.

23 Port of Rotterdam Authority, Facts and Figures, 2019: https://www.portofrotterdam.com/sites/default/files/facts-and-figures-port-of-rotterdam.pdf

24 Netherland Network and Information Systems Security Act (Wet beveiliging netwerk- en informatiesystemen), Act of 17 October 2018; Decision on network and information security (Besluit beveiliging netwerk- en informatiesystemen), Decree of 30 October 2018: https://wetten.overheid.nl/BWBR0041520/2019-01-01

25 International Ship and Port Facility Security (ISPS) is part of the Safety of Life At Sea Convention (SOLAS). The goal of the code is to strengthen the security of shipping and port facilities. For further information, see: International Maritime Organization (IMO), SOLAS XI-2 and the ISPS Code: http://www.imo.org/en/OurWork/Security/Guide_to_Maritime_Security/Pages/SOLAS-XI-2%20ISPS%20Code.aspx

26 Regulation (EC) no. 725/2004; Netherland Port Security Act: https://wetten.overheid.nl/BWBR0016991/2010-10-01

27 Port of Rotterdam, policy document port cyber notification desk: https://www.portofrotterdam.com/sites/default/files/policy-document-port-cyber-notification-desk.pdf?token=waAgc_VH; Port Cyber Hotline operational, 11 June 2018: https://www.portofrotterdam.com/en/news-and-press-releases/port-cyber-hotline-operational

28 Port of Rotterdam site, Port of Rotterdam appoints Port Cyber Resilience Officer, 13 June 2016: https://www.portofrotterdam.com/en/news-and-press-releases/port-of-rotterdam-appoints-port-cyber-resilience-officer

Cyber security conferences have been held to raise awareness and improve cyber training for businesses that operate in the port. The port offers a program of cyber security assistance for small businesses, which includes online training and tools that help to identify cyber weaknesses. The assistance is based on the realization that small businesses are important to the port's activity and are connected to important port systems, but do not have the resources to deal with complex cyber issues and therefore may constitute a weak link.[29]

The **Port of Amsterdam** initiated a program to upgrade cyber security in 2018. It presented e-learning modules about information security with the aim of raising awareness of the issue among workers and other stakeholders. The port recruited an information security officer and established a cyber security hotline.[30] The hotline receives voluntary reports in addition to compulsory reports from entities that are subject to the ISPS code.

The Port of Amsterdam cooperates in this area with the NCSC, the Port of Rotterdam, the Digital Trust Center (DTC) and other entities. In addition, the port has initiated a program for sharing information with the private and public sectors, including law enforcement agencies. It also sponsors public information events in cyber security in order to raise awareness and to provide professional information.[31]

Canada's maritime sector

A government forum called the Maritime Cyber Risk Project constitutes the basis for cooperation between ten different bodies from various ministries. The forum's goal is to propose possible solutions to cyber threats in the maritime sector.[32]

The Canadian Cyber Incident Response Center (CCIRC) operates a digital platform for disseminating information to critical infrastructure sectors and for enhancing cooperation. The platform facilitates the distribution of information according to levels

29 Port of Rotterdam site, How the Port of Rotterdam is investing in cybersecurity, 06 December 2016: https://www.portofrotterdam.com/en/news-and-press-releases/how-the-port-of-rotterdam-is-investing-in-cybersecurity

30 Port of Amsterdam Annual Report 2018, page 67, 72-73. Published on 6 May 2019: https://jaarverslag2018.portofamsterdam.com/wp-content/uploads/2019/06/Port-of-Amsterdam-Annual-Report-2018_final.pdf

31 Port of Amsterdam, Cyber security in the North Sea Canal Area (NSCA): https://www.portofamsterdam.com/en/port-amsterdam/organisation/cyber-security-nsca

32 NATO Association of Canada, Canada's Cyber Security: A Discussion with Public Safety Canada, 22 August 2018: http://natoassociation.ca/canadas-cyber-security-a-discussion-with-public-safety-canada

of security classification. The CCIRC is available to assist in the management of cyber events in critical infrastructure, including in the maritime sector, and operates support programs to help entities in the private sector carry out risk assessments.[33]

Entities subject to the maritime security regulations are required to include cyber security in their assessment and security programs. In certain cases, there is a requirement to report a cyber event to government bodies.[34]

Transport Canada, a federal institution, is responsible for establishing a cooperative network for conducting a sectoral risk assessment on an annual basis.[35] In 2016, Transport Canada published a document on cyber security best practices for the maritime sector.[36] Similar documents were published in 2016-2017 for the maritime sector in the United Kingdom. The documents present recommended methods for cyber security in port infrastructure and shipping.[37] France also published a series of documents in 2016-2018 on maritime cyber security[38] and, in 2019, the European Union Agency for Cybersecurity (ENISA) published best practices for cybersecurity in ports.[39]

33 Public Safety Canada, Fundamentals of Cyber Security for Canada's CI Community, Date modified: 2019-01-21: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/2016-fndmntls-cybr-scrty-cmmnty/index-en.aspx

34 Transport Canada, Marine Security Operations Bulletin, No: 2014- 001: https://www.tc.gc.ca/media/documents/marinesecurity/MSOB_BSOM_2014-001-en.pdf

35 Canada Action Plan for Critical Infrastructure, Date modified: 2018-01-31: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/pln-crtcl-nfrstrctr/index-en.aspx#aB

36 Transport Canada, Understanding Cyber Risk: Best Practices for Canada's Maritime Sector Page 16-17: http://publications.gc.ca/collections/collection_2016/tc/T86-21-2016-eng.pdf

37 UK Department for Transport & Institution of Engineering and Technology, Ports and port systems: cyber security code of practice, 16 August 2016: https://www.gov.uk/government/publications/ports-and-port-systems-cyber-security-code-of-practice; Ship security: cyber security code of practice, 2017: https://www.gov.uk/government/publications/ship-security-cyber-security-code-of-practice

38 France Ministry of Environment, Energy and The Sea, Directorate-General for Infrastructure, Transport and the sea, Maritime Affairs Directorate, Cyber Security - Assessment and Protection of Ships, September 2016 Edition: https://www.ecologique-solidaire.gouv.fr/sites/default/files/Guideline%201%20-%20Cyber%20security%20-%20Assessment%20and%20protection%20of%20ship.pdf; Cyber Security – Reinforcing the Protection of Industrial Systems on a Ship, France Directorate-General for Infrastructure, Transport and the sea, Maritime Affairs Directorate, January 2017 Edition

39 European Union Agency for Cybersecurity (ENISA), Port Cybersecurity - Good practices for cybersecurity in the maritime sector, November 26, 2019: https://www.enisa.europa.eu/publications/port-cybersecurity-good-practices-for-cybersecurity-in-the-maritime-sector/at_download/fullReport. For more examples of cyber security good practices in the maritime sector please see: BIMCO, The Guidelines on Cyber Security Onboard Ships, Version 3: https://www.bimco.org/-/media/bimco/about-us-and-our-members/publications/ebooks/cyber-security-guidelines-2018.ashx

Canada's Marine Security Operations Centers are responsible for managing events in the maritime domain. The centers assist in the assessment of risk to ports, vessels and maritime facilities. Each year, about 7,000 risks assessments are carried out for vessels entering Canada's maritime domain.[40]

The centers bring together various governmental bodies involved in the maritime domain. The centers focus on identifying and reporting maritime activity that poses a potential threat to security and safety.[41] In recent years, the area of cyber security has been added to the centers' responsibilities.

Denmark – Implementation of a maritime cyber security strategy

Denmark's national cyber strategy cites the maritime sector as one of the country's critical infrastructures. A cyber strategy document that specifically addresses the maritime sector was published in January 2019 and some of its recommendations have already been implemented.[42] The largest container shipping company in the world—A.P. Moller-Maersk—is headquartered in Denmark. A major cyber attack against Maersk in 2017 harmed the company and disrupted port operations in a number of countries.[43]

The Centre for Cyber Security (CFCS) provides assistance to the Danish Maritime Authority (DMA). The cyber strategy document states that the DMA should serve as a liaison between the maritime sector and the CFCS. Cooperation between the bodies includes the analysis and sharing of information on threats and assistance in risk evaluations for the maritime sector.[44] The first assessment was released to the public in 2017 and included recommendations for cyber security.[45]

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40 Transport Canada, Transport Canada defends Canada's waterways and coastlines, 2019-03-07: https://www.tc.gc.ca/eng/transport-canada-defends-waterways-coastlines.html

41 Government of Canada, Marine Security Operation Centres, 2013-05-23: https://www.tc.gc.ca/eng/marinesecurity/operations-269.html; Canadian Coast Guard site, 2017-12-14: http://www.ccg-gcc.gc.ca/eng/CCG/Maritime-Security/MSOC

42 Danish Ministry of Finance, Danish Cyber and Information Security Strategy 2018-2021, Page 8, 40: https://en.digst.dk/media/17189/danish_cyber_and_information_security_strategy_pdf.pdf; Danish Maritime Authority, Cyber and Information Security Strategy for the Maritime Sector: https://www.dma.dk/Documents/Publikationer/Cyber%20and%20Information%20Security%20Strategy%20for%20the%20Maritime%20Sector.pdf

43 MAERSK Site, News Release, A.P. Møller - Mærsk A/S Cyber attack update, June 28, 2017: http://investor.maersk.com/node/19831/pdf

44 DMA, Cyber and Information Security Strategy for the Maritime Sector, page 8-9.

45 Denmark Threat Assessment Branch under the Centre for Cyber Security, The cyber threat against the maritime sector, March 2017: https://fe-ddis.dk/cfcs/CFCSDocuments/The_Cyber_Threat_to_the_Maritime_Sector_march.pdf

In June 2018, a maritime cybersecurity unit was established in the DMA. The unit is responsible for implementing the measures prescribed in the strategy document, and serves as an advisory body, a communication center for the maritime sector and a source of expertise in the DMA. The unit is also responsible for coordinating an action plan with the maritime sector in areas such as regulation, training and raising awareness.[46] It participates in a cyber forum that includes all of the cyber units in Denmark's critical sectors. The goal of the forum, which operates in partnership with the CFCS, is to share information on threats and cyber events, and to promote cooperation between the various sectors.[47]

The DMA published an order on maritime cyber security that went into effect in February 2019. The order implements part of the European Union's NIS directive on cyber security (Directive (EU) 2016/1148)[48] and includes a number of obligations that apply to DMA-appointed operators of a maritime service. For example, in certain cases, there is an obligation to report a cyber event to the DMA and to the CFCS. Another requirement is to become certified as meeting international cyber security standards within two years of receiving an appointment from the DMA.[49]

The DMA works to foster cooperation in the cyber security field with other countries.[50] A cyber security forum that includes all of the authorities that have any direct influence on the maritime sector in Denmark is slated to be inaugurated in 2020-2021. The forum will prepare plans for responding to cyber events and emergencies, coordinate cyber exercises in the sector and more.[51]

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46 Danish Maritime Authority, Danish Maritime Cybersecurity Unit: https://www.dma.dk/SikkerhedTilSoes/Cybersikkerhed/Sider/default.aspx

47 Center for Cyber Security, De samfundskritiske sektorer og CFCS drøfter hændelseshåndtering og varsler: https://fe-ddis.dk/cfcs/nyheder/arkiv/2019/Pages/tredje-moede-i-vidensdelingsnetvaerket.aspx

48 New maritime regulation supports prevention of cyber attacks, Danish Maritime Authority, 31 January 2019: https://www.dma.dk/Presse/Nyheder/Sider/New-maritime-regulation-prevention-of-cyber-attacks.aspx

49 Danish Maritime Authority, Order no. 46 of 15 January 2019, Order on the security of network and information systems of importance to the safety and navigation of ships: https://www.dma.dk/Vaekst/Rammevilkaar/Legislation/Orders/Order%20on%20the%20security%20of%20network%20and%20information%20systems%20of%20importance%20to%20the%20safety%20and%20navigation%20of%20ships.pdf

50 DMA, Cyber and Information Security Strategy for the Maritime Sector, page 6-7

51 Ibid, page 9-10.

The United States – The maritime sector and the Port of Los Angeles

The U.S. Coast Guard, which is responsible for cyber security in the American maritime sector, published its strategy for cyber security in 2015.[52] There is extensive regulation of maritime security in the U.S.[53] Under certain conditions specified in the regulations, there is an obligation to report a cyber event to the Coast Guard, which operates the National Response Center (NRC) that deals with these reports.[54] The Department of Homeland Security's National Cybersecurity and Communications Integration Center (NCCIC) provides assistance to critical infrastructure. This includes transportation infrastructure, which encompasses the maritime sector.[55] The NCCIC operates a Hunt and Incident Response Team (HIRT) to assist organizations that have been attacked and request its intervention.[56] In addition, the Maritime and Port Security Information Sharing and Analysis Organization (MPS-ISAO), a non-profit partnership of the private and public sectors, serves as a platform for sharing information in the maritime sector.[57]

The Port of Los Angeles, ranked first in container traffic in the U.S., operates the Cyber Security Operations Center (CSOC). The CSOC is responsible for port infrastructure and is considered the first of its kind in the country. The port reported in 2019 that it is

52 Maritime Transportation Security Act of 2002, Executive Order 13636, Presidential Policy Directive 21, the Department of Homeland Security Blueprint for a Secure Cyber Future (2011), the 2014 DHS Quadrennial Homeland Security Review, the National Infrastructure Protection Plan of 2013, and the Department of Defense Cyber Strategy of 2015.

53 Maritime Transportation Security Act of 2002, 107th Congress, PUBLIC LAW 107–295—NOV. 25, 2002: https://www.congress.gov/107/plaws/publ295/PLAW-107publ295.pdf; Electronic Code of Federal Regulations (e-CFR) Title 33. Navigation and Navigable Waters Chapter I. Coast Guard, Department of Homeland Security, Subchapter H. Maritime Security Part 104-106. Vessels: Shttps://www.law.cornell.edu/cfr/text/33/part-104

54 Title 33 Code of Federal Regulations (CFR) §101.305 – Reporting, page 341-342: https://www.govinfo.gov/content/pkg/CFR-2015-title33-vol1/pdf/CFR-2015-title33-vol1-sec101-305.pdf; U.S. Coast Guard, Marine Safety Information Bulletin, Cyber Adversaries Targeting Commercial Vessels, May 24, 2019.

55 U.S DHS, National Cybersecurity and Communications Integration Center: https://www.us-cert.gov/sites/default/files/FactSheets/NCCIC%20ICS_FactSheet_NCCIC%20ICS_S508C.pdf

56 Marine Safety Alert, Cyber Incident Exposes Potential Vulnerabilities Onboard Commercial Vessels, July 8, 2019: https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/INV/Alerts/0619.pdf

57 U.S Coast Guard, The Maritime and Port Security Information Sharing & Analysis Center: https://homeport.uscg.mil/Lists/Content/DispForm.aspx?ID=45422&Source=/Lists/Content/DispForm.aspx?ID=45422; MPS-ISAO site: https://mpsisao.org

the only one in the country that is certified as meeting the cyber standard ISO 27001.[58] A plan to establish a Cyber Resilience Center to serve all of the entities connected to the port was initiated in 2019. The new center is expected to serve as a platform for sharing information and professional knowledge, coordinating operations and more.[59]

Conclusion and recommendations

This article highlights several key components in national cyber security arrays in the civilian maritime sector. The following summary of these components is not an exhaustive list of all possibilities. There are variations that can be tailored to the specific conditions and characteristics of each country. Wise use of the various tools, while establishing an optimal cyber security structure in the maritime sector, can support the effective management of the cyber domain.

A number of international guides offer professional insights that can assist in the creation of sectoral cyber security arrays. The arrays presented in this article make use of tools that are generally similar to those presented in the guides. The NATO Cooperative Cyber Defense Centre of Excellence (NATO CCDCOE), the European Union Agency for Cybersecurity (ENISA) and the International Telecommunications Union (ITU) are among the organizations that have published such guides.[60]

Here is a list of recommended components of a national cyber security array in the civilian maritime sector. These components are used in arrays worldwide and presented in the leading international cyber security guides:

Structure of the arrays: Main bodies and entities

1. **A national multi-sector cyber security body** – Serves as a professional resource for assisting the entity responsible for cyber security in the maritime sector. This body provides professional information, guidance, management of multi-sector exercises, a platform for cross-sectoral cooperation, etc.

58 Port of Los Angeles, Port Proposes the Creation of a Cyber Resilience Center with Stakeholders, April 25, 2019: https://www.portoflosangeles.org/references/news_042519_cybersecurity

59 Port of Los Angeles Cyber Resilience Center, Request for Proposals, July 24, 2019: https://kentico.portoflosangeles.org/getmedia/5d304eb8-71cf-4ba5-992c-86e311b5a682/RFP-Port-of-Los-Angeles-Cyber-Resilience-Center

60 NATO Cooperative Cyber Defense Centre of Excellence, National Cyber Security Strategy Guidelines, 2013: https://ccdcoe.org/uploads/2018/10/NCSS-Guidelines_2013.pdf; European Union Agency for Cybersecurity, NCSS Good Practice Guide, November 14, 2016: https://www.enisa.europa.eu/publications/ncss-good-practice-guide/at_download/fullReport; International Telecommunication Union (ITU), Guide to Developing a National Cybersecurity Strategy, 2018: https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-CYB_GUIDE.01-2018-PDF-E.pdf

2. **A maritime cyber security body** – Usually operates within a government entity responsible for the civilian maritime sector. This body interacts with the various entities in the maritime sector. Its functions may include implementation of programs for training and raising awareness, management of exercises in the sector, assistance and consultation, assessment of sectoral risks and threats, publishing of directives, etc. In addition, a cyber security operations center that operates in the maritime sector can facilitate the ongoing management and rapid response to any cyber activity in the sector. The center can provide a full picture of what is happening in the sector, can coordinate the information received from the various sources, can manage the response to major cyber events, etc.
3. **Cyber security entities in essential and non-essential maritime infrastructure** – Ports and maritime facilities should have a cyber security officer and a cyber security team if necessary. There is also an option to establish a cyber desk, a cyber security operations center, etc.

Training and awareness-raising programs

Training and awareness-raising programs among various audiences, such as workers in government entities connected to the maritime sector, workers at essential infrastructure and any others active in the maritime sector. The programs are usually tailored to each group.

Risk assessment

Risk assessment for the maritime sector, specific infrastructure and facilities, etc.

Exercises in the maritime sector and in a multi-sectoral framework

1. Participation of the sectoral cyber body and/or essential infrastructure participants in national cross-sectoral exercises.
2. Exercises in the maritime sector, including a number of entities or the entire sector.
3. Exercises at infrastructure facilities and in specific bodies.

Cooperation programs: Coordination, planning, guidance and sharing of information

1. **A multi-sectoral forum** – Participation in a national cross-sectoral forum for coordination and cooperation, including representatives of the body responsible for the maritime sector.
2. **Forum of government entities and/or essential entities** – Forum for coordination and cooperation that brings together all government bodies and critical infrastructure in the maritime sector. In some cases, the creation of a government forum that

includes only the governmental entities connected to maritime cyber security is recommended.

3. **Forum for all stakeholders in the civilian maritime sector** – A forum for coordinating and sharing information and capabilities, bringing together all of the entities in the maritime sector.

International cooperation

Cooperation with other countries, private and public bodies and international institutions in areas such as research, training, coordination of activity, intelligence, etc.

Research programs

A research program that includes academia, the government and the private and public sectors in the areas of cyber security in the maritime sector.

Regulation that provides means of enforcement, capabilities and tools

Legislation that provides efficient tools for managing cyber security in the maritime sector, while creating appropriate checks and balances. The legislation can include a legal foundation for establishing cyber bodies in the array. In addition, it can specify obligations such as the duty to report defined cyber events to the relevant government bodies. It is also recommended to establish a cyber entity with powers for gathering information, issuing directives and/or standards, supervision and oversight, investigation and management of cyber events in certain cases, etc.

Continuity and recovery plans

Preparing and implementing continuity and recovery plans for the maritime sector in general, and specifically for bodies and infrastructure in the maritime sector.

The Challenges in Operating Autonomous Vessels in an Era of Globalization –The Case of Autonomous Cargo Ships

Roi Naglar

Major technological changes in the world of shipping have in the past led to major transformations in the global economy. It may be that the shipping industry is currently confronting "disruptive"[1] technology in the form of autonomous technology,[2] which has the potential to change the global shipping market and to have a major impact on the global economy.

The goal of this chapter is to review the existing situation in commercial autonomous shipping and the challenges it faces, alongside the economic, social and political potential implicit in autonomous shipping.

Introduction – Society, technology and autonomy

The influence of autonomous technology on society, the ability to assimilate this technology and the implications of its introduction have been studied since the end of the 19th century, with the introduction of automization (in the form of machines that could do a predetermined number of actions without the intervention of an operator) in the textile industry and the replacement of workers by machines.[3] Already on the appearance of this technology, thinkers such as Adam Smith and Karl Marx pondered its implications for society. The main question that arose was what opposition there would be if the demand for labor declined and if the technology indeed would replace human beings. These questions highlighted the close connection between technology and society.

New technology is shaped by the society that develop it, but once the technology is introduced, it is the technology that shapes society.[4] The absorption of technology in society is the result of power struggles and negotiations between various groups

1 Disruptive innovation is a term that originated in the world of technology and it describes innovation that leads to the creation of a new market, and later on to the disruption of the existing one (the traditional market) until the new category becomes dominant and displaces the traditional category.

2 An autonomous system is one that carries out its task completely independently or semi-automatically or under supervision, when it operates under conditions of uncertainty. The system responds accordingly to the existing situation, which is in contrast to an automatic system that repeats the same action independently of its environment.

3 Moraes-Neto, Benedito. 2004. 'Automation and Labor: Is Marx Equal to Adam Smith'. *Rethinking Marxism* 16(4): 407–22. https://doi.org/10.1080/0893569042000270898

4 Enduring, T H E, and Dilemmas of. 1995. 'TECHNIQUE Langdon', 67–72.

within society, where each group pulls in the direction that advances its own interests. The final result of the introduction of technology is that the group which managed to advance its interests in the most effective manner is the one that will shape the technology, rather than the technology meeting a real need that will generate efficiency and benefit for all.[5] Elements of nationalism, national security and the global economy are added to the mix, which increases the complexity of the interactions between the various players.

The shipping industry is an example of a socioeconomic structure with a large number of players with different interests and from different countries.[6] The socioeconomic structure of the shipping industry in unique in view of its high level of globalization, which involves an encounter between players on different types (nation-states, commercial players, regulatory authorities, etc.) within a changing regulatory environment (laws of flag state, ports, international waters, straits, etc.) and as such it constitutes a unique environment with respect to the manner in which it reacts to technological change.

Autonomous ships in the world of shipping

Commercial shipping is spread out all over the globe and is considered to be an important lifeline of global society. Currently, about 80 percent of all global trade is seaborne;[7] nonetheless, the rate of penetration of new technologies into the shipping market is slow relative to other domains.[8] During the past two years, the International Maritime Organization (IMO) has held discussions and conferences in order to determine whether to permit the use of autonomous commercial ships[9] and it has sought the opinions of the relevant players on this question.

As mentioned, changes in the world of shipping have led to a number of revolutions in the global economy.[10] The main ones have been the transition from ships propelled by rowing to large sailing vessels, which shifted control of the seas from the Ottoman Empire in the direction of Western Europe. The next transition was from sailing ships

5 Erez, Ram, the Hebrew University, "The politics of innovation: Networks as an area for change in Israel's defense policy" (2009). [Hebrew]

6 Hannigan, John. 2017. 'Toward a Sociology of Oceans'. *Canadian Review of Sociology* 54(1): 8–27. https://doi.org/10.1111/cars.12136

7 Review of Maritime Transport 2018, UNCTAD https://unctad.org/en/Pages/Publications/Review-of-Maritime-Transport-(Series).aspx

8 Rødseth, Ø. J., & Burmeister, H. C. (2012). Developments toward the unmanned ship. In *Proceedings of International Symposium Information on Ships–ISIS* (Vol. 201, pp. 30-31)

9 IMO: http://www.imo.org/en/MediaCentre/HotTopics/Pages/Autonomous-shipping.aspx

10 Fischer, Lewis R, and Even Lange. 2019. 'Introduction', 55–58.

to steamships propelled by coal and finally from steamships to ships propelled by fuel oil. These change brought with them the ability to transport large quantities of cargo of many types and led to the shift in center of gravity in global trade.[11] In recent years, we have been witness to a shift of global trade in the direction of East Asia, and with it dominance over the shipping market.[12] It may be that part of the interest that is driving the shift to autonomous ships is the attempt by interested parties in the European nations to maintain dominance over trade routes, by means of a technological revolution, namely the introduction of autonomous ships, in the domain of commercial shipping.

One of the main questions relating to the development of autonomous commercial shipping is whether this capability is the outcome of technological determinism, which the integration of technology simply because it exists or whether there is a real need filled by the autonomous technology. The answer to this is provided by examining the feasibility of developing autonomous ships and the main factors that justify the development of this technology, which are as follows:

Safety – Improving the safety level of shipping and cargo, reducing the number of maritime accidents and the severity of their outcomes.

Ecology – Transport of cargo that is more friendly to the environment, in terms of both direct pollution from ships (such as greenhouse gas emissions) and greater safety (see above) which reduces sea pollution incidents as a result of accidents.

Economic – Reducing the cost of transporting cargo and increasing its volume and greater efficiency in the supply chain (see below).

Social – Opening up the world of sea trade to additional sectors, raising maritime awareness and development in peripheral areas.

Political – Preserving political control of important trade routes.

Obstacles on the way to full autonomy

The ability to integrate autonomous ships must first be given a solid regulatory foundation. The regulation to be introduced can provide an indication of the technological hurdles that must be overcome in order to fill in regulatory lacunae. This will make it possible to better characterize the engineering needs of autonomous ships. The path to the integration of autonomous ships (given that the business model has been examined and found to be feasible, as will be described below) starts with mapping the regulatory lacunae.

11 Rødseth, Ørnulf Jan. n.d. ‘Developments toward the Unmanned Ship’, no. 314286

12 Ibid., UNCTAD.

Apart from the specific capabilities that exist on a ship, the regulations that need to be approved are influenced by a number of mutually dependent factors. The main factors that play a role in defining future regulation are as follows: [13]

Regulation of the legal domain – Unmanned ships are operated from control centers located in various countries; they sail in the sovereign waters of various countries; and they operate in the same environment as manned ships, all of which call for new legal regulation.[14]

Rules of Navigation at sea and prevention of collisions – The IMO is the UN committee that establishes regulations for ship traffic. It establishes laws and rules for ship safety and regulates sea traffic in order to ensure safe sailing and prevent ship collisions. These laws were formulated by a subcommittee called COLREGS (Convention on the International Regulations for Preventing Collisions at Sea). A reexamination of the rules of navigation at sea is necessary in view of the hybrid situation that will exist in the future (the simultaneous presence of manned and unmanned ships) and the expected behavior of unmanned ships. For example, there may not be the possibility of creating direct contact in the short run between two captains in order to prevent a collision, a possibility that does exist today, and it will be necessary to change the rules of navigation (such that there may be ship lanes in which only unmanned ships can sail).

A change in the composition of manpower operating a ship – The transition to unmanned ships will bring about a radical change in the composition of manpower and the number of crew members that will operate a ship. These changes will call for a change in the level of training and in salaries, as well as a transition period that may create opposition from unions and from developing countries whose citizens are employed on ships.[15] The transition period may arouse additional opposition as in the case of similar technological developments in the past.

Reduction in the environmental impact of sea transport – One of the justifications for the feasibility of developing autonomous capability should be the avoidance of much of

13 Chwedczuk, M. (2016). Analysis of the legal status of unmanned commercial vessels in U.S. admiralty and maritime law. *Journal of Maritime Law and Commerce*, 47(2), 123-170; IMO Committee, 2018: Committee, Maritime Safety, English Regulatory, Scoping Exercise for the, U S E of, Maritime Autonomous, and Surface Ships. 2018; Maritime safety committee 99th session Agenda item 5 MSC 99/INF.3 18 January 2018 regulatory scoping exercise for the use of maritime autonomous surface ships (MASS).

14 Chwedczuk, Michal. 2016. 'Analysis of the Legal Status of Unmanned Commercial Vessels in U.S. Admiralty and Maritime Law'. *Journal of Maritime Law and Commerce.*

15 Huang, C. Y., & Nof, S. Y. (2001). Automation Technology. Handbook of Industrial Engineering: *Technology and Operations Management*, 155-176

the maritime environmental damage caused by commercial ships. The IMO has defined the reduction of environmental harm originating from ships as one of the main targets of the shipping world, which is to be accomplished by reducing pollution from ships, the regulation of dumping of bilge water and ballast water at sea, etc. The changes in regulation in favor of autonomous capabilities must be part of this effort by the IMO.

Modifying port and ship infrastructures – The justification of autonomous capability is that ships will be able to sail without a crew. This will require a redefinition and modification of infrastructures in the ports, at port entrances (defining the arrival of the pilot) and of the ships themselves. For example, a solution will needed for the absence of technical crew members on a ship who can make repairs and as a result there will be a need to increase the reliability and redundancy of the main systems on a ship.

Responsibility and ship safety – Ship safety currently relies on meeting the IMO's regulatory standards for technical systems and also on the professionalism (seamanship) of the ship's crew. In the event of an accident, responsibility is determined on the basis of the crew's performance. The IMO's guidelines state that "…every ship will have certified officers on it who have appropriate training and on whom rests the legal responsibility to prevent accidents."[16] A fully autonomous system that makes decisions and maneuvers the ship based on those decisions will raise questions of responsibility in the event of an accident. For example, does the responsibility rest with the supervisor located in a far-off control room, on the developer of the algorithm that operates the ship, on the developer of the hardware and the physical equipment (such as electronic sensors) or on ship owners?[17] Such questions remain open as of now and need to be answered.

Cyber security – Currently, ships are not online most of the time, their navigation and maneuvering systems are isolated and the ability to damage the software of these systems is relatively low.[18] Autonomous ships that are remotely controlled will have to be constantly connected to an information system that will be vulnerable to attack. Currently, when a maneuver is carried out by a crew member, even in the case of a cyber attack, there is a crew member who can "take the wheel". In contrast, in the case of a cyber attack on an autonomous ship this crew member is not present and the ship's systems will have to be better protected than they currently are, including the network that supervises the autonomous ship and its degree of control. The various

16 IMO 94 4.B.

17 Chwedczuk, Michal. 2016. 'Analysis of the Legal Status of Unmanned Commercial Vessels in U.S. Admiralty and Maritime Law'. *Journal of Maritime Law and Commerce*.

18 IMO Committee, 2018

categories that need to be examined are interrelated and overlapping and there is no single category that stands alone. A change in the operating crew will require a change in regulations to prevent collisions and vice versa. All this will require cyber security and new legal and insurance frameworks. The relations between the categories can be seen in Figure 1 below. At this stage, the IMO is still mapping out all of the regulatory lacunae in the domain of autonomous ships, although it is still in the stage of finding solutions, whether regulatory or technological.

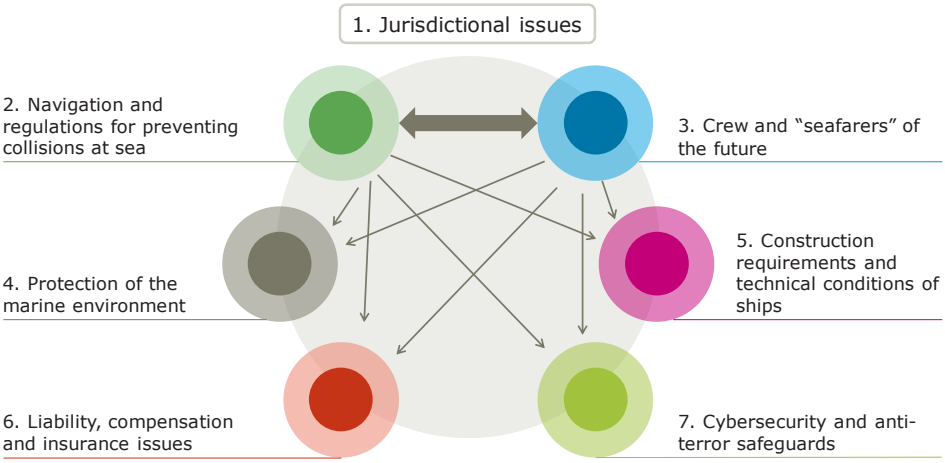

Figure 1: The categories and components of the required regulatory changes and the relations between them[19]

The feasibility of developing autonomous ships

Technology in general and autonomous technology in particular in the world of shipping lags behind other industries, such as air transportation and automobiles.[20] Artificial intelligence capabilities, including a system's ability to learn on its own, are path-breaking technologies that have the ability to bring about a technological revolution in many domains. The main question to be asked is whether the examination of the technology and the start of development of autonomous technology are the result of technological determinism? According to this approach, technological progress is an irreversible and inevitable process which has far-reaching implications for the social

19 ANALYSIS OF REGULATORY BARRIERS TO THE USE OF AUTONOMOUS SHIPS, Danish Maritime Authority Report, By Ramboll and CORE Advokatfirma. Denmark, December 2017 https://www.dma.dk/Documents/Publikationer/Analysis%20of%20Regulatory%20Barriers%20to%20the%20Use%20of%20Autonomous%20Ships.pdf

20 Ibid., Huang and Nof.

structure and the division of power between various groups in society. According to this theory, technological progress is what creates new technologies rather than social-sociological needs leading to technological progress.[21] A more sophisticated model is that of the competitive network, which explains the ability to introduce a technology into a social structure as the result of a power struggle between various players that make up the sociological structure.[22] Thus, there is a connection between the structure of the social-sociological body and the ability to introduce technology. According to the network model, there is a close relationship between the technological solution that in the end is attained, and the characteristics of the network that makes up the social structure.[23] The artificial intelligence technology that led to the autonomy of transportation vehicles such as drones has existed for a number of years, and there is a need to determine whether there is a real need to adopt it in the world of shipping or that its very existence led to the start of its introduction, as explained by the technological determinism model or whether the pace of its introduction is determined by conflicts between the bodies that determine regulation on the conceptual level (the IMO committees) as posited by the network model. It can be assumed that indeed there are socioeconomic needs that autonomous ships can meet and that there are a number of major advantages in the development of autonomous commercial ships that make the development of the technology worthwhile:[24]

Economic sustainability: Autonomous ships will make crews redundant and will save labor costs, which account for about one-third of a commercial ship's operating expenses (depending on the ship's size, its type and its age; see table 1).[25] The reduction in the size of a ship's crew less the additional manpower needed in the control room will result in a saving of about 10 percent of the total average cost of a voyage.

In addition, an unmanned ship will make it possible to reduce the ship's speed and thus to increase its efficiency (since one of the constraints that dictates a higher speed on a voyage is to arrive as quickly as possible in order to save on the payment of the high salaries of crew members during a sea voyage). The reduction in speed will reduce the consumption of fuel and will increase profitability.

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21 Ibid., Erez.

22 Enduring, T H E, and Dilemmas Of. 1995. 'TECHNIQUE Langdon', 67–72.

23 Erez, Ram, "The politics of innovation: Networks as an arena for change in Israel's defense policy (2009), the Hebrew University of Jerusalem, n.d. [Hebrew]

24 Rødseth, Ørnulf Jan. n.d. 'Developments toward the Unmanned Ship', no. 314286.

25 OPEX- ship operating expenses.

Table 1: Percentage of manpower costs according to type of ship, in millions of dollars[26]

	Daily operating costs in US$ per day						
	Handysize	Handymax	Supramax	Panamax	Post Pmax	Capesize	VLCC
#Ships (2010)	2963	2124	n/a	1412	387	921	197
#Crew	18	18	18	19	20	20	22
Manning	1.779	1.779	2.247	2.359	2.366	2.648	2.662
Insurance	655	720	770	785	790	1.030	1.190
Stores/Lubes	610	625	650	770	780	875	1.010
M&R	1.590	1.634	1.837	2.099	2.370	2.622	2.765
Admin	651	651	700	749	793	837	833
Total OPEX	5.285	5.409	6.204	6.762	7.099	8.012	8.460
Man/OPEX	34%	33%	36%	35%	33%	33%	31%

Ecological sustainability: Pollution and harm to the maritime environment and the coasts due to the human element is particularly serious. This is the result of mistakes in the pumping of liquids within the ship and dumping out at sea. Other causes of pollution are the bilge water created by crew members which is dumped at sea and garbage (such as food leftovers) that are thrown overboard during a voyage.[27] The saving in time on a voyage and the reduced speed will also result in a significant reduction in emissions of air pollutants. Unmanned ships will lead to the optimization of sailing speed, a reduction in the amount of dumping and the prevention of maritime pollution as the result of human error.

Social sustainability: The world of shipping is perceived as a man's world, since most of the positions on a ship are filled by men. This is a result of the need to leave one's family for long periods while the ship is at sea. The nature of the work has prevented large number of women from working on ships. An autonomous ship will be operated from a control room, which will be manned according to normal shifts, thus allowing operators to be with their families at the end of a shift. The change in the character of ship operation will facilitate the integration of women as ship operators. In addition, and in view of the large communication distances between the control room and the ship, there will be no need to locate the control room near a port or even near the coast. It will be possible to locate control rooms in peripheral locations and thus to encourage higher-skilled employment in these areas, as well as increasing maritime awareness.

Prevention of collisions: According to a 2012 report published by the German Marine Insurance Association, between 75 and 96 percent of maritime collisions are the result human error, which is often due to fatigue.[28] It is estimate in the automobile industry

26 Rødseth, Ørnulf Jan. n.d. 'Developments toward the Unmanned Ship', no. 314286.

27 Ibid., IMO Committee, 2018

28 Porathe, Thomas. 2016. 'Autonomous Ships PPT', http://onlinepubs.trb.org/onlinepubs/mb/2017Spring/Porathe.pdf

that close to 92 percent of accidents are the result of human error.[29] In view of the accumulation of experience in the operation of autonomous automobiles starting from 2007 it is expected that casualties in vehicular accidents will be reduced by 90 percent[30] thanks to the increased use of decision-supporting autonomous systems (see Figure 2). Maritime collisions cause casualties, they result in air pollution and they lead to high insurance premiums. Reducing the number of maritime collisions will have an impact on other aspects of the environment (such as prevention of huge oil spills as a result of collisions), the economy (reduction in insurance premiums that will reduce shipping costs) and of course personal safety of the crew. The removal of the human component from the decision-making process in the remote control of autonomous ships is expected to significantly reduce the number of maritime collisions.[31]

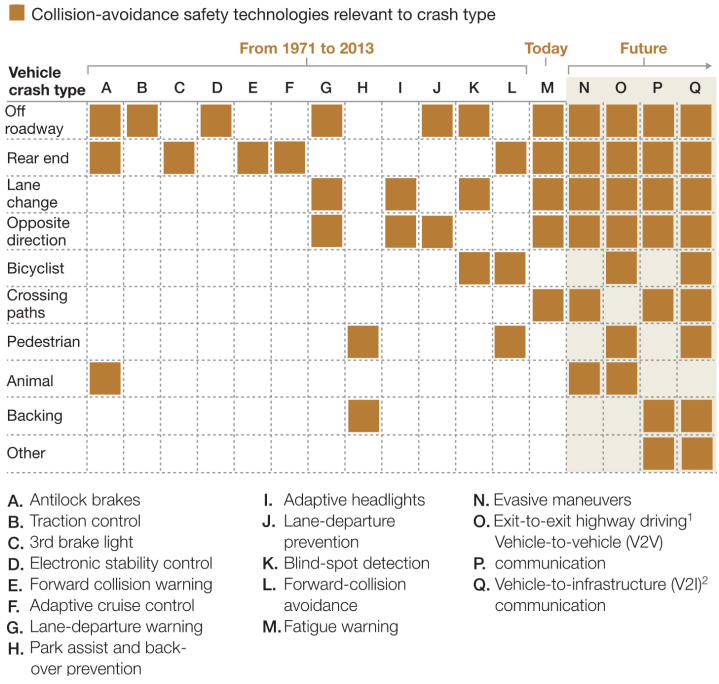

Figure 2: Decision-supporting systems for vehicular accident prevention[32]

29 Frey, Carl Benedikt. The Technology Trap . Princeton University Press.2019 p 309.

30 Jean-François Bonnefon, Azim Shariff, Iyad Rahwan, The social dilemma of autonomous vehicles, Science Vol 352, Issue 629 24 June 2014.

31 Chwedczuk, Michal. 2016. 'Analysis of the Legal Status of Unmanned Commercial Vessels in U.S. Admiralty and Maritime Law'. *Journal of Maritime Law and Commerce*; IMO Committee, 2018.

32 P. Gao, R. Hensley, A. Zielke, "A roadmap to the future for the auto industry," McKinsey Quarterly (October 2014); www.mckinsey.com/industries/automotive-and-assembly/our-insights/a-road-map-to-the-future-for-the-auto-industry.

In sum, it appears that from a feasibility point of view there are significant elements that an autonomous ship will improve and they may constitute an advantage for many population groups around the world and in a number of ways, including preserving the environment and reducing shipping costs.

In addition to economic and environmental sustainability, there is also the issue of political-economic sustainability, particularly in the case of Western countries. In recent years, Western Europe has become less dominant in maritime commerce. This is the result of a decline in maritime awareness among the population in these countries. This process began with the reluctance in these countries to work on ships.[33] Ships' crews originate, for the most part, from Asia and Eastern Europe and this pool also provides ship captains who later in their career become managers in the shipping companies. Another stage in this process occurred as the shipping companies came under Asian ownership, such that Western European countries were no longer owners of the ships or operating the shipping routes. Autonomous capability together with the operation of ships from control rooms on dry land will require trained manpower that will work under more convenient and more technologically advanced environment. These control rooms will make it possible for crews in Western Europe to operate the ships and in this way the dominance of Western Europe in shipping can be maintained. Maintaining control of the shipping routes creates a clear interest among the Western European countries to support and advance the shift to autonomous ships, in contrast to the interest of developing countries, such as India, the Philippines, Ukraine, etc., who currently provide the crews for ships.

The current status of autonomous ships worldwide and in Israel (the Mediterranean) in particular

As of today, there are no local or international regulations that relate to the use of autonomous ships.[34] Nonetheless, there is progress in research and testing of autonomous ships being carried out by private companies and navies. Most of the information in this essay was gathered from the publications of commercial companies rather than from academic articles.

The Rolls Royce company together with the Kongsberg company have published a roadmap that emphasizes the importance of autonomous ships and the path to achieving that capability.[35] The document describes the process by which they intend to develop an autonomous ship, including a detailed specification of such a ship. The

33 Rødseth, Ørnulf Jan. n.d. 'Developments toward the Unmanned Ship', no. 314286.

34 Ibid., IMO committee 2018.

35 Levander, O. (2017). Autonomous ships on the high seas. IEEE Spectrum, 54(2), 26-31

Company, together with Finnferries, a Finnish-owned ferry company, demonstrated the first autonomous ferry in 2018 which operates in an archipelago south of the city of Turku.[36] The Company has also developed an advanced research facility at Turku with the goal of developing the technologies necessary for a future autonomous shipping industry.

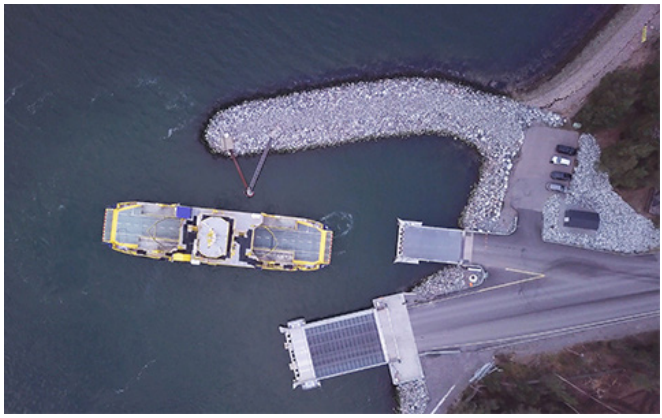

Figure 3: An autonomous ferry of the Kongsberg and Rolls Royce companies operating in Finland[37]

According to reports, the US navy has successfully sailed a Medium Unmanned Surface Vehicle (MUSV) from San Francisco to Pearl Harbor and back (on the way to Pearl Harbor a technical intervention became necessary in order to repair piping).[38] The EU has published its multi-year R&D plan (Horizon 2020) which includes the development of autonomous ship technologies[39] while the IMO has already held a number of conferences on the subject and has issued a work plan for developing regulation in this domain.[40]

China is currently at the forefront of research in autonomous ship technology, together with the Scandinavian countries and the US. This can be seen in the testing, research

36 ROLLS-ROYCE and FINFERRIES demonstrate world's first fully autonomous ferry' https://www.oneseaecosystem.net/rolls-royce-and-finferries-demonstrate-worlds-first-fully-autonomous-ferry

37 Ibid.

38 Sea Hunter Unmanned Ship Continues Autonomy Testing as NAVSEA Moves Forward with Draft RFP, https://news.usni.org/2019/04/29/sea-hunter-unmanned-ship-continues-autonomy-testing-as-navsea-moves-forward-with-draft-rfp

39 Autonomous Shipping Initiative for European Waters, https://trimis.ec.europa.eu/project/autonomous-shipping-initiative-european-waters

40 Ibid., IMO committee 2018.

and articles being published in China on this topic.[41] China's project to develop an autonomous ship reached an important milestone with the launch of the country's first autonomous cargo ship, the Jin Dou Yun O Hao, which at the end of 2019 completed its first trial voyage. The Chinese company Yunzhou Tech (which specializes in projects involving the use of unmanned vessels to carry out surveys) began the project in 2017, together with the Wuhan University of Technology.[42] In collaboration with the port of Shanghai, a simulator was built to test the decision-making system which is based on a database of decisions made at sea.[43] The city of Zhuhai is currently developing a special testing area for autonomous ships, as part of its plan to develop an industrial platform for this new sector. The maritime testing zone, called Wanshan, will cover an area of 77.6 square kilometers and will become the largest testing area in China and the world for autonomous ships.[44]

Figure 4: The autonomous ship Jain Doui Yun O Hao[45]

In Israel, there a number of programs to develop an autonomous ship but all of them are for military purposes. These vessels carry out maneuvers and missions in the Mediterranean and some are even operational. The Protector USV, developed by Raphael, is a 15-meter long patrol boat that is already in service with the Israeli

41 Department of Maritime Operations, University of South-Eastern Norway, Horten, Norway.

42 https://www.marinetechnologynews.com/companies/company/yunzhou-tech-200990

43 Xue, Jie Van Gelder, P.H.A.J.M. Reniers, Genserik Papadimitriou, Eleonora Wu, Chaozhong Elsevier Ltd 2019 Multi-attribute decision-making method for prioritizing maritime traffic safety influencing factors of autonomous ships' maneuvering decisions using grey and fuzzy theories.

44 https://www.port2port.co.il/article/ הובלה-ימית/ספנות-קווית/סין-אנייה-אוטונומית-ראשונה-סיימה-הפלגת-מבחן-בהצלחה

45 "China: The first autonomous ship successfully completed a test voyager", port2port, December 16, 2019.

navy and has participated in a number of NATO exercises.[46] The Elbit company has launched a similar ship called the Seagull, which is the same size as the Protector and has capabilities for towing arrays such as sonar, for surface protection and for mine detection. It is already in service with the Israeli navy.[47] A similar ship, called the Katana, was launched by Israel Aircraft Industries[48] and has similar abilities to the ships developed by Raphael and Elbit. In the underwater domain, Elta has developed an unmanned diving vessel with the ability to replace sensors and to carry out operational missions. It appears that Israeli industry is well advanced in the development of autonomous vessels but this is being done only in the military domain.

As of today, the development of autonomous maritime capability is concentrated among a small number of technological companies, in contrast to the regulatory issues which are receiving much wider attention in the IMO committees.

Figure 5: From left to right: The Protector developed by Raphael,[49] the Katana developed by Israel Aircraft Industries[50] and the Seagull system developed by Elbit[51]

Conclusion and Recommendations

The survey of the advantages and disadvantages of autonomous ships indicates that there is a genuine need for this technology. Nonetheless, the current regulation of the domain is far from providing a solution to the introduction of this capability, particularly in the hybrid stage when there are both manned and unmanned ships in the same environment.

46 https://www.rafael.co.il/worlds/naval/usvs

47 Seagull™, Elbit Systems' USV Performed Live Remotely Operated Anti-Submarine Warfare Mission, https://elbitsystems.com/pr-new/seagull-elbit-systems-usv-performed-live-remotely-operated-anti-submarine-warfare-mission/

48 KATANA USV System https://www.iai.co.il/p/katana

49 see footnote 46.

50 see footnote 47.

51 see footnote 48.

The solution to the regulatory lacunae and the ability to apply the technology should be multilayered, with regard to both the levels of autonomy to be introduced and the environment and situation in which they will be introduced. This guideline is based on the idea that the more crowded an environment is, as in the case of narrow straits and harbor entrances, the lower the level of autonomy that should be implemented in that environment (at least in the initial stages). Over time, with the improvement in technologies and the increasing level of reliability of the systems, the level of autonomy that can be introduced in complex and crowded environments can be raised. In view of the regulatory processes needed to achieve international consensus, it is possible to begin with local operation of autonomous ships in an environment that does not span any international boundaries, as in the case of the Finnish ferry described above. As mentioned above, Israel has proven abilities in the domain of unmanned ships, primarily for military use. In view of the commercial potential and the huge size of the global shipping market, it is worthwhile encouraging the commercialization of these military technologies by means of various industrial development measures, such as support from the Innovation Authority on various tracks (grants, technological incubators, etc.), the establishment of commercialization bodies and arenas for testing the feasibility of new technologies to be operated by Israeli players in the maritime domain, such as the ports of Haifa and Ashdod, and also dealing with regulatory aspects, such as defining a maritime zone for testing the technologies.

In conclusion, developing autonomous capabilities appears to be worthwhile and feasible and will bring about significant improvements that will benefit shipping and society in general, although a multi-faceted plan is needed for the implementation of this technology.

The Energy Sector in Israel: Opportunities and Challenges in the New Decade

Elai Retig

The completion of the Leviathan gas field's development marks the beginning of another important decade for the Israeli energy sector. The decade will be characterized by greater energy security for Israel than the previous one, increased government royalties, and a continuation of the downward trend in air pollution. At the same time, the export possibilities for Israel's gas will remain limited to its bordering neighbors due to the drop in natural gas prices in Europe and due to the Turkish-Cypriot and Israeli-Lebanese disputes surrounding the delineation of maritime borders, which will continue to limit the potential for the development of regional resources. The mutual attacks by Iran and Saudi Arabia on the other's oil assets in the Persian Gulf will create new security risks to the regional oil market, which may also have implications for Israel's oil imports. While increasing the use of renewable energy for electricity production can be part of the solution to these challenges, technological and economic barriers make this an unlikely trend for now. These developments, which are both positive and negative for Israel's energy security, are expected to increase the importance of the Eastern Mediterranean region as a source of energy, as the route for future pipelines, and as a potential market in the coming years

The start of production from Leviathan

The beginning of the new decade is marked by the entry of the Leviathan gas field into Israel's energy sector. Israel's economy will feel the benefits from the field only in about two years. With an initial production capacity of 12 billion cubic meters (BCM) of natural gas per year, the Leviathan field will reinforce Israel's energy security by providing an additional source of natural gas, following a decade in which the economy has been dependent on a single gas field and a single pipeline for all its needs. The new field will also bring long-awaited competition into the domestic gas sector and, together with the development of the Karish andTanin fields in 2021, a drop in natural gas prices. These benefits will be reflected in the Israeli consumer's electricity bill only in 2022 after the Israeli Electricity Company renegotiates its contract with the owners of the Tamar field. The Leviathan field will also yield larger revenues for the State in the form of royalties, which will be deposited in the Sovereign Wealth Fund, particularly after the implementation of the export contracts with Jordan and Egypt. The ability of the government in the coming decade to use this fund in a responsible and long-term manner, rather than simply for ongoing government expenditures, will be put to the

test in the event that an economic crisis or an insolvent pension system threaten the stability of the Israeli economy and the scope of its social welfare policy.[1]

The start of production from the Leviathan field will also lead to reduced use of coal in Israel's electricity production, a trend that will lead to an additional reduction in air pollution. It is worth mentioning that most of the reduction in the use of coal in Israel's fuel mix and the accompanying health benefits were already realized during the past decade (a reduction from 60 percent in 2010 to only 30 percent of Israel's electricity mix in 2018), due to the Tamar field coming online in 2013.[2] Additionally, the development of the new field also includes certain environmental risks on its own.[3] At the same time, it appears that the successful development of the Leviathan field has encouraged the Ministry of Energy to aspire to even loftier environmental goals. It has announced that by 2025 it intends to close all of the coal-fired power plants in Israel, in contrast to the previous policy of leaving enough coal to provide 17 percent of Israel's electricity.[4] One of the motives behind the Ministry of Energy's sudden decision to accelerate the process stems from its desire to be part of an exclusive club of nations that have declared their complete abandonment of coal in order to mitigate climate change, even though Israel's move will have only a negligible effect on the global effort to reduce greenhouse gas.[5] On the other hand, the new Ministry of Energy's targets will lead to an almost complete reliance on natural gas for the production of electricity, since renewable energy is not expected to fill the gap within such a short timeframe. This

1 For further discussion of the danger in irresponsible use of sovereign wealth funds, see: Humphreys, M. & Sandbu, M. E. (2007) "The Political Economy of Natural Resource Funds", in Humphreys, M., Sachs, J. D. & Stiglitz, J. E. (eds.) Escaping the Resource Curse. New York: Columbia Univ. Press.

2 The Electricity Authority, Report on the Electricity Sector for 2018, p. 24. https://pua.gov.il/Publications/PressReleases/Pages/doch_mashek_2018.aspx [Hebrew]

3 These risks primarily include the emission of pollutants during the production process in a location close to shore. Nonetheless, the Ministry of the Environment has decided that these dangers are negligible if strict environmental rules are obeyed. Ministry of the Environment, "The policy of the Ministry of the Environment on the production of natural gas," December 2018. http://www.sviva.gov.il/subjectsEnv/SeaAndShore/GassOilSea/gas_production_from_leviathan_rig/Pages/moep_general_policy.aspx [Hebrew]

4 The Ministry of Energy – press release, "Minister of Energy Steinitz: the end of the coal era in Israel has been reset for 2025 – the timetable for the conversion of the coal-fired plants to natural gas will be shortened," November 2019. https://www.gov.il/he/departments/news/ng_131119 [Hebrew]

5 This club, which is led by Canada and Britain, is called the "Powering Past Coal Alliance" and is led by countries that in any case do not use much coal to produce electricity. For the British declaration establishing the club, see: UK Government Press Release, "Climate Change Minister Claire Perry launches Powering Past Coal Alliance at COP23". Department for Business, Energy & Industrial Strategy, November 2017. https://www.gov.uk/government/news/climate-change-minister-claire-perry-launches-powering-past-coal-alliance-at-cop23

dependency makes the security of the Tamar and Leviathan fields even more critical since one field cannot quickly compensate for the loss of the other in the event of a malfunction or sabotage in one of them. Therefore, it is likely that the larger power plants will maintain their dual-use ability to quickly convert to coal and/or diesel fuel if necessary, and coal will continue to fulfill an important role as a backup fuel for electricity production in an emergency.

Israel's gas export possibilities remain limited

Despite the successful development of the Leviathan field, the possibilities for the export of Israel's natural gas will remain limited just to its close neighbors for the time being —Jordan, Egypt and the Palestinian Authority.[6] The main reason for this is the price drop for natural gas in Europe as a result of increased competition and the surplus of liquified natural gas (LNG) exports coming from the US, Australia and Russia. This competition is expected to keep prices low until the mid-2020s,[7] a reality that makes it economically unfeasible to construct ambitious undersea pipelines from Israel to Europe (such as the "East Med Pipeline" to Greece and Italy) or new liquefaction facilities in Israel or Cyprus which would cost about $5 billion. This does not imply that in the future it will not be possible to offer natural gas to Europe at a competitive price, particularly if additional large gas fields are discovered in the region (whether by Israel, Lebanon or Cyprus), but at this stage private investors in Europe are not rushing to invest in the construction of expensive infrastructure to import a relatively small amount of gas from the Eastern Mediterranean at a price that is not competitive. On the other hand, there is a possibility that the EU itself will decide to invest in the construction of a pipeline or in new LNG facilities as part of its effort to diversify away from Russian gas, rather than as a decision based on economic rationale. This investment is liable to be conditional on political demands directed by the EU towards Israel (such as investment in Palestinian infrastructure or showing notable progress in peace negotiations with the Palestinian Authority) and therefore it is likely that this investment will be made only in Cyprus and that a future LNG facility will be located there rather than in Israel.

Adding to these constraints is the fact that even if the gas companies in Israel manage to offer a competitive price to Europe and to attract foreign investment in an expensive undersea pipeline project, their ability to export will be dependent on the

6 On the limited possibilities of export for the gas companies in Israel, see: Elai Retig, "Developments in the Natural Gas Sector in Israel," in Shaul Chorev (ed.) , *Maritime Strategic Evaluation for Israel 2017/18*, January 2018, pp. 155–162 .

7 Michael Fulwood, "Short- medium- and long-term outlook for LNG," The Oxford Institute for Energy Studies. November 2019. https://www.oxfordenergy.org/publications/short-medium-and-long-term-outlook-for-lng/?v=7516fd43adaa

willingness of the region's countries to cooperate with one another. This condition is particularly challenging in the case of Turkey and Cyprus. During the past year, Turkey demonstrated its resolve to demand a share in Cypriot gas finds by sending warships into Cypriot waters to prevent exploration vessels from operating in the area. At the same time, Turkey began itself to explore in Cypriot waters and decare a new maritime border with Libya despite Cyprus' opposition.[8] It appears that there will be no way to avoid Turkey's involvement in any offshore infrastructure project that includes Cyprus' exclusive economic zone (EEZ). This will reduce Israel's profit from exporting (or at the very least will limit its control over export destinations) and will require it to collaborate with the Turkish government more closely. Adding to the Turkish-Cypriot conflict is the Israeli-Lebanese dispute surrounding the delineation of a maritime boundary between the two countries. Although this dispute does not prevent the export of gas from the Leviathan field, it may delay additional exploration projects in Lebanese and Israeli waters and may even deter new investors from coming in.

Apart from the problems in exporting to Europe, the gas companies in Israel are also finding it difficult to implement local export contracts, particularly that with Egypt. In 2018, a10-year export deal was signed between the Tamar and Leviathan owners and the Dolphinus Holding Company in Egypt for 64 BCM of natural gas. At the time of the signing, it was still unclear how the companies would get the full amount of gas to Egypt and it seems that even a year later there is no clear answer to this question. According to the original plan, the direction of the pipeline that previously brought gas from Egypt to Israel by way of the Sinai Peninsula (and which has been unused since 2011 due to repeated and deliberate sabotage) would be reversed. However, there are serios capacity constraints on the gas pipelines in Israel that are meant to feed into this pipeline during periods of peak seasonal demand for gas in Israel. Therefore, it is unclear whether the owners of Tamar and Leviathan will manage to provide the full quantity specified in the contract. In addition, the security threats in Sinai have still not been dealt with and this places the reliability of the proposed supply line in question. Having said that, the Egyptian government is now the owner of the pipeline (rather than a private company as in 2011), which gives it greater immunity.

These challenges will force the gas companies to invest more effort in competing over the domestic market in Israel, particularly after the Karish and Tanin fields come online in late 2021, and to ensure exports to Jordan as the main anchor for Leviathan, despite the opposition on the Jordanian street. These trends are not necessarily negative.

8 Michele Kambas, "Tensions grow as Cyprus says Turkish drilling ship violates its rights," Reuters. October 4, 2019. https://www.reuters.com/article/us-cyprus-turkey-ship/tensions-grow-as-cyprus-says-turkish-drilling-ship-violates-its-rights-idUSKBN1WJ0HQ

If Israel intends to completely tie the fate of its electricity sector to the availability of natural gas, then the urge to export gas to more distant destinations will have to be restrained. Exporting to Europe or Asia will perhaps provide temporary profits for the State, but in the long term Israel's energy sector is liable to find itself without sufficient energy sources if the technology that is meant to replace natural gas in the future (mainly solar) does not live up to its promise. .

Energy independence and the global oil market

Israel does not enjoy "energy independence" nor is it likely to experience it anytime soon. The reason being that natural gas is not an alternative to oil but only to coal in the production of electricity and heat. Israel currently imports about 250,000 barrels of oil per day, which is similar to the amount it imported a decade ago. Overall, oil constitutes about 40 percent of its total fuel consumption.[9] The introduction of electric vehicles into the Israeli market, which is not expected in the immediate future due to various barriers,[10] will not have a major effect on the demand for oil since private vehicles are not the main source of that demand. At the top of the list are planes, ships, trucks and petrochemical plants, and of course Israel's military.

Therefore, Israel devotes major efforts to ensure the availability of reliable and affordable supplies of oil, which arrive by sea. Israel's main oil suppliers are Azerbaijan and Russia, as well as Kazakhstan. Israel sometimes acquires oil from the Kurdish autonomous area in northern Iraq when this is possible. While Israel has a relatively diverse set of suppliers, almost all of its oil is transported through Turkey, whether by way of the BTC pipeline from Azerbaijan to the Turkish port city of Ceyhan, or through the Bosporus Strait. Israel refines the oil it receives at the Bazan refineries in Haifa and exports some of the output back to Turkey. This trade has remained stable over the years despite the various political upheavals.

Although Israel has enjoyed a secure supply of oil throughout the past decade, recent developments in the Persian Gulf are threatening this status quo. A series of attacks and mutual sabotage operations between Iran and Saudi Arabia in the Persian Gulf reached a peak on September 14th, 2019 when the oil refineries at Abqaiq in Saudi Arabia, which are the most important in the world, were attacked by Iranian drones. The attack temporarily cut Saudi oil production in half, which translates into a 6 percent reduction in global oil production (about 5.7 million barrels). The attack on Saudi

9 U.S. Energy Information Administration, "Israel – Overview". https://www.eia.gov/beta/international/analysis.php?iso=ISR

10 Dubi Ben Gedaliah, "The electric car is gaining momentum worldwide – why not in Israel?" *Globes*. October 28, 2019. https://www.globes.co.il/news/article.aspx?did=1001304822 [Hebrew]

Arabia is an indication of the current resilience of the oil market, considering how the unprecedented disruption in supply had almost no effect on world oil prices. On the other hand, the attack also demonstrated the possible fragility of the market, with oil facilities again becoming a legitimate target in regional conflicts, as occurred during the 1980s in the context of the Iran-Iraq war. Accordingly, the price of insuring oil tankers that travel through the Persian Gulf has skyrocketed. In addition, as investment in new oil exploration continues to be low around the world and global oil supply declines, the chance has increased that a similar attack in the future will be felt much more.

The attacks in the Persian Gulf have had only an indirect effect on Israel since the oil from the Gulf is destined primarily for East Asia. Nonetheless, oil prices are set globally and to the extent that there is a shortage on one side of the world, the price will increase for everyone, including Israel. Secondly, the direct involvement of Turkey in Syria as part of its military campaign against the Kurds on its southern border increases the potential for friction between Turkey and Iran on Syrian soil, something that is liable to lead to the sabotage of Turkish infrastructures (both by the Kurds and the Iranians), including oil pipelines that traverse Turkey on their way to the Mediterranean.[11] In the event of sabotage of the pipelines or a blockade of the Bosporus Strait, Israel will experience an immediate and urgent shortage of oil. Therefore, maintaining Israel's sources of oil, all of which arrives by sea, is as important as the security of the natural gas facilities in Israel's economic waters.

Renewable energy

Renewable energy may have a role to play in Israel's response to the expected challenges to its energy sector in the coming decade. First, the production of electricity from sources other than natural gas will help diversify its fuel mix and reduce its dependency on natural gas, while adding to the country's energy independence. Second, the reduction in domestic demand for natural gas will release more supply for export, which will make exporting more worthwhile and will increase the State's royalties. Third, the diversification of Israel's sources of energy production will reduce the sector's exposure to sabotage, missile attacks and various technical breakdowns and will allow for larger-scale entry of private electricity producers (including households who can produce electricity by means of PV solar panels on their roofs, which will reduce the pressure on the Israel Electricity Company in peak periods of demand). Fourth, the shift to renewable energy will reduce air pollution and greenhouse gas

11 There have been attacks on Turkey's oil pipelines in the past, so this is not a new phenomenon. In 2008, a Turkish oil pipeline blew up (apparently as the result of a cyber attack) and similarly the oil pipeline from Kirkuk to Ceyhan has been sabotaged periodically. The main danger arises from the scale and sophistication of the sabotage if Iran becomes involved.

emissions which result from the production and burning of natural gas, although the extent of this reduction is not sufficient to justify a transition to renewables on its own. Accordingly, the Minister of Energy, Dr. Yuval Steinitz, has proposed to set a new target for the introduction ofrenewable energy Israel's electricity sector – from 6.5 percent currently to 30 percent by 2030.[12]

While the Energy Minister's decision to increase the share of renewables in Israel's electricity sector was met with public criticism for not being ambitious enough, it is actually overly ambitious. Apparently the new target is based on that of the European Environment Agency (EEA) which set a target of 32 percent by 2030.[13] However, most of the renewable energy in Europe is produced by three sources that are not relevant to Israel: hydroelectric (Israel lacks the required rivers), wind (which is sufficient only in small areas in the Golan Heights) and the burning of wood (which the EU considers to be clean renewable energy, despite numerous studies that contradict this position). In contrast, Israel's renewable energy potential is primarily limited to solar. So far, no country is able to produce 30 percent of its electricity from solar energy, due to the many technological constraints it contains. In the current situation, there is no economic logic for Israel to commit to such a massive and unprecedented transition into solar energy before the technologies for storage (batteries) and the cost efficiency of the solar panels relative to their price and the surface they take up justify such a commitment. Israel has twice demonstrated during its short history the ability to quickly convert its energy sector, as long as the technology exists.[14] In the mid-1970s, as a result of the OPEC oil embargo and the increase in oil prices, Israel decided to convert its power plants from diesel to coal and in less than a decade went from 100 percent dependence on diesel to 80 percent dependency on coal. Furthermore, during the past decade Israel shifted its energy sector from coal to natural gas within a short timeframe. Once solar technologies are further developed, Israel will be able to shift relatively quickly. Although the transition of electricity production from one fossil fuel to another is much less complicated than the transition to solar or wind energy (due to the lack of continuity that characterizes this energy and the need to construct a more advanced electricity grid), Israel's energy sector is small and closed-off (both

12 Ministry of Energy – press release, "Minister of Energy Steinitz's initiative: A new target for the production of electricity from renewable energy for 2030 will be 25-30 percent," November 2019. https://www.gov.il/he/departments/news/re_171119 [Hebrew]

13 European Environment Agency, "Renewable energy in Europe – 2018", EEA Report No 20/2018. https://www.eea.europa.eu/publications/renewable-energy-in-europe-2018

14 In contrast, the unfortunate case of the "Better Place" company illustrates what happens when a new and promising technology is introduced into a small market before it has fully matured.

geographically and demographically) and blessed with sunshine, such that the change can be accomplished within a decade.

Conclusions

The trends described above are expected to increase the importance of the Eastern Mediterranean for Israeli energy security in the near future: 1) The higher expected dependence of Israel's electricity sector on natural gas as a result of the closing of coal-fired plants increases the need to protect Israel's maritime domain and the resources found in it. Renewable energy can reduce this dependency in the future but various technological and geographic constraints will slow down its introduction in the coming decade. 2) Numerous political and economic barriers require the gas companies to invest most of their efforts in the development of the regional gas market (Israel, Jordan, Egypt, the Palestinian Authority and perhaps in the future also Lebanon) rather than the search for more distant export markets in Europe and Asia. This preference will lead to, among other things, the laying of additional undersea pipelines in Israel's sovereign waters, particularly between Israel and Egypt, as an alternative or a supplement to the land pipeline in Sinai, which is liable to constitute a target for recurring sabotage. 3) The conflicts between Cyprus and Turkey and between Israel and Lebanon surrounding its maritime boundaries and the granting of exploration licenses increase the potential for friction between various forces in the Eastern Mediterranean. If the countries in the region wish to attract international energy companies and to develop their common resources, they must adopt a different approach that encourages cooperation and the sharing of profit. 4) Security threats to the stability of the oil market and the main routes of supply, particularly in the Persian Gulf, require that Israel reexamine its supply routes and search for alternative sea routes for the import of its oil, in the event that the Turkish route is temporarily disrupted.

Potential Impacts of Climate Changes on Israeli Maritime Security

Semion Polinov

As a small, densely populated country characterized by population and economic growth against a backdrop of land and water scarcity, Israel recognizes the importance of preparing for climate change in wide scope of this phenomena. Over the past decade, various Israeli research initiatives, consisting of representatives of government, academia, industry and non-governmental organizations, have been collecting knowledge on climate change and its impact on water, health, biodiversity and green building, analyzing these areas on an interdisciplinary basis using geostrategic and economic perspectives. Although (due to its geo-strategic situation) Israel is an “island” country largely dependent on the sea, scientific studies on the effects of climate change on maritime security are in their infancy. This article presents modern knowledge about climate change in the world and in the Israel region, its potential impact on various aspects of the maritime security of the State of Israel and recommendations in accordance with this knowledge.

Current knowledge about Climate Change

To address the issue of climate change and their potential impacts, two fundamental issues need to be solved: identification and attribution, considering the geographical component, rather than a global issue or a local one at the state level. None of this is simple in the event of climate change. Results of climate change is part of today's reality (IPCC, 2014). During the 21st century significant changes are expected in the climate around the world. For most parts of the world, the average temperature has risen by an average of 0.6-0.3°C (Fig. 1) since 1860 and is expected to rise by 1.8°C to 2100°C (IPCC, 2014). Jones (1999) pointing on global surface air temperature raise in period of 1925-1944 by 0.370 C and over the period of 1978-1997 0.320 C (Jones, et al., 1999). While human activities are estimated to have caused approximately 0.5-1.0°C of global warming (McMichael, et al., 2006). These changes can lead to critical harm to human well-being and natural systems. There are no disagreements about the importance of these changes, but there is uncertainty about their power.

The Global economic loss due to an increase in temperature of 4°C is estimated at approximately 5% of the world's annual GDP, with the economic loss in specific regions significantly higher (Kompas, Pham, & Che, 2018), and this is just one example from a various impact of expected effects of climate change and global warming. The viability and prediction of a climate changes cost/benefit view of the adjustment process is expected to increase over time and the investment in prevention and adaptation is expected to be more worthwhile as the scientific knowledge will increase and

uncertainty becomes less. Scientists have high confidence that global temperatures will continue to rise for decades to come, largely due to greenhouse gases produced by human activities (IPCC, 2018).

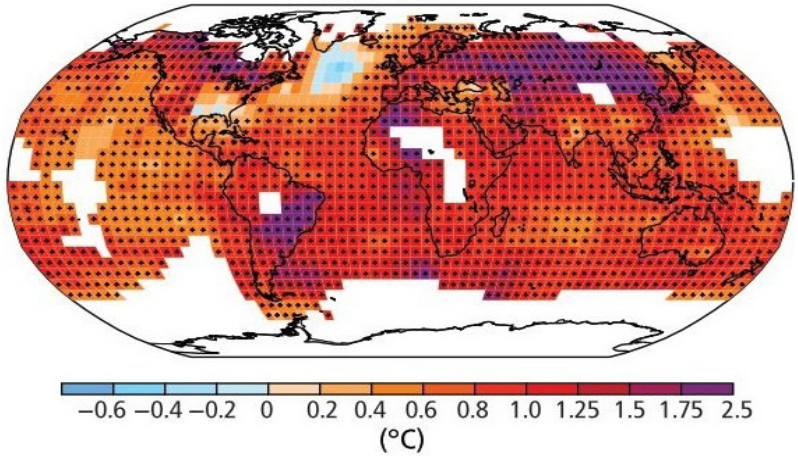

Figure 1: (a) Map of the observed surface temperature change, from 1901 to 2012; (b) Map of observed precipitation change, from 1951 to 2010 (IPCC, 2014).

The sea level is one of the key indicators of climate change. On time-scales of millions of years, geological processes, such as changes in ocean basins geometry caused by plate tectonics, are dominant in affecting sea-level change, whereas on shorter time-scales of years and decades, oceanographic and climatic factors are more dominant (Lichter, Zviely, Klein, & Sivan, 2010)

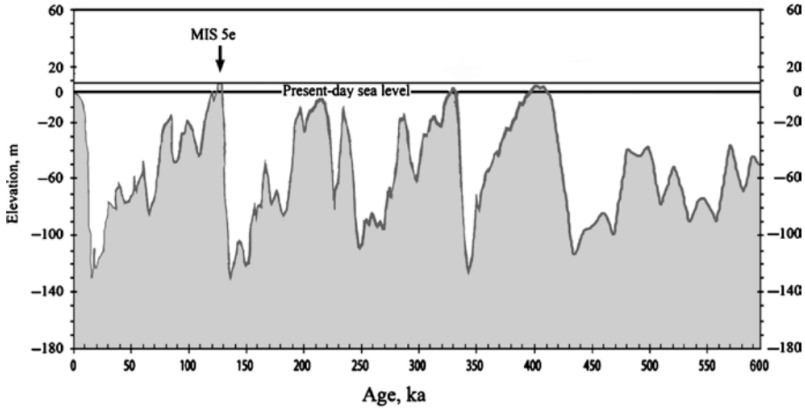

Figure 2: Global sea-level changes in the last 600 ka (kilo annum/thousands of years) thousands of year (Lichter et al., 2010).

The global level of the seas and oceans rose during the 20th century. These rises are almost certainly accelerated due to the natural variability of the climate and the human factor during the 21st century and beyond due to global warming and projected to rise by 60 cm by 2100 (IPCC, 2014), however the future extent of sea level remains uncertain (Nicholls & Cazenave, 2010).

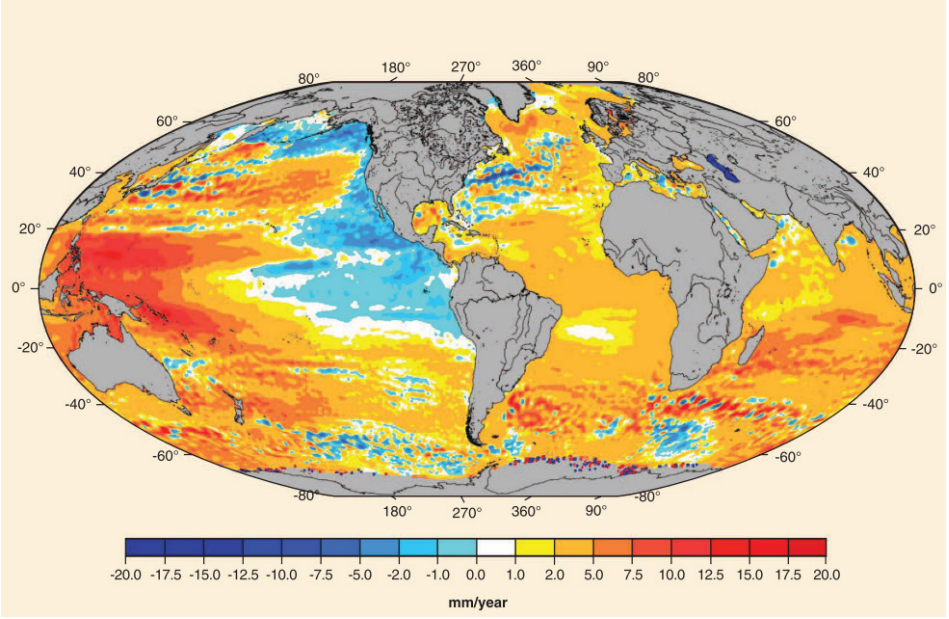

Figure 3: Regional sea-level trends from satellite altimetry in period of 1992-2009 (Nicholls & Cazenave, 2010)

During different measuring periods the sea level has been continuously raised up in the Mediterranean Sea region. From 1993-2012 founded significant trend of the mean sea level raise by 2.44±0.5 mm/year (Bonaduce, et al., 2016), while in period of 1993-1999 in Eastern Mediterranean the sea level has been raised up to 20 mm/yr. (Cazenave, et al., 2001). Although the impacts of sea-level rise are potentially large on coastal states, the application and success of adaptation are large uncertainties that require more assessment and consideration (Nicholls & Cazenave, 2010).

The direct and indirect impact of climate change will depend on how the world and nations will respond, for example the increased emissions and other aspects of climate change. The evidence indicates that climate change has already resulted in extreme weather events and sea level rises etc., with added threats to agricultural production in many parts of the world (Kompas et al., 2018).

Anthropogenic Contribution to Climate Change

There are many “anthropogenic” (human-induced) factors that contribute to climate change (IPCC, 2014) and climate change will affect human health in many ways-mostly adversely (McMichael et al., 2006). Today there is no doubt that humans contribute to the climate changes and the pressures on the ocean and its growing environmental issue all over the world (Halpern et al., 2015a). At the same time, it is important to understand that cyclical climate changes are always occurring on the earth, which called “normal” system behavior, and in this case deviations from the “normal” pattern indicate anthropogenic impact on the climate (Loehle, 2004). Based on Ice cores Geological analysis, there is good evidence that past human activity contribute to increase of greenhouse gases (CO_2 mainly) since the Industrial Revolution (Etheddge et al., 1996; Lüthi et al., 2008), while this increase promote higher temperature in the atmosphere (Scheffer, Brovkin, & Cox, 2006). However, the magnitude of human impact predicted by existing models remains very uncertain due to the accumulation of uncertainties (Scheffer et al., 2006). Both, natural processes and human activities change the Earth’s energy balance and physical factors, and for a complete understanding, both of these topics need to be explored (IPCC, 2014).

Quantifying and mapping local and global scale human impacts on the climate change in a standardized, comparable manner offers a powerful means to assess both the spatial pattern and temporal change of individual human impact, as well as their total impact on climate change across highly variable geographies (Halpern et al., 2015a, 2008). Today, assessing the level of anthropogenic impacts on climate change and on the environment is becoming one of the most important scientific topics in which there is still great uncertainty regarding the rate and changes of anthropogenic impacts. In the scientific community in general and in climate research, there is a sweeping consensus that the current rates of climate change is man-made.

Human presence in impact on the ocean is thought to be increasing globally (Fig. 4), yet we know little about their spatial and temporal patterns of cumulative change, which human activity is most responsible for changes in ocean environment and contribution to climate change, and which places are experiencing the greatest increases. Based on cumulative impacts of the result of the most impacting pressures of human activity: fishing, climate change, and land-based sources, nearly 66% of the ocean and 77% on national jurisdictions suffering from an increase of human pressure, while 5% of the ocean under heavily impact (Halpern et al., 2015b, 2008). To understand the real threats to maritime security and the challenges to policy-makers, it is not enough just to look at climate change. Climate change is only one component of the larger problem of direct, man-made environmental change (Paskal & House, 2007).

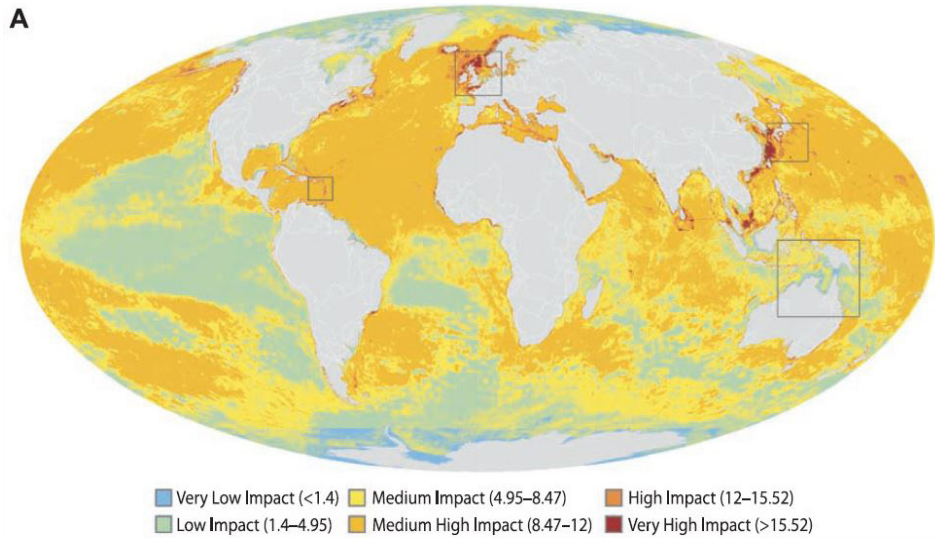

Figure 4: Global map of cumulative human impact (Halpern, 2008)

As a species, humans often make direct and indirect impact (Fig. 4) and major alterations to the environment (Halpern et al., 2008). In the more recent past, massive population increases have had a dramatic effect on global sustainability. At the turn of the 20th century, there were around 1.65 billion people on the planet. At the turn of the 21st, there were around 6 billion. The result is, more groundwater pumped up, more forests cut, more urban sprawl, more developments in flood plains, etc. and, ultimately, a changed environment (Paskal & House, 2007).

The current climate change, which does not distinguish between the state and other administrative boundaries, has created the need to develop new strategic approaches to overcome the consequences of these changes (Hannah, 2010). The declaration of an EEZ brings a series of challenges and concerns (Fig. 5) for large-scale collaboration efforts (Katsanevakis et al., 2015) economic and socio-political interactions between countries can significantly increase the stability and preparedness of each of the states in the prevention of the serious consequences of climate change.

Successful cross-border cooperation depends on achieving various environmental goals and strengthening economic ties and the necessary political cooperation (Levin, et al., 2018). However, there are obstacles to finding effective ways to collaborate. For example, partly due to a long-term lack of trust, many leaders around the world are suspicious of such initiatives, as an example of the West insisting on global emissions reductions. Some see this hypocrisy as a way to prevent economic growth in the

developing countries. In addition, some partners in the West are less likely than others to seek solutions. Most of both of these issues are related to the terminology currently in use, which is often confused or inaccurate and requires urgent clarification (Paskal & House, 2007).

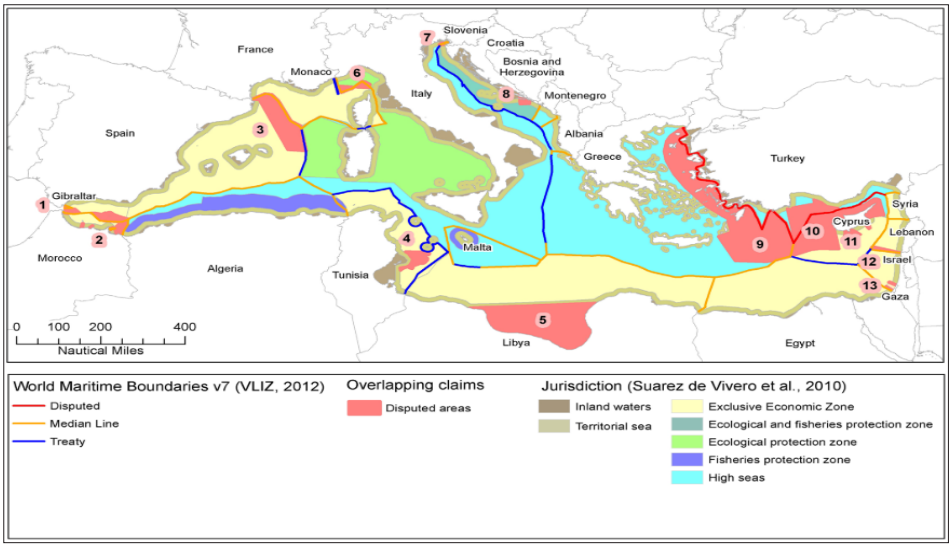

Figure 5: Marine boundaries and disputes in the Mediterranean Sea

Climate Change and Maritime Security

Maritime Security is one of the latest buzzwords of international relations (Bueger, 2015). Major actors in maritime policy, ocean governance and international security have in the past decade started to include maritime security in their mandate or reframed their work (Germond & Mazaris, 2019) in such terms, Israel is in the initial steps despite being an “geo-political island”. In last decade, the contribution of the maritime domain to Israel’s resilience and security continued to grow (HMS, 2018).

The raise of Maritime Security is happening now with climatic changes; therefore, a growing number of governments and non-state actors are beginning to adapt to the complex consequences of climate changes. As a result, new approaches are being developed that focus on maritime strategic thinking and an understanding of how climatic changes impacting now and when new climatic changes may affect maritime security and what results this may lead to, such as political tensions, armed conflicts etc. However, many countries do not have a national maritime strategy based on scientific conclusion about climatic changes and their potential impacts on national

maritime security (Bueger, 2015). In a global view, currently recorded a large number of cases where climate change interacts with diverse, complex and unstable social, political, economic and strategic situations, forcing them to a new type of problems to which in many cases, the state level has not developed any concept for solving such problems. Since climate changes occur “so fast” and in some cases are unpredictable, they alter the balance and “order of things” on which the security of nations is based (Germond & Mazaris, 2019). Today, such changes have taken an important role as powerful strategic forces that need to be fully understood. It is strongly influenced on international relations, future conflicts, wars etc. The initial effects of climate change vary depending on existing economic, political, and social structures in different regions of the world (Halden, 2007).

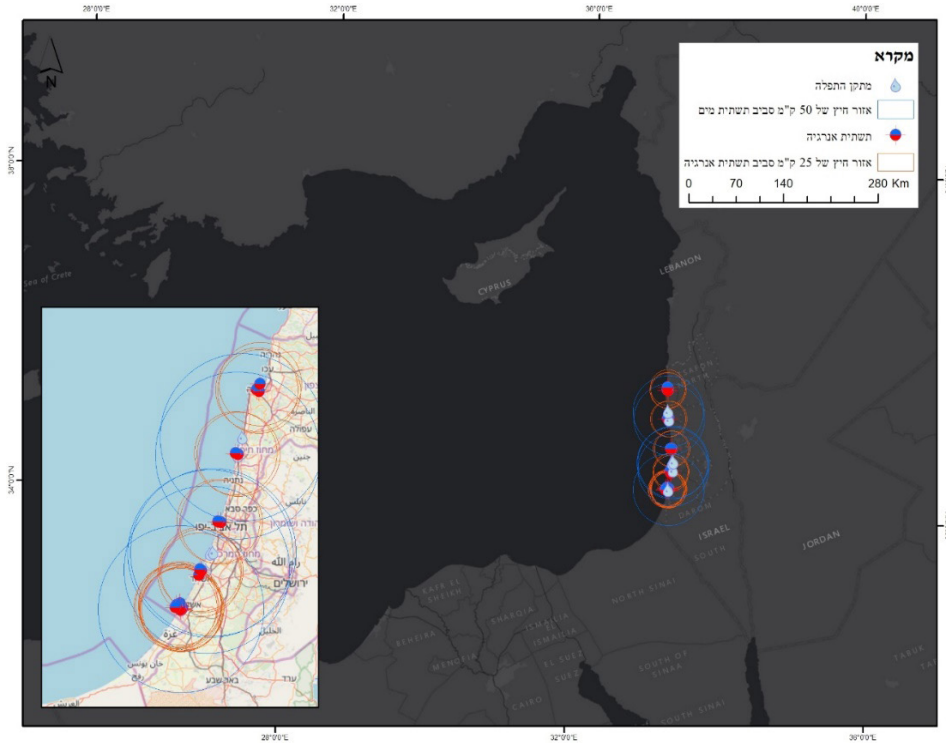

Figure 6: The location of important water and energy infrastructures along the coastlines of the Mediterranean coast of Israel with proposed buffer zones for monitoring and early detection of potential hazardous in the sea (50 km for water infrastructures and 25 km for energy). “Zoom in” map present location of buffer zones and territorial water (12 NM).

There is growing awareness that many important and critical aspects of Israeli maritime security are threatened or potential to be, by direct and indirect impacts of

climate change on marine and coastal ecosystems, maritime/coastal tourism, maritime transport, coastal communities and national infrastructure located along the coastline (Fig. 6). Therefore, the development of the Israeli marine geostrategy is required in the period of strong natural changes due to climate change and, apparently, is a new and modern way adopted by a growing number of other governments and non-state structures that at different levels assess and combat the impact of climate change due to for its potential difficult consequences.

Climate Change and Israeli Maritime Security

Israel is sensitive to the potential impacts of the unpredicted climatic and environmental changes due to its geographical and political location. Despite 190 km of Mediterranean Sea coastline with high number of national importance infrastructures (Fig. 6), densely populated, the potential impact of climate change on such infrastructure and population is poorly covered but is well known and is widely discussed.

Today, the most important component of climate change that affect or could potentially affect Israeli Maritime security as a result of the climate change are:

1. **Rainfall regime** – changes in the rainfall regime in Levant region, mainly decrease in annual quantity, seasonal distribution, intensity and timing (Zittis, 2018). This trend have major impacts on the country's water resources, which will increase the dependence on desalination plants. Trends in the duration of rain and dry periods during the rainy season also have important environmental consequences, especially for agriculture and ecosystems. For example, long dry periods can cause the soil to dry out, which means that more irrigation is required, while longer periods of rain can increase the risk of flooding (Ziv, et al., 2014). Few research indicated positive correlation between change in Israeli rainfall regime and increase of forest fires (Levin & Saaroni, 1999; Turco, et al., 2017) which also lead to increase off runoff (Wittenberg & Inbar, 2009). Such wildfires and post runoffs produce significant ecological and economic impacts that often go well beyond the traditional impact indicator.
2. **Sea level rise** – The rise in sea level in the Mediterranean during the 20th century was quite similar to the average global rise in sea level of 0.5–2.5 mm / year. This trend, however, has not been consistent throughout the course of the century. Few studies shows two completely different sea level trends over last century (Klein & Lichter, 2009; 2012 ,פרת & אלמגור). In addition to the unavoidable dangers associated with flooding the lowlands along coastal areas, sea level rise can also cause beach erosion, salt penetration into freshwater aquifers and other damage to the coastal environment (Lichter, et al., 2010). The expected economic impact

of maintaining the current level of operation of Israeli marine infrastructures along Mediterranean coastline as a result of sea- level rise is approximately US$200 million and US$500 million, for 0.5 m and 1 m sea-level rise, respectively (Zviely, et al., 2015).

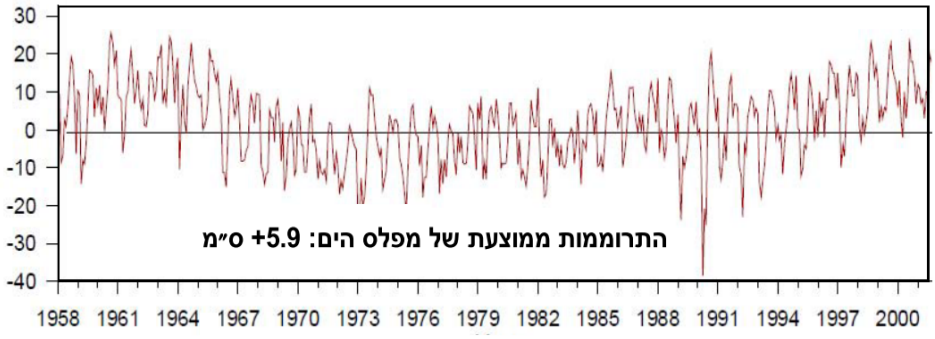

Figure 7: Sea level changes based on Jaffa and Ashdod tide gauge stations records 1958-2000. (אלמגור & פרת, 2012). Y axis in cm.

3. **Increase of sea surface temperature** – Several studies have shown that the surface temperature of the Mediterranean Sea has increased over the past 3 decades. In study of Pastor (2018), a consistent warming trend has been found for daily sea surface temperature data series derived from satellites (1982–2016) for the whole Mediterranean region and for different temporal scales, from daily to monthly, seasonal and decadal estimates (Pastor, et al., 2018). For instance, (Nykjaer, 2009) in a study covering the period 1985-2006 noticed that sea surface temperature in upper layer has been increasing at an average rate of 0.03±0.008 C yr^{-1} for the western basin and 0.05±0.009 C yr^{-1} for eastern basin. Additional study (Shaltout & Omstedt, 2014) covering the period of 1982-2012 founded similar average SST by 0.035±0.0070 C yr^{-1}. The Levantine sub-basin is initially warmer and current warming process at a much higher rate compared to the entire Mediterranean Sea (Pastor, et al., 2018; Shaltout & Omstedt, 2014). Such increase of SST and marine heatwaves (Jacox, 2012) significantly impact on marine biota (Marbà, et al., 2015) and seagrasses and microalgae that playing important role in marine ecology (Koch, et al., 2013) in Levant region.
4. **Increase of air temperature** – Israeli summers are getting warmer and winters are colder. The increase in the summer minimum temperature is more pronounced than the increase in maximum temperature, while the decrease in maximum temperature in winter is greater than the decrease in minimum. The result of these changes is a decrease in the daily range of air temperature in both seasons (Ben-

Gai, et al., 1999). Such temperature increase and change in daily range potentially could lead width range of impact on human health (IPCC, 2014, 2018). A popular and one of the most famous examples of such changes in the temperature regime is the European summer of 2003 with average temperature 3.50 C above normal, caused the death of approximately 22,000 to 45,000 over two weeks (International Federation of Red Cross and Red Crescent Societies, 2004). However, in some cases, the relationship between temperature and the development of contagious diseases, human migration, local land use changes is not strongly correlated, although in some cases a positive relationship is found (Patz, et al., 2005).

5. **Impact on GDP** - Global warming with no state action will led to decrease of GDP. There have been relatively few attempts to examine the full global, disaggregated, and intertemporal effects of climate change on GDP using large-scale economic modeling. Based on large-scale economic model is fully disaggregated with forward-looking behavior, spanning across 139 countries and 57 broad commodity groups, with full computational convergence over a period of 200 years (See table 1 and 2). As a numerical modeling, this model shows the potential economic benefits of following the Paris Climate Agreement (Kompas et al., 2018)

Table 1: Impacts of Global Warming (3◦C) of neighboring countries of Israel on the World GDP (%Change/Year) (Kompas et al., 2018).

Year	Saudi Arabia	Egypt	Israel	Iran	Jordan	Greece	Cyprus	Turkey
2027	−0.378	−0.354	−0.198	−0.167	−0.158	0.108	0.025	0.007
2037	−0.831	−0.714	−0.410	−0.350	−0.342	0.2	0.042	−0.008
2047	−1.332	−1.086	−0.632	−0.558	−0.555	0.281	0.049	−0.045
2067	−2.422	−1.867	−1.102	−1.047	−1.052	0.402	0.024	−0.180

Table 2: Long-Run Impacts of Climate Change Scenarios of neighboring countries of Israel on the World GDP (%Change/Year) (Kompas et al., 2018).

Country	Saudi Arabia	Egypt	Jordan	Iran	Israel	Turkey	Cyprus	Greece
10C	−1.650	−1.083	−0.982	−0.894	−0.743	−0.342	−0.194	−0.048
20C	−3.457	−2.377	−1.998	−2.044	−1.514	−0.842	−0.462	−0.149
30C	−5.449	−4.000	−3.254	−3.516	−2.317	−1.540	−0.816	−0.275
40C	−7.773	−6.143	−4.835	−5.365	−3.416	−2.479	−1.481	−0.708

These and other effects of climate change are having a serious and ongoing impact on Israel's maritime security through aspects such as the water sector, agriculture, health, biodiversity, coastal and urban environments, in addition to their geostrategic and environmental and social impacts. In 2009, Israel's government prepared a national

climate change policy and action plan that include both mitigation and adaptation measures. In the wake of the decision, an Israeli Climate Change Information Center (ICCIC) was set up by the Ministry of Environmental Protection in 2011 to compile the existing knowledge in Israel and abroad, to identify knowledge gaps, and to submit recommendations to the government on national and local adaptation measures. Based on the findings, developed recommendations on a climate change adaptation plan for Israel, on both the national and local levels (ICCIC, 2014). In light of the high importance of the sea to the state of Israel, the development of a similar plan is required that will cover the vital aspects of maritime security in Israel and provide a clear plan of action at the state level.

Conclusions and Recommendations

This paper gained feed official strategic documents, which aim to increase awareness but also propose and apply management and mitigation measures towards reducing risks for Israeli Maritime Security. Climate change will also hit neighboring countries, some of which have little ability to cope with these problems due to development and governance difficulties. Israel must also be prepared in this context, such as:

1. Climate refugees
2. Marine pollution originating outside the waters of Israel.
3. Agriculture degradation and political instability

Under this context, the potential socio-economic, environmental and health impacts at local, regional and global scales should receive considerable attention by Israeli decision makers based on scientist findings. There is a consensus on the need to deepen the understanding of the links between climate change effects and threats to maritime security and human health, but it remains to be seen how existing knowledge on the interplay between climate change and maritime security should be translated into Maritime Geostrategy of Israel.

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Tsunami in the Mediterranean

Dov Raz

Introduction

The concentration of Israel's population and critical infrastructures (electricity production, desalinization, etc.) along its coast, together with the history of earthquakes in the Eastern Mediterranean, increase the risk of severe damage from a tsunami.

A tsunami, or "harbor wave" in Japanese, is one the most unpredictable and destructive natural phenomenon in the world. The shocking scenes in the aftermath of recent tsunamis in India (2004), Indonesia (2004, 2018) and Japan (2011), which are burned into our memories, cost thousands of lives and caused massive destruction to coastal cities and infrastructure.

The goal of this chapter is briefly surveying the theoretical background and causes of a tsunami, the regional history of tsunamis and the potential for damage to the State of Israel as a result of a major tsunami. It also examines what actions can be taken in order to improve Israel's readiness for a tsunami.

Theoretical background

Like any wave, a tsunami is essentially a disturbance of energy moving through the water. In the case of ocean waves, which are known as "wind waves" because it is the wind that moves the water, the energy of the wave moves through the upper layer of the water only, that which is influenced by the wind. The accumulated energy in wind waves is influenced by three parameters: the wind's fetch, duration and strength. Also, in the case of swells, which are essentially distant "remnants" of wind waves after the wind has died down, the energy travels only in the upper layer of the water. In contrast to these waves, the energy of a tsunami wave is created as the result of a sudden and violent disruption and it travels in the water at depths of sometime hundreds and even thousands of meters. The length of a tsunami can reach hundreds of kilometers and its wave frequency can be tens of minutes. The speed of the wave is enormous and can reach hundreds of kilometers per hour. However, in the open sea its influence is almost negligible, as it reaches a height of only a few dozen centimeters in most cases and therefore is almost undetectable. These physical characteristics are what makes the tsunami so destructive (Salamon et al., 2014).

There are a variety of factors that can lead to the creation of a tsunami. The main one is a major earthquake, whose epicenter is located in the ocean. The second most

common reason is a landslide on the continental shelf, whether it is caused by nature or by man. Other much less common causes are undersea volcanic eruptions, nuclear explosions, sliding icebergs and even a meteor crashing (Salamon et al., 2014).

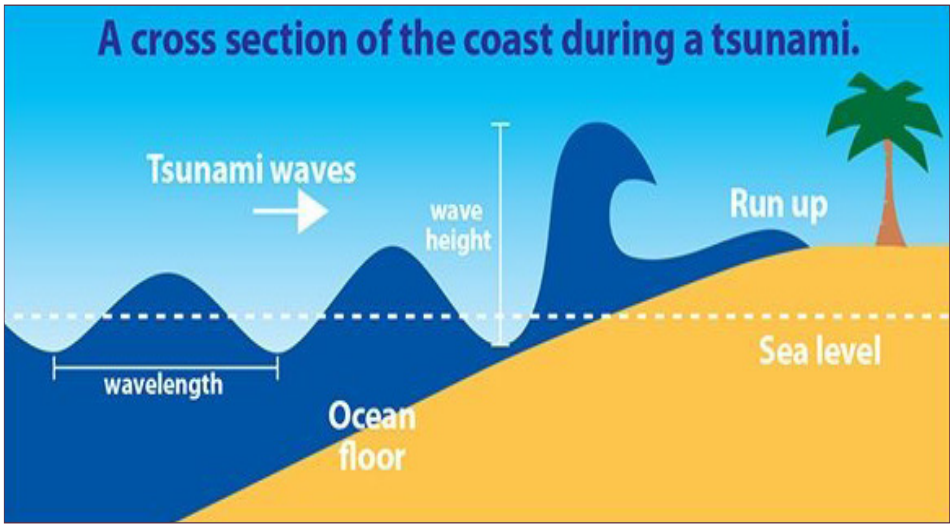

Figure 1: Illustration of a tsunami hitting the shore

The basic traits of a wave that make it so destructive when it hits land are the wave's speed and the fact that the energy is accumulated over the entire height of the water column. As the wave approaches land (Figure 1), the water becomes increasingly shallow and as a result the speed of the wave is accelerated to several meters per second and its length narrows to several dozen kilometers. The energy, which is preserved according to the Law of Conservation of Energy, starts to "push" the water upward to a height that can reach several meters. The intensity of the damage and the extent of flooding as a result of the wave is dependent on its power, on the gradient of the shore and on the topography of the shore (steep/flat) (Salamon et al., 2014).

In general, the contact with the shore initiates a rapid drawback of the water, which is reported often as a "disappearance of the water". The waterline can withdraw dozens of meters in some cases, followed by a high tide that rises the waterline significantly, creating an inundation that sweeps away everything in its path, depending on the characteristics of the wave and the shore. In rare cases and under certain shore conditions, the waves created can break at a height of several dozen meters. There can be a succession of waves that lasts hours or even a full day, during which there is flooding and then retreat of the water every few hours (Salamon et al., 2014).

Characteristics of a tsunami created by an earthquake

As mentioned, the most common cause of a tsunami is an earthquake. The movement of the earth's tectonic plates "pushes" the water upward (Figure 2) which causes the wave to propagate at 360 degrees perpendicular to the longitudinal axis of the earthquake. In such a scenario, the characteristics of the wave are the classic ones described above – a wave length of up to hundreds of kilometers and a frequency of several dozen minutes. These characteristics lead to the diffusion of energy over a very large area and therefore the force with which it hits the beach will be uniform and characterize by long wave lengths (Salamon et al. 2014).

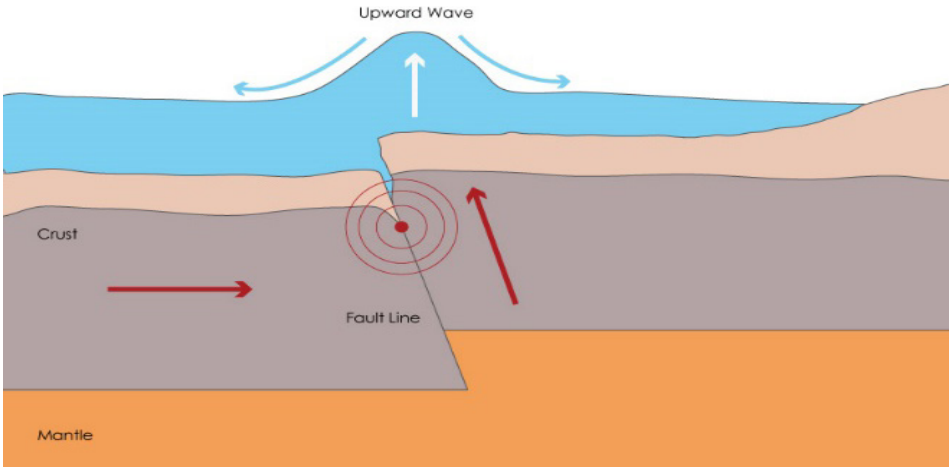

Figure 2: Creation of a tsunami by an earthquake

Characteristics of a tsunami as the result of a landslide

In the event of a landslide, the characteristics of the wave are somewhat different. The force of the wave (Figure 3) is dependent on the width, the volume and the speed of the landslide. This is a localized source of energy that moves along the seabed on a slope along a front of several hundred meters and therefore the greatest force is created along the landslide's axis of movement and diminishes laterally from the source of the landslide. A wave caused by a landslide is shorter in length than one caused by an earthquake (Salamon et al., 2014).

The expected damage from a tsunami

The immediate and most visible damage is of course the flooding on dry land, but that is not the only type of damage and other secondary phenomena are liable to cause

serious damage to infrastructures along the coast. In the case of a large wave that starts close to the shore, the speed and flow of the water can reach a speed of 3–5 meters per second (Figure 4). The speed of the water alone can cause serious damage to buildings, infrastructure, movable property, etc. The sweeping away of movable objects (vehicles, garbage, boats, etc.) which are then smashed against buildings and structures can cause serious damage to infrastructure, beyond the direct damage to the objects themselves.

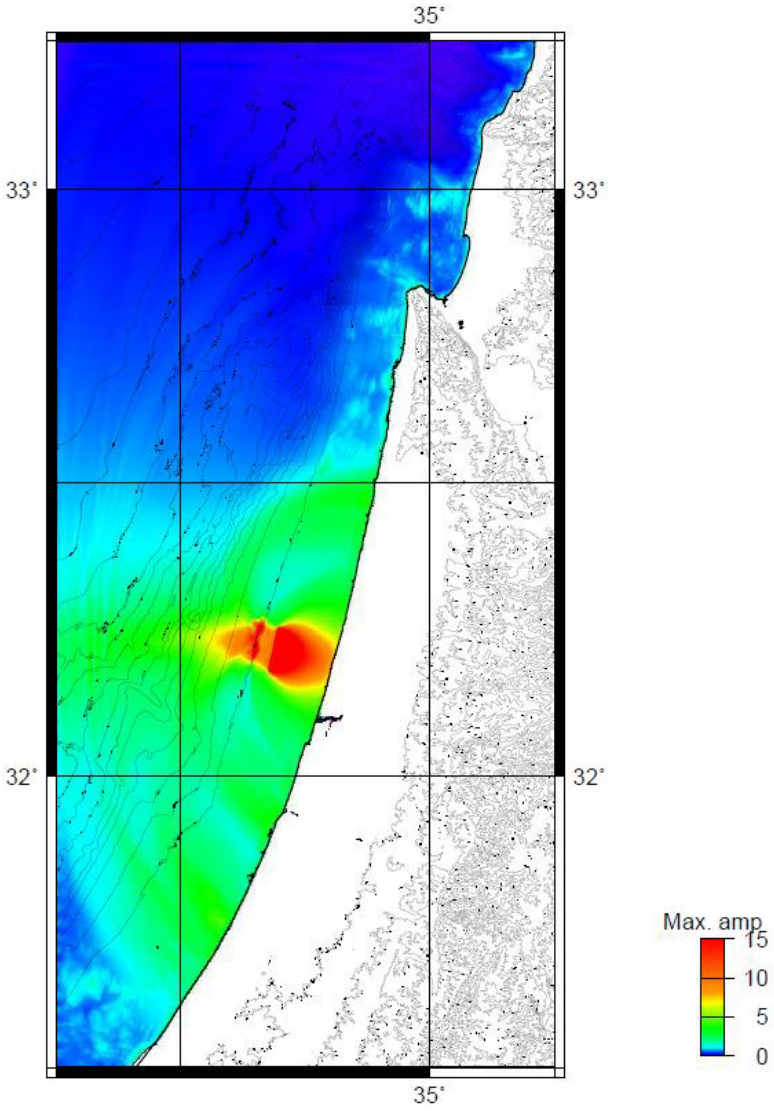

Figure 3: Depiction of a tsunami's force as a result of a landslide (Salamon et al., 2014).

There are other phenomena which are caused by the drawback that occurs prior to the flooding of the tsunami. The drawback of the water is liable to endanger harbors due to the sharp drop in the water level, which in turn leads to a lowering of the float level of any ship moored in the harbor that can cause damage to the harbor infrastructure as the result of broken moorings, damage to the piers or the smashing of vessels weighing hundreds of thousands of tons against the piers. There are a number of types of shore facilities that pump in seawater, such as power plants and desalinization plants, which are liable to be exposed to an interruption of intake due to the drop in the water level. Such an event can lead to serious damage and even to the complete destruction of the pumps and other systems, such as turbines for electricity production, desalinization equipment, etc.

Secondary phenomena that can cause long-term damage are the possible seeping of seawater into the groundwater, thus raising its salinity. In addition, the morphology of the coast is liable to change beyond recognition as a result of the shifting of large amounts of sand from dry land in the direction of the sea.

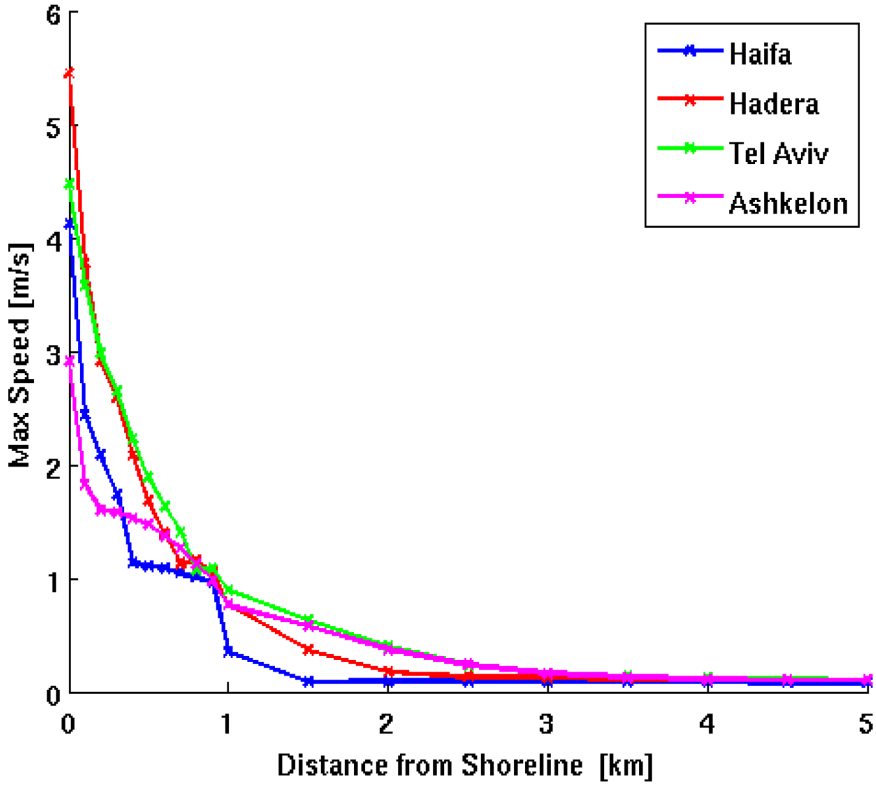

Figure 4: The predicted speed of flow (Galanti, Rosen and Salamon, 2009)

Historical background

The historical record shows that tsunamis have definitely occurred in the eastern Mediterranean. Figure 5 shows the tsunami events in this region during the past several millennia as a result of earthquakes (brown arrow) and as a result of landslides (yellow shading). As can be seen, most of the events that were caused by an earthquake had their source in the Hellenic arc that surrounds Crete and the eastern shore of Greece (Salamon et al., 2009).

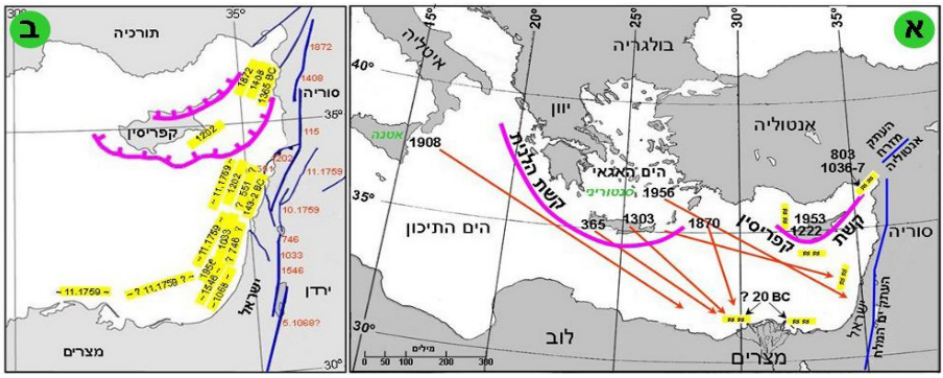

Figure 5: Tsunami events in the eastern Mediterranean (Almagor and Perath, 2012)

These events were analyzed by Salamon and other researchers (Salamon et al., 2009) based on both the historical record and geological and archaeological findings that testify to tsunami events. The analysis shows that tsunami events on Israel's coast occur in average every 200 years and once every 800 to 1000 years there is a large-scale tsunami. In about one-third of the events, there is documentation of damage to port cities and in another third there is documentation of loss of life (Salamon, 2009; Pareschi, Boschi and Favalli, 2007).

There are two events that occurred in Israel for which the documentation includes quantitative data and they can be used as historical references. The first occurred in 1759 and was apparently the result of an earthquake with an intensity of ~6.6 and whose source was in the area of Lebanon and northern Israel. According to the historical record, "the water rose to a height of 2.5 meters in the streets of Acre." However, it doesn't say where the measurement was taken and therefore it is difficult to ascertain the intensity of the wave. The second event was a wave that occurred in 1956 following an earthquake with an intensity of ~7.2, whose epicenter was in the Aegean Sea. It is unclear whether the wave was created as a direct result of the main earthquake or as a result of secondary shocks that occurred 13 minutes later. One way or another, there

are researchers who have found evidence of the tsunami in Haifa Bay, but the main documentation comes from the records of water level in the port of Jaffa. The records shows a rise of 28 cm above the common water level, at intervals of 12–15 minutes and for a duration of more than 24 hours following the earthquake (Beisel et al., 2009; Salamon et al., 2009).

The potential damage from a tsunami in Israel

Before discussing the potential damage from a tsunami in Israel, it is worthwhile first discussing when and in what circumstances a tsunami can arise. According to various studies that have been done, there are a number of threshold conditions for the creation of a tsunami on the coast of Israel. The studies looked at scenarios of both an earthquake and a landslide.

An earthquake with the potential to create a tsunami needs to occur in the southeast portion of the Hellenic arc, and with an intensity of 7 or more on the Richter scale. In addition, the epicenter must be relatively shallow – up to a depth of 100 km below sea level. According to the historical record, it is estimated that at least two of these types of events have occurred with an intensity of 8 or more and with a frequency of once in 800–1000 years. Landslides must occur on the continental shelf or in the Nile Delta and the epicenter must be less than 100 km from the coast and with an intensity of 6 or more. The historical record shows that 8 such events are known of, with a frequency of once every 250 years.

Two reports by Israel Oceanographic and Limnological Research (Galanti, Salamon and Golan 2014; Galanti, Rosen and Salamon, 2009) analyzed the potential damage to infrastructure along Israel's coast. The extent of damage is of course dependent on the force of the tsunami, the coastline, the situation of the sea at the time of the event, the time of day and other parameters. Since the evidence of past events does not provide sufficient quantitate data, the analysis was based on computer models. The baseline event is based on a tsunami that occurred in 1303, in which an earthquake with a force of approximately 8 in the vicinity of the Hellenic arc caused a broad tsunami in the eastern Mediterranean. Although the researchers did not carry out a full analysis of the damage over the entire coast, they did consider a number of areas of particular importance, such as heavily populated areas, important infrastructure facilities, important maritime facilities (such as the natural gas platforms in the South), etc.

As can be seen in Figure 6, the predicted flooding in the Tel Aviv area is quite extensive. The water level is expected to rise in certain areas up to a maximum of ten meters and to inundate large areas. In Yarkon Park, which is relatively low, and near the mouth of

the river (including the area of the Reading power plant), particularly extensive flooding is expected. In addition to the predicted damage in the Tel Aviv area, the reports predict additional potential damage. For example, in Hadera a cumulative rise and fall in the water level of about 10 meters is expected at the coal pier and a force of tens of tons is expected on its pillars as a result of the expected speed of the water's flow. In addition, severe damage is expected to the intake pipes of power plants and desalination plants due to the drawback/flooding and the sweeping away of movable objects and refuse which may result in the interruption of operations and destruction of the plants.

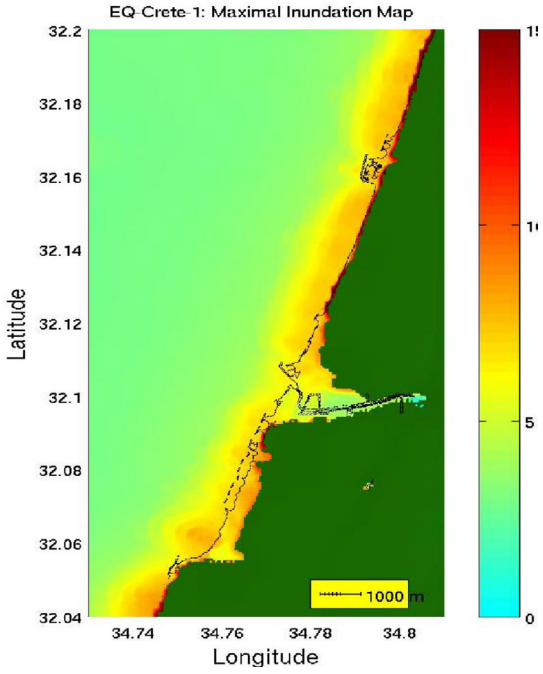

Figure 6: Predicted extent of flooding in the Tel Aviv area (Salamon et al., 2014).

Preparedness for a tsunami in Israel

Preparations in Israel began following a government decision in 2012 to take steps on a national level in order to prepare for a tsunami.[1] The decision primarily concerned the establishment of a national warning center, the *Nachshol Nitzpe* (observed surge), and creation of an ability to provide a warning in real time of a tsunami in the designated areas

1 Government Decision 4738 on June 7th, 2012: "The creation of a national earthquake and tsunami short-term warning system (the *Truah* and *Mayim Adirim* systems)" and at a later stage Amendment 5371 on February 20th, 2013.

using the *Mayim Adirim* (great water) warning system. The purpose of the center is to bring together all of the necessary components needed for the rapid identification and analysis of earthquakes, with the goal of evaluating in real time the level of danger from a tsunami and conveying the information and the warning by means of various media. It is important to mention that the center must deal with a relatively high level of uncertainty since a warning with a high level of confidence can be issued only after measurement of the water level and of parameters that provide evidence of an approaching tsunami. As a result, the plan calls for connecting the center to international warning systems and to establish cooperation and collaboration with various Mediterranean countries. The expected warning time for local earthquakes is only a few minutes and up to two hours for more distant events. Similarly, clear parameters have been set and according to the seismological data of the event a decision will be made as to the type of warning to issue (prepare/activate) and at what level of confidence (Salamon et al., 2014). Some of the preparedness is carried out at the municipal level and in recent years warning signs have been erected in some of the coastal cities (Figure 7) which are intended to mark areas of high tsunami risk and the route by which to escape.

Figure 7: Guidance signs for Tsunami event at the coastal zone of Haifa

In spite of the fact that the discussion of the government decision occurred in 2012 and that a period of three years was allocated to establish the warning system, the contract to build the center and install the warning systems was only signed in 2017 and work

is currently expected to be completed by 2020. A report of the Knesset Information Center in 2017 stated that the level of preparedness of the local authorities is still low (Yachimovitch-Cohen, 2017).

Summary and conclusions

It appears that the occurrence of a major tsunami in the eastern Mediterranean is just a matter of time. The danger is amplified by the fact that the frequency of a major tsunami is once every 800 to 1000 years and the last one occurred in 1303. The geographic structure of the State of Israel and the concentration of infrastructure and population along its coast line, increases the potential damage to the point where it may take years for the country to recover from such event. The government decision on this issue which set 2016 as the target for the establishment of a warning center is being carried out at a snail's pace and the center does not yet exist.

Following are the components that are currently lacking in the State's preparedness for a large-scale tsunami:

1. **Raising the level of awareness among the population** – Most residents of Israel are unaware of the signs that have been placed on the beaches, the danger of a tsunami and what they should do in response to a warning.
2. **Implementation of the government decision** – There are gaps between the decision and the pace of implementation and also the domains to which the decision relates.
3. **Dealing with specific infrastructures** – A more in-depth analysis is needed of the possible extent of damage to essential infrastructures and in particular what can be done in order to prevent the damage or at least minimize it.
4. **Procedures for operating/shutting down essential facilities in an event** – If the emergency shutdown of facilities can save some of the infrastructure, then procedures for carrying that out are needed.

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The SAAR[1] Missile Boats: The Israel Navy's Surface Warships

Eli Rahav[2]

Introduction

This year marked the 50th anniversary of the extrication of the five Cherbourg ships. The extrication of the ships from France was the final stage of the Israeli Navy's acquisition of 12 SAAR missile boats. The transition from a navy built on 3 destroyers[3] and few old torpedo boats to a navy of small and fast boats armed with Gabriel sea-to-sea missiles represented a major change in the Navy's strategic thinking. That change proved itself in sea battles during the Yom Kippur War in 1973.

The marking of the 50th anniversary of the arrival of the Cherbourg boats in Israel is an opportunity to take a historical perspective on the current buildup of the Navy, namely the acquisition of four MAGEN (protector) ships which are currently being built in Germany and are based on the Braunschweig-class corvette. The MAGEN ships represent the largest investment ever made in surface warfare by the Israeli Navy.

This article will carry out a comparison of the considerations and decisions that led to the abandonment of small and fast SAAR missile boats and the adoption of the new MAGEN ships. This choice to use a few slow, large and expensive vessels stands in contrast to the strategy of the Navy since the 1960s, which was based on a larger number of small and fast vessels with versatile capabilities. (The article will not discuss the submarine fleet).

The article begins with a historical survey of the change in the Navy's strategy, which led to the acquisition of the SAAR missile boats during the 1960s and 1970s, and a description of the absorption and successful operation of the missile boats in the Yom Kippur War. The article will then describe the acquisition of the MAGEN corvettes, the threats they are meant to deal with and a comparison of the MAGEN corvettes to the SAAR missile boats.

Choosing the large and slow German corvette as the Navy's new ship (known as the MAGEN or SAAR 6 class) represents a missed opportunity to upgrade Israel's naval power, to reduce the size of its navy and to support local industry, namely Israel Shipyards – the natural choice for producing ships for the Navy.

1 SAAR (Hebrew): Attack, assault, storming

2 Rear Admiral (ret.) Eli Rahav served in the Israeli Navy from 1958 to 1985. His last position was Head of the Sea Department in the IN staff.

3 During that period, there were three destroyers in the Navy: INS Eilat, INS Yaffo and INS Haifa.

Historical background

The decision to equip the Navy with missile boats: New Destroyers versus SAAR Attack Craft

Admiral Yohai Ben-Nun became commander of the Navy in 1960. Based on personal experience, he was aware of the inferior capabilities of the Navy during that period. During the War of Independence (1948), he had sunk the enemy ship El-Amir Farouk and understood how precarious for a light explosive boat to get into attack position against a speeding target. As commander of the destroyer INS Yaffo during the Sinai Campaign in 1956, during which the Egyptian destroyer Ibrahim El-Awal was captured, he had observed the ineffective battle of cannons, in which Israeli destroyers had fired hundreds of shells and had scored very few hits on the target. It was clear to him that the destroyers serving in the Israeli Navy were an inferior platform and that the Israeli Navy is in need of a different type of vessel.

In 1960, once he become commander of the Navy, Ben-Nun instated several weekly meetings of the senior naval staff in order to brainstorm.[4] The team concluded that it is necessary to create a new type of naval power that will facilitate offensive maritime initiatives, rather than making do with mere coastal defense. However, the naval force would need to be such that the State of Israel could afford its construction and operation.

Figure 1: The *Skori* destroyer

The main threat to Israel's security in the maritime domain was the Soviet-produced *Skori* destroyers, operated by Egypt. The Israeli Navy's three British-made destroyers were inferior to the *Skori* destroyers, and the Navy was looking for a response to that threat. The torpedo boats, the Navy's other type of vessel, were effective as fast gunships against small targets. The use of a torpedo, however, requires getting

4 Yitzhak Shushan, *The Eilat Destroyer*, p. 145.

relatively close to the enemy, which made the torpedo boats vulnerable and inferior when dealing with the *Skori* destroyers.

The plan to upgrade the Navy initiated by Admiral Ben Nun was unique in that it departed from the conventions of maritime warfare by achieving technical advantage of a single warship. By making do with smaller ships and given the acquisition budget of the Navy, it was possible to acquire a large number of warships.

In March 1960, Prime Minister David Ben Gurion met with Konrad Adenauer of West Germany in New York. Ben-Nun leveraged his ties with then aide to the prime minister Shimon Peres to introduce a paragraph into the new aid agreement between Israel and Germany —after the reparations agreement had expired—which specified the delivery of six new torpedo boats to Israel.[5] When Ben-Nun formulated the request for these new ships, it is doubtful that he already knew with what lethal weapons they would be armed. There were suggestions at that time for an advanced homing torpedo named Karish, which were never implemented. At that time, planning began in secret for the development of the Gabriel sea-to-sea missile, which was based on the Luz missile that had been developed for the Artillery Corps by Rafael and later together with Israel Aircraft Industries. The planned range of the Gabriel missile was 20 kilometers, somewhat longer than the maximal range of the *Skori's* guns (note that this was prior to the Czech deal in which the Egyptians and Syrians acquired the Soviet Styx missiles that had a range of about 80 kilometers.)

In January 1963, Commander Ben-Nun presented the outline of the Navy's acquisition to the General Headquarters, commanded by the Chief of the General Staff Zvi Tsur. It was based on the SAAR missile boat and Ben-Nun's presentation of the project included the following:

> "The Navy has fully exploited the potential of its existing vessels for solving the problems in the maritime arena…What is needed is a Navy that can achieve its primary mission using the fastest and cheapest way of destroying the enemy's navy during the initial days of fighting and will have the capacity to fulfill most of the tasks required of it by the General Staff in an all-out war, in a limited engagement and in routine security tasks. The solutions lie in a change in thinking and in the development of superior weaponry that will allow carrying out the new strategy. The weaponry required consists of missile boats and submarines that will replace the destroyers and torpedo boats."[6]

5 Abraham Rabinowitch, *The Cherbourg Boats*, p. 45.

6 Shia Ben Nun and Dita Grey (eds.), "*The time Took Us*", Ministry of Defense, pp. 116-118. [Hebrew] "The statement by Admiral Yohai Ben-Nun during the General Staff discussion, January 1963, in which it was decided to approve the Saar boats project."

In the discussion at the General Staff Headquarters, Chief of the General Staff Zvi Tsur approved the Navy's proposed missile boat project. It was decided that the Navy's main force would be based on a single class of fast, small and relatively inexpensive boats that would provide the Navy with the following advantages:

- **The vessel** would have the ability to engage with both destroyers and missile boats, and thanks to its high speed it would also dictate the terms of the battle. The vessel would be operationally independent as a single ship or as part of a task force.
- **Armaments** – The vessel would be armed with guided missiles and automatic dual-purpose radar-guided cannons. The ratio of cannons to missiles would vary according to the nature of the mission and various combinations of weaponry would be available in assembling task forces.
- **Speed** – The vessel would be faster than any existing ship in the arena or any ship that might be deployed in the reasonable future. The maximum speed would be at least 40 knots.
- **Mobility and range** – The vessel's operating range would be about 1000 nautical miles at a speed of 30 knots, which would allow it to be transferred quickly from one area to another and would allow the concentration of force at a decisive point. Such operating range was sufficient for missions in the Eastern Mediterranean arena. Essentially, its operating range span across the eastern quarter of the Mediterranean, which includes the coast of Syria, most of the Egyptian coast and the waters up to Crete, Greece.
- **Resilience** – The vessel would be able to maneuver in rough seas and to operate its weapon systems in seas up to a strength of 5 Beaufort scale
- **The acquisition process** – The buildup would be gradual and continuous, in line with budget constraints. Following the introduction of the first 6 vessels that would be built abroad, the Navy will consider transitioning to construction to Israel.[7]

"**The Navy sets out for the open seas**" – In 1963, while I was a commander of a torpedo boat in Eilat, we had the privilege of a visit by Admiral Yohai Ben-Nun, the commander of the Navy, during an assembly of officers at the Eilat Navy base. He stated that "the Navy is setting out for the open seas with a large number of fast boats carrying deadly weaponry." In view of the disbelief his words were greeted with, he added "several dozen of them" (Eli Rahav).

Implementation of the plan to acquire a missile boat force

As mentioned, in the early 1960s the Navy did not have the capacity necessary to carry out its missions in the maritime domain. Thus, it needed to upgrade its force as quickly

7 Shlomo Erell, "*Facing the Sea*", The Story of a Fighting Sailor and Commander. p. 215.

as possible. In order to keep costs low and to shorten the timetable for introducing the new vessels, it was decided not to develop a new type of ship and build a prototype for quality testing, as was customary in other navies. Rather, an existing boat with proven operational track record at sea would be chosen, and the new vessel would be built based on such principle design at minimal cost.

It was decided to build upon the successful Jaguar torpedo boat of the German Navy, which best met the required specifications. The engineers at Lürssen, a German shipbuilding company, modified the planning of the body of the original torpedo boat in order to switch from wood to steel and lengthened it by about 3 meters. The construction within Lurssen shipyard had stopped by order of the German government due to pressure by the Arab countries. An alternative was found at the Cherbourg shipyard in France where 12 ships were built, in two batches of six each. The French embargo on the sale of weapons to Israel following the Six Day War led to a freeze in the delivery of the last five boats, which were extricated out of Cherbourg on Christmas Eve 1969. The ships built in Cherbourg were named the SAAR missile boats and were divided into SAAR-1 class, SAAR-2 class and SAAR-3 class (see below).

In parallel to the construction of the boats at Cherbourg and following the capture of Sinai and the opening of the Straits of Tiran in the Six Day War, Defense Minister Moshe Dayan ordered an assessment of the importance of the Red Sea, which directed that the SAAR missile boats be deployed there in order to ensure passage through it. Shlomo Erell, the commander of the Navy at the time, explained that the nature of the Red Sea, the distances to potential points of conflict and fact that its shores are controlled by enemy states requires the use of larger ships.[8] As a result, six larger SAAR 4 class ships were ordered, this time from Israel Shipyards and based on Lürssen's design. Thus, the wish for domestic construction of boats was fulfilled.[9]

These SAAR 4 boats were built with the capability of carrying eight Gavriel missiles and two 76mm cannons, based on lessons learned from past experience. The propulsion system was identical to the previous models. The cruising speed remained 30 knots, but the maximum speed was only 35 knots as opposed to 40 knots of the initial SAARs.

Moshe Dayan’s vision for the Red Sea, which was contested by the Chief of the General Staff Haim Bar-Lev, was essential to clearing the path for technological progress and growth in Israel’s naval forces.

8 Shlomo Erell, ibid., p. 283.

9 Shlomo Erell, ibid., p. 287.

Figure 2: Gabriel missile launch from SAAR 4 ship

Development of the SAAR boats' battle Doctrine

The war fighting capability of the missile boats required a fundamental change in the Navy's strategy. Hadar Kimchi, the commander of the missile boat fleet, initiated and formalized a comprehensive new tactical doctrine, based on cooperation between units, stealth, deception and high speed assault. Commencing with missile fire and completion with cannon fire. Training the weapons systems could be done using simulation (an innovation at the time), such that repeated training exercises were possible without actually firing a 'live' missile. A tactical training simulator was built at the Navy's training base in Haifa and the boats' crews trained for combat, both near the coast and out at sea.

By the time the SAAR boats went into service, the Arab navies had acquired ships armed with the Styx missile. The Egyptian navy had actually used the missile to sink the Israeli destroyer INS Eilat in 1967 and the fishing boat Orit in 1970. The range of the Styx missile was double that of the Gabriel, which put into question the ability of the SAAR boats to defeat the enemy's navies.

Despite the difference in ranges, Adm. Avraham Botser, then commander of the Navy, decided to acquire the shorter-ranged Gabriel missiles rather than wait for the development of a longer-range missile. The Navy's electronic engineers developed innovative solutions for the deception of incoming missiles. They developed chaff

rockets that would mislead the radar of enemy ships. The SAAR boats' battle doctrine and training exercises were carried out in order to achieve close cooperation with the Israeli Air Force for air attacks while the boats were closing the missile range gap with full speed.

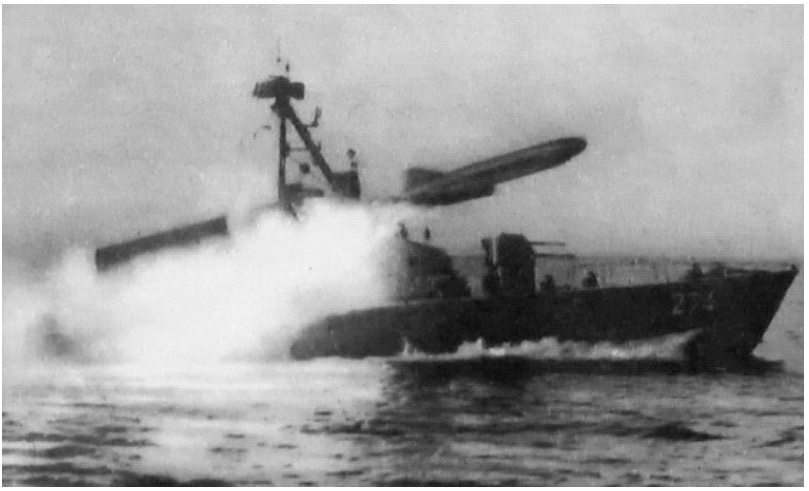

Figure 3: Komar class ship launching a styx missile

The intention to introduce the fast attack craft in short time, precluded the possibility of testing a prototype. The boats were produced simultaneously with their weapon development, and quality control was less than optimal. This was reflected in technical malfunctions, at times even during battle. It is worth mentioning that the problems with the propellers and the motors were fixed, and the malfunctions of the first batch of 76 mm guns were almost completely corrected in the second batch of the guns production that was installed on the SAAR 4 missile boats, in addition to the improvement in the reliability of the Gabriel missiles.

The successful introduction of the missile boats can be summarized in the fact that each SAAR boat commander knew: that he is receiving a fighting unit which is superior in performance and speed over any enemy unit it would be sent to confront. That it has destructive capability along with the ability to countermeasure and win in combat. That, despite the gap in the missile ranges which mandated alertness and skill in counter-missile tactics and the cooperation of the entire crew.

The boats had a relatively a small hull in order to reduce costs and thus increase the number of units that may be acquired. The size of the crew was relatively small, such that potential casualties would be less than those experienced in the sinking of the INS

Eilat. Over only a few years, the Israeli Navy reached a high level of readiness. The number of fighting units resulted in local superiority in offensive initiative.

The Yom Kippur War

The Israeli Navy force in October 1973, prior the break of the Yom Kippur War, consisted of 13 fighting units: 2 SAAR-4 missile boats (produced by Israel Shipyards); 6 SAAR-3 missile boats; 4 SAAR-2 missile boats and 2 SAAR-1 boats, which had not yet been armed with missiles (such 12 boats produced in Cherbourg). The Egyptians and the Syrians navies had a quantitative advantage in ships and their missiles had a longer range. The Israeli Navy had an advantage in electronic defense systems for deception and decoys. The events of the war proved that the strategy chosen in the buildup of the Navy's force had not been mistaken. The SAAR missile boats passed the test.

The number of warships was slightly more than the critical mass required. The offensive initiative adopted achieved local superiority in most of the battles.

Letal weaponry – The Gabriel missile proved itself in battle. About 50% of the missiles fired hit their targets. A hit by even one missile was enough to disable an enemy ship.

Missile defense – The investment in missile countermeasures proved its worth. Most of the enemy missiles were fired at decoys and even those aimed at the SAAR boats missed the target.

The success of the military tactics – "tough in training, easy in combat" – Although a coordinated attack according to the SAAR's battle doctrine occurred only once,[10] the familiarity with the doctrine created a common language and every boat commander knew what was expected of him at any given time.

Air Force Cooperation – During the war, the Israeli Air Force was preoccupied with other missions and on other fronts. Air support was provided only in the Port Said battle on the night between October 6th and 7th, 1973. The Air Force's actual involvement was not during the stage of closing the gap in range between the Gabriel and Styx missiles as initially expected, but rather in the chase after a fleeing Egyptian boat. The Egyptians commanders were attacked from the air, and did not manage to obtain a clear picture of the situation and not fire Styx missiles while being chased at sea. Lieutenant Colonel Eliezer Prigat, flying a Phantom F-4, destroyed an Egyptian Osa missile boat with his last bomb.

10 On the 8th of October, 10 Saar boats carried out a frontal assault while deploying decoys in the Port Said area. However, the identification of targets on radar had been mistaken and the attack was called off.

The high speed of the SAAR boats was needed in order to chase fleeing enemy ships after they had fired all their missiles rather than to close the gap in missile ranges, as was deemed needed. The Syrian and Egyptian missile boats remained close to their bases and managed to return there before the Israeli missile boats came within missile range.

High continuous speed – All of the SAAR missile boats could maintain a cruising speed of 30 knots, which enabled concerted forces and quickly prioritizing forces between the Syrian front and the Egyptian front as needed.

The **76-mm automatic cannons** suffered a number of recurring malfunctions, preventing victory in some of the battles.

Shipbuilding in Israel – Six of the SAAR 4 missile boats had been ordered from Israel Shipyards, of which two had been delivered prior to the war. These ships proved themselves beyond any expectation. As mentioned above, the SAAR 4 missile boats were built in order to serve in the Red Sea. According to the plan, they were meant to set out for the voyage around Africa on October 15th. Since the war broke out on the 6th, they operated in the Mediterranean during the war and played a crucial part in the Navy's success.[11] The SAAR 4 boats operated during the latter part of the war in order to guard essential marine shipping to Israel in the eastern part of the Mediterranean and as part of this mission, they reached as far as Malta (where the Egyptians had deployed a destroyer) and operated under difficult sea conditions.

In view of the success of the missile boats in the war, Minister of Defense Moshe Dayan decided to build another batch of six SAAR 4 boats at Israel Shipyards (Project "Nadran"), intended to serve in the Mediterranean. This was in addition to the first batch of six ships that was destined for the Red Sea.

Export – Following their success in the war, the South African navy decided to acquire the SAAR 4. In following years, used SAAR 4's that were no longer in service were sold to the navies of Chile, Sri Lanka and Mexico.

11 In the Latakia battle on the 6th, the INS Reshef was the first to score a hit with their 76 mm cannons on a Syrian torpedo boat that was detected at sea by Latakia. She was also the first to score a hit with a Gabriel missile against a Syrian minelayer that was detected in that same battle. In the battle of Damyet, on the 8th, the INS Keshet was the first to score a hit with a Gabriel missile against an Egyptian fleeing Osa-class missile boat. The INS Reshef joined the force with only 4 Gabriel missiles and was the last to break off contact in the chase after the Egyptian Osa near Alexandria. The effectiveness of the Saar 4 missile boats was proven when on that same mission which they shelled coastal targets in western Egypt and from there were sent to guard shipping in the area of Crete. They were at sea for a full week.

Figure 4: SAAR 4- INS Keshet

The SAAR 4.5 missile boat (project "Nirit")

In 1978 Admiral Michael Barkai, the commander of the Israeli Navy, wanted to add an aerial platform to the offensive capabilities of the SAAR missile boats and therefore designated two of the boats to serve as helicopter-carrying command ships. The positioning of a landing platform and hangar on the rear deck required a change in design. The last two ships in the "Nadran" project were lengthened by almost four meters and were given the name “Chohit” (Finch).[12] The lengthening of the hull gave the ship better flow lines and all of the subsequent boats were built according to this design, with no facilities for helicopters. These boats were named SAAR 4.5.

VADM Micha Ram, the commander of the ISN Reshef during the Yom Kippur War, took over command of the Navy in 1989 and decided on the gradual replacement of the aging SAAR 2 and SAAR 3 ships with the SAAR 4.5.

With the explanation: “On the third overhaul, the body will be replaced”. Each new boat that was launched was assigned the same crew and name of the boat that was being retired from the force. As a result, the newly built boats gathered no resent. The SAAR 4.5 boats were armed with the most advanced systems and in time took on most of the Navy’s missions. The gradual renewal of the Navy’s force structure made it possible to maintain high level of readiness.

12 Two Chohits operated as part of the missile boat flotilla from 1981 until their sale to the Mexican Navy in 2004.

Figure 5: SAAR 4.5- INS Kidon

The SAAR 5-class corvettes

Three SAAR 5 helicopter capable corvettes went into service in the Israeli Navy during 1994-1995, about 25 years ago.[13] The acquisition of the SAAR 5 missile boats began at the initiative of Israel Shipyards, which in the mid-1970s and during the construction of the SAAR 4 missile boats had proposed the construction of a warship twice the size of the SAAR 4. The proposal was not accepted by the IN command at the time. In 1985, the Navy, under the command of Avraham Ben Shushan, carried out special operations on Palestinian targets in Algeria and Tunisia. Fighters from the commando units (Shayetet 13) and Sayerret Matcal (The General Staff Reconnaissance Unit) were delivered ashore in small boats that were placed on the SAAR 4 decks. The operations were carried out in heavy seas and the retrieving of the boats stretched the capabilities of the SAAR boats to their limit.

Operating at long distances required refueling from a taker ship. These operations convinced the IN command to acquire a number of larger ships.

General Israel Tal was asked examined the structure of naval forces in 1988 and recommended the acquisition of three larger vessels. Three corvette helicopter carriers[14] were ordered from the United States. They were were named "SAAR 5", even though they were not having the principles of the former SAAR types. The corvettes s were equipped with a towed submerged detection system that was supposed to give

13 The older of them, the INS Eilat, went into service in May 1994; the INS Hanit went into service in February 1995.

14 A corvette type is a fast ship with high maneuverability, with a displacement of between 500 and 2800 tons.

them long range detection capability. An examination of the capabilities of the SAAR 5 corvettes relative to their missions paints a complex picture.

The **destructive capability** of the SAAR 5 corvette was limited relative to the SAAR 4.5 as it was not equipped with a surface cannon. This precluded the ships from operating offensively at short ranges against other ships, such as terrorist boats, or against coastal targets. During the 25-year period they were in service, the corvettes were not involved in any firefights. The **emphasis on missile countermeasures** on these ships was of little benefit, as can be seen from the incident in which the INS Hanit, while enforcing a naval blockade near Beirut during the Second Lebanon War (2006), was hit by a C-802 missile fired from land. Nonetheless, the SAAR 5 corvette proved useful in **transporting of commando forces** as part of the mission to intercept commercial vessels carrying armaments far from Israel's shores. The hangar and crane on the deck of the ships were used to carry and launch the rubber boats and equipment of the Shayetet 13 commando force.

Table 1: The SAAR-class ships serving in the Navy

Class	Quantity	Buit by	Weapons	Size in tons	Year of production	Crew	Maximum speed in knots	Cruising speed in knots	Length in Meters
SAAR 1*	3	Constructions Mécaniques de Normandie	3 Cannons	250	1967	40	42	30	45
SAAR 2*	3	Constructions Mécaniques de Normandie	5 Missiles 2 Cannons	250	1968	40	42	30	45
SAAR 3*	6	Constructions Mécaniques de Normandie	6 Missiles 1 Cannon	250	1969	40	42	30	45
SAAR 4*	10	Israel Shipyards	8 Missiles 2 Cannons	415-450	1973-1970	45-50	34	30	58
Chohit*	2	Israel Shipyards	Missiles Helicopter	490	1980	53	34	30	61.7
SAAR 4.5	8	Israel Shipyards	Missiles Canon	490	1991	50	34	30	61.7
SAAR 5 corvette	3	Ingalls, USA	Missiles Helicopters	1,200	1995	74	32	17	85.64
SAAR 6 corvette	4	ThyssenKrupp, Germany	Missiles Cannon Helicopters	2,000	Under construction	75	26	15	89.12

* indicates ships that are no longer in service

The capability of Israel Shipyards

Israel Shipyards has proven its capability in the construction of fast attack crafts. Improvements were made in each batch of ships ordered from it. In the past 20 years or so, the Navy has acquired patrol boats only from Israel Shipyards and no missile boats. Israel Shipyards has been attentive to the Navy's needs and planned an advanced ship for it, as part of the "SAAR 72" project which was presented in May 2013 at a naval exhibition in Singapore.[15] Smaller ships were built for Cyprus[16] and a country in Africa.[17] In November 2019, it was announced that Israel Shipyards had received an order to design a new ship for the Navy.[18]

Acquisition of the MAGEN ships

During the 2010s and following the discovery of offshore natural gas in Israel's economic waters, the need arose to guard the natural gas production and transport facilities against enemy activity. The timing was favorable with respect to the Ministry of Finance and financing became available to strengthen and renew the Navy's force structure.

In 2013, it was decided to use the royalties received from the production of natural gas[19] to finance the acquisition of the MAGEN ships (referred to by the Navy as SAAR 6). The main task of the ships was presented as the protection of offshore gas facilities. Their designation as a platform for the firing of missiles at enemy coastal targets remained unpublicized.

During the acquisition process, it was decided on a size of 2000 tons and during the tendering and acquisition process—many details of which have not been made public and some of which are subject to investigation. it was decided that the ships would be constructed by the German ThyssenKrupp company. The deal to acquire the ships

15 "The Navy's new warship is unveiled", Pazam website, May 20, 2013 https://www.mako.co.il/pzm-magazine/war-games/Article-8a463c2eb6dbe31006.htm [Hebrew]

16 The Saar 62 for Cyprus, promotional film clip of Israel Shipyards, January 2018 https://www.youtube.com/watch?v=J_zyzu-h-ww.

17 "Israel Shipyards has sold patrol boats to the gas rigs in Cyprus. Price: One-third of that paid by the Navy to the German ThyssenKrupp", the Calcalist site, September 14 https://www.calcalist.co.il/articles/0,7340,L-3721211,00.html [Hebrew]

18 Udi Etzion, "Learning the lessons of File 3000? The Navy's new missile boats will be built in Israel", Calcalist site, November 6, 2019. [Hebrew]

19 Yuval Azulai, "Germany will sell the ships for defending the gas fields for about NIS 1.8 billion," Globes site, May 11th, 2015. [Hebrew]

was signed in 2015 and had a value of about 430 million Euro,[20] about one-third of which (115 million Euro) was covered by a subsidy from the German government to ThyssenKrupp, with the remainder of about 315 million Euro coming from the State of Israel.[21] In the end, the ships were built by the German Naval Yards company, which is owned by businessmen from Abu Dhabi and Lebanon. The Ministry of Defense claimed that this shipyard is only building the hull while the ship's systems will be installed in Israel.

The ISN Magen, the first of the four corvettes being built in Germany, was launched already in May 2019[22] and will arrive in Israel during 2020 for the installation of the weapons systems. It is expected that the ship will go into service in 2022.[23]

The reference threat

In characterizing the Navy's future ship, the reference threat that it will face needs to be defined. The type of combat and the future reference threat will be complex warfare against state navies, such as the Egyptian navy which is the strongest among those of the Arab navies, asymmetric warfare and littoral warfare (Such as the incident during the Second Lebanon War in which the INS Hanit SAAR 5 was fired on), hybrid warfare, a platform for sea control scrutinizing ships at high seas, guarding Israel's shipping lanes at long range, protecting Israel's economic waters, assistance in land battles, etc.

The **Egyptian navy** is currently being upgraded with 58 ships armed with sea-to-air and sea-to-sea missiles. The ships and weaponry are manufactured in the West and are state-of-the-art. Egypt signed a peace treaty with Israel in 1978 but it should be recalled that during the Yom Kippur War, the Egyptian navy was able to block the Red Sea to shipping and today it is capable of blocking shipping and air traffic to Israel in the Mediterranean, in addition to blocking the Red Sea. In view of the IDF's general lack of preparedness to deal with the Egyptian threat,[24] it is not at all clear how Israel's Navy would deal with the Egyptian navy in the Mediterranean if and when such need comes.

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20 Hagai Amit, "The hidden cost of Case 3000 – half a billion shekels per year", The Marker site, May 20th 2019. [Hebrew]

21 Meirav Arlozorov, "The strange loan from the Ministry of Defense," The Marker, May 20th, 2019. [Hebrew]

22 In view of the submarine scandal, the Saar 6 Hamagen ship was launched in Germany, Sherut Globes, May 24, 2019. https://www.globes.co.il/news/article.aspx?did=1001287023 [Hebrew]

23 Video clip of the launch of ISN Magen. [Hebrew] https://www.facebook.com/israel.navy/videos/377551746220116/?v=377551746220116

24 Yoav Zitun, "IDF preparedness for war: Netanyahu met with Yitzhak Brik", ynet, December 24, 2018 https://www.ynet.co.il/articles/0,7340,L-5432313,00.html [Hebrew]

If the reference threat is not the Egyptian navy, then the question regarding the operational need for a naval force structure remains unanswered.

Fire from ship to Shore – In 2004, a proposal was made to the General Staff for a multi-purpose ship with a displacement of about 15,000 tons that would carry helicopters and amphibious forces. This capability was deemed essential according to the scenarios for fighting in the Mediterranean and for special missions in other theaters.[25]

The main purpose of the proposal was described by VADM Yedidya Yaari:

> "A multi-purpose ship can serve as an alternative fire platform for precision long-range weaponry that will serve as a backup in situations where the Air Force's capabilities have been compromised. The intention would be to deploy such a backup outside the land territory of Israel, and that it would have the same effectiveness as the air force in striking deep into enemy territory. The weaponry needed for this exists, but the ships that can carry out the mission out at sea must be acquired and that calls for a ship that can carry a large number of missiles. A ship with long-range radar that is located out at sea will itself be able to gather information on the entire theater consisting of the eastern quarter of the Mediterranean.[26]

The project proposed by the Navy and supported by the Army Headquarters was not approved in the General Staff.

The inability to accurately hit coastal targets was sorely felt during the Second Lebanon War. Nonetheless, since the Protective Edge operation the Navy has carried out many ship to shore attacks. Notably, such a capability may be attainable using smaller vessels such as the SAAR 4.5.

The shore missile batteries threat – During the Second Lebanon War, the INS Hanit, a SAAR-5 class corvette, was hit by a missile launched from Lebanon shore.[27] The Navy at that time did not have a comprehensive solution for destroying enemy coastal batteries. Attention shifted to acquisition by the Hezbollah organization, and to some extent also by Hamas in Gaza, of shore-to-sea missiles. The Russian made **Yakhont missile system** which was supplied to the Syrians by Russia constitutes a genuine threat and it is believed that it will at some point come into the hands of the Hezbollah.

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25 Yedidya Yaari, *Maarahot*, 419, p. 66. [Hebrew]

26 Yedidya Yaari, "Large ships as the solution to a large problem", *Maarchot*, June 2008, p. 66. [Hebrew]

27 Another missile, fired from the shore at the same event, had sunk an Egyptian commercial vessel M.V. Moonlight in that same incident.

In response to these threats, it is believed that “the best defense is an offense” directed at the enemy’s concentrations of force. Therefore, the Navy would do well to destroy missiles that threaten the gas facilities and other critical infrastructures by attacking the shore batteries from the sea.

A detection and countering system installed on a ship in order to respond to steep-trajectory fire aimed at the gas rigs and other potential threats. The ship would be equipped with anti-missile systems such as a maritime "Iron Dome" and the "Barak 8" missiles and synthetic aperture radar. There have not yet been any reports of accurate sea-to-shore missiles. The weapons of the ship would be armed with stabilized and guided weaponry, such as a surface cannon and the Typhoon Weapon automatic short-range gun system.

Comparison between MAGEN ships and SAAR boats

A comparison of the Navy’s acquisition plan for the MAGEN ships to that of the SAAR ships shows differences according to most of the parameters.

Ship size – At sea, there is an economic advantage to ship size. This is the case with respect to both transport of cargo and ship maintenance. The size of ships in the superpower navies is becoming larger and larger. It appears that anyone associated with ship construction and operations is pleased with this trend. A large ship can better endure rough sea conditions and a larger variety of armament systems can be deployed on a large ship. Its commander has a higher rank and it can operate over longer distances. A ship with an impressive size is also meant to deter potential enemies.

In response to the idea that a large ship will sit in the middle of the ocean and “know everything”, it can of course be claimed that a single ship can only be in one place at a time. Having information on all radar targets in the Eastern Mediterranean would simply create confusion. What is needed is precise information in order to achieve certain identification, which will enable the decision to open fire. Concentration of naval power in few ships provides the enemy with targets which if hit would result in a national disaster. In our view, preference in naval warfare should be given to a combination of traits of a single ship multiplied by the quantity of warships on the front line.

Size of crew – The size of the ship’s crew is determined by the ship’s missions and the weapons systems it operates. It appears that the phenomenon of a crew of hundreds on a sinkable one platform is not an acceptable situation in the eyes of the Israeli public. Following the sinking of the Dakar submarine with 69 casualties, the Gal-class

submarines were designed to operate with about one-third of that number.[28] There were 250 crew members on the destroyers and about 40 on the SAAR boats that replaced them. There has been no effort by the Israeli Navy to reduce crew size. There are currently 53 crew members on the SAAR 4.5 missile boats and 75 crew on the SAAR 5 (including a forward crew for the helicopter). The SAAR 6 is meant to have a similarly sized crew.

The national memory of the Israeli people associates the Navy with national disasters, such as the sinking of the destroyer INS Eilat and the aforementioned sinking of the submarine Dakar. The Bible teaches us the story of David and Goliath. The Philistines put their hopes on a huge and deterring hero but nonetheless a single hero, who was surprised by a method of fighting he was not familiar with. The SAAR 6 is similar to a modern Goliath waiting for the appearance of an Arab-speaking David.

The single fighting unit – The reference threat was at first the Skori destroyer which was replaced by the Osa missile boat. The commander of a SAAR knew that in a one-on-one battle he has an advantage with the Gabriel missile over the cannons of the destroyer, and there were deception measures and defenses against the Styx missile. The force structure of potential adversaries nowadays includes a large stockpile of missiles of various types. The "Barak-8" weaponry and anti-missile systems, which are in operational use in the Israeli Navy, preserve the battle superiority of the single warship in the view of its planners.

Reduction of missile capable units – Over the years, the Navy's quantity of warships has declined. If in the mid-1980s the Navy reached a peak of 26 missile-capable units, the current flotilla of missile boats numbers only 11, three less than during the Yom Kippur War. Four SAAR 6 corvettes that are to be added, bringing the Navy up to 15 warships. The replacement of the older ships that are scheduled to retire by the SAAR 4.5 will maintain the quantity of surface missile capable fighting units.

Loss of maximum speed – The Cherbourg boats had a maximum speed of more than 40 knots and a cruising speed of 34. The SAAR 4.5 has a maximum speed of 35 knots and a cruising speed of 30. The SAAR 5 missile corvettes have a maximum speed of 32 knots and a cruising speed of 17. The SAAR 6 MAGEN ships are planned to have a maximum speed of 26.

For reference, the newly ships of the US Coast Guard are built to have a maximum speed of 47 knots and a cruising speed of 40.[29]

28 Moshe Imbar, *Submerge and Dive*, p. 73.

29 For example, the USS Gabrielle Gifford (LCS-10).

Extension of operational range – A longer range of operation was achieved at the price of reduced speed. The Cherbourg-built SAAR boats maintained a cruising speed of 30 knots and their voyages had consistently been at that speed. Their operational range was 1200 miles. The SAAR 4 and following it the SAAR 4.5 doubled the operational range while maintaining a cruising speed of 30 knots.

The SAAR 5 ships have an operational range of 2500 nautical miles at a cruising speed of 17 knots. The SAAR 6 ships will have an operational range of about 4000 nautical miles at low speed.

Production in Israel – The first SAAR ships were built relatively quickly and inexpensively at Cherbourg. But they became subject to a political embargo. This possibility should be taken into account when building abroad. Acquisition of ships from domestic production enhances the overall naval capabilities.

The SAAR 4 and SAAR 4.5 were built at Israel Shipyards. The SAAR 5 corvettes were built in the US and the MAGEN corvettes are being built in Germany, including partial funding by the German government of one-third of the cost.

It is possible to build large ships in Israel. Israel Shipyards produces missile boats of 70 meters in length for foreign customers. The IN had acquired six "Shaldag" patrol boats from Israel Shipyards and ten Devorah-class ships from Israel Aircraft Industries.

Use of drones – The SAAR boats benefited from aerial support up until the Yom Kippur War and thereafter. The SAAR 4.5 ships were lengthened to accommodate a landing area and hangar for a helicopter. The SAAR 5 was built with its main component being a helicopter whose task it is to detect and identify enemy vessels. The naval helicopter squadron is part of the missile boat flotilla. A naval helicopter is also planned for the SAAR 6 ships.

While Israel is a pioneer in the development and production of drones, a version to be operated from a ship has not yet been developed. Even the accident in which a naval helicopter crashed into the sea in September 1996 for unknown reasons[30] did not induce the Navy to change its thinking on this issue.

Conclusion

The Navy obtained a ship that fit its needs when it acquired the SAAR 4.5, which was built by Israel Shipyards. Later, the Navy has focused on the development of

30 Summary of air force accidents at www.sky-high.co.il

various types of less successful ship platforms rather than focusing on development of innovative naval weapons systems.

The four MAGEN ships constitute an addition to the Navy's capability of protecting Israel's shores, including the facilities for the production and conveyance of natural gas.

It would have been worthwhile to direct the investment toward the acquisition of a larger number of ships built by Israel Shipyards.

The need for "many fast boats carrying lethal weapon" is as valid in Israel's current situation as it ever was.

In order to maintain the ability to sail fast and reduce the quantity gap in Missile capable warships, the older ships should be replaced by new Israeli-made SAAR boats, which will be equipped with state-of-the-art weapons systems and which will be operated by a reduced crew.

Fifty Years since the War of Attrition – Naval Flanking Maneuvers and Amphibious Landings: Lessons from the Past and the Challenge of the Future

Benny Shpanier

> *"A full-scale amphibious operation is a high-stakes enterprise. It either succeeds dramatically or fails dramatically. There is nothing in between."* Lt. Gen. Bernard E. Trainor[1]

1. Introduction

Operation Raviv began on the morning of September 9th, 1969.[2] In this operation, three 36-meter tank landing crafts were landed on the west side of the Suez Canal. They were transporting an armored force consisting of six Tiran (T-55) tanks and three BTR armored personnel carriers (P-50) which had been painted with the colors of the Egyptian army.[3] The force advanced along a 70-km stretch of coast and inflicted significant causalities on the Egyptian army. There are those who believe that this was one of the factors that hastened the end of the War of Attrition in August 1970.[4] The operation could not have been carried out without the amphibious landing of forces and everything that that involves.[5]

1 The United States Marine Corps portal. Lt. Gen. Bernard E. Trainor served in the Marines from 1946 to 1985. His last position was battalion commander. He participated in the Vietnam War and the Korean War. After his retirement, he served as the New York Times military correspondent and also as a military commentator.

2 See: Zohar Avraham, *The Watershed – The War of Attrition – the Sword of Instinzaf in the Suez Canal Theater* 67-70 (2012) 231-232 (herein: Zohar 2012); Zohar Avraham, "Escort, Raviv – Raids on the Suez Coast," *Maarahot* 297, 15, 17-23 (1985) (herein, Zohar 1985); and Benny Michaelson "The Assault Tankman – Brigadier General Baruch Harel ("Pinko") z"l," *Shiryon* 54, 46-48 (2019). For further details on Operation Raviv, see below.

3 The tanks and APCs had been captured, renovated and painted with Egyptian colors for purposes of deception.

4 See Oded Tira, "One cannot mention 50 years since the War of Attrition without mentioning the operations that ended it," online *Maariv* https://www.maariv.co.il/journalists/opinions/Article-706111 (July 1, 2019). (All of the websites in the article were accessed in August 2019).

5 As part of the background to Operation Raviv, it is also possible to include the landing that was planned from the west at El Arish in the Six Day War (but not carried out due to the rapid advance of IDF land forces) and also the landing that was planned during the Yom Kippur War in the Gulf of Suez and not carried out due to the development of the fighting. These incidents demonstrate that it is not always possible to exploit landing capabilities.

The military historian Basil Henry Liddell Hart wrote as follows: "Amphibious flexibility is the greatest strategic asset of a sea-based power."[6] In his article on amphibious forces, he even claimed that they are to be preferred to aerial forces.[7] Their advantage lies in the fact that they do not need airports which require the training of manpower and continuous protection. In particular, amphibious forces are able to transport heavy vehicles and equipment which helicopters are not able to. And indeed over the years the ability to land from the sea has been put to good use and often in a daring and awe-inspiring manner, such as in Operation Raviv.

Naval flanking maneuvers and amphibious landings, in which naval forces support land forces,[8] are part of the flanking tactic, which also includes vertical envelopment.[9] For many years, the Israeli navy had such a landing capability and used it to carry out missions of this type. The largest and most well-known was during Operation Peace for Galilee in 1982.[10] In August 1993, landing craft were removed from service in the navy and essentially the possibility of using the naval flanking tactic no longer exists. In 2016, the navy unveiled Menta,[11] a naval vehicle capable of landing a limited amount

6 See: B.H. Liddell Hart "The value of amphibious flexibility and forces flexibility," *Tsiklon* 9 20 (1981) (herein: Hart 1981). He coined the term "indirect approach strategy". His essay is based on an analysis of the significance of the amphibious threat to the German army in the Second World War. He shows how a large percentage of the German corps remained on the shores of the Atlantic out of fear of a landing by the Allies instead of joining the battle against Russia (see: pp. 14-18).

7 See Hart (1981) above, footnote 6, p. 14; Lawrence Freedman, Strategy: History 134-138 (2013) (herein: Freedman).

8 On the current use of landing forces by armies around the world, see for example: BALTOPS' sees Romania exercise amphibious capability outside Black Sea region for first time; Colombian Navy launches latest amphibious ship, Janes 360', https://www.janes.com

9 See *Dictionary of IDF Terms* (1998). "Vertical envelopment; a flanking or wrapping around the enemy's land systems and forces, which is accomplished using airborne forces, parachuted or air-landed forces behind enemy lines. Vertical envelopment is different from the regular land flanking and the transportation of forces by air (which is not vertical envelopment), such that the landed force and the main friendly force are separated by significant enemy forces. **Vertical envelopment will be considered tactical or systemic according to the type of target, its results (effects) and the level of command managing it** (emphasis in the original)."

10 See, for example, Gidon Raz, "Naval flanking maneuvers in a land battle," *Army and Strategy* 3, 1 (2011) (herein: Raz, 2011).

11 See: Shai Levi, "Behind the scenes: The secret unit of the Shayetet," *Mako* https://www.mako.co.il/pzm-magazine/Article-0bad6a1a509c451006.htm (May 19, 2016).

of equipment and forces along the coast and behind enemy lines and which can serve as a logistic supply line for an attacking land force.[12]

Fifty years after the War of Attrition, and in particular Operation Raviv, this article will attempt to determine whether landing from the sea is relevant today, in view of the lessons of the past. In other words, in view of the fact that in the past it was decided not to maintain the landing capability of the navy and the fact that the IDF and the navy are currently working to recreate the possibility of naval flanking maneuvers and amphibious landings, it is worthwhile examining the nature of this tactic and to look at a number of historical cases in order to determine whether naval flanking maneuvers and amphibious landings are still relevant for similar IDF activity in the future.[13]

Figure 1: 95-meter land craft INS Bat-Sheva (Clandestine Immigration and Naval Museum)

12 Ibid. This article discusses landing ships (LTS) and mechanized landing craft (LCM). These are naval vessels whose role is to carry assault combat forces that include troops and AFVs. These vessels are limited in speed. The discussion will include the use of cargo ships that are capable of carrying equipment and unloading it at piers (see below). There currently exist landing craft of various shapes and sizes, including battleships that can carry landing craft and airborne forces (which will not be discussed in this article since they involve strategies that go beyond the focus of this discussion).

13 See: Alfred Thayer Mahan, *The Influence of Naval Power Upon History 1660-1783*. In his opinion, there is value in learning from naval history, particularly in the domain of naval strategy, but also in the tactical domain if account is taken of continual technological progress. In his words: “The battles of the past ended in success or failure according to the degree of compatibility between their management and the principles of war; the seamen who study the reasons for success or failure in an in-depth manner will not only identify and gradually assimilate these principles but will also acquire growing skill in the application of these principles, for tactical use on ships and with modern weaponry.”

2. Historical Background

The tactic of naval flanking maneuvers and amphibious landings for offensive purposes has been known for more than 2000 years; nonetheless, armies have used it again and again in fighting against land forces and have even invested efforts in improving it.[14] This section will survey a number of milestones in the history of naval flanking maneuvers and amphibious landings. A number of conclusions will be drawn from these historical examples and with regard to practical lessons on how to correctly implement naval flanking maneuvers and amphibious landings in the present and the future.

2.1 Naval flanking maneuvers and amphibious landings in the Peloponnesian War

Thucydides was an Athenian historian who lived in the first century BCE.[15] In his book "The History of the Peloponnesos War", he describes the wars between Athens and Sparta.[16] The battles occurred throughout the Aegean Sea region and occurred on land and at sea. There were also battles that included naval flanking maneuvers and amphibious landings. Thucydides recounts that Pericles, the Athenian leader, built a navy consisting of hundreds of ships on which sailed a force of 4,000 infantry soldiers (known as hoplites) and three hundred cavalry. The latter sailed on old ships that were re-outfitted for this task.[17] Thucydides' writings show that the Athenian military, which had a relatively small land force, understood the advantage in being able to transport land forces by sea and thus to avoid costly battles in order to advance on land. In other words, naval flanking maneuvers and amphibious landings were intended in this case to win battles by exploiting a relative advantage, namely the ability to travel by sea and to land forces.

14 See Bryan Clark & Jesse Sloman, Advancing Beyond the Beach: Amphibious Operations in an Era of Precision Weapons, Center for Strategic Budgetary Assessment 1-2 (2016); Gilmore N. Birklund, The Future of Amphibious Operations: Shaping the Expeditionary Strike Group to Fight in the Joint Task Force, Joint Forces Staff College, Joint Advanced Warfighting School 9-21 (2010).

15 Shatzman, Yisrael, *The Encyclopedia of the Classical World* (1981). Thucydides (400-455 BCE) was the greatest historian in the ancient world who wrote the history of the war between Athens and Sparta. His goal was to write about events as they actually happened and to give them his own interpretation.

16 See Thucydides, *The History of the Peloponnesus War* (Translated by A.A. Halevi (1958) (herein: Thucydides). He claims that Sparta started the war against Athens due to their recent victories against the Persians and the fear of Athens' increasing power. The Athenians fought and beat the Persians in order to liberate their countrymen in the Aegean Sea region. During the war, the Athenians created a powerful navy.

17 Ibid. Second volume, paragraph 56: "…and three hundred cavalry were transported on horse transport ships which were old ships renovated for the first time."

2.2 The amphibious landing at Gallipoli

On April 25th, 1915, forces from Britain, Australia, New Zealand and France landed on the coast of the Gallipoli Peninsula.[18] The landing force numbered about 75,000 soldiers, about 1,600 horses, donkeys and mules and about 300 vehicles.[19] The force was led by about 2000 ships which included warships and mobilized passenger ships, fishing boats, leisure craft, ferries, coal carriers, etc.[20] These vessels landed the forces on five different beaches in the southern part of the Gallipoli Peninsula. The French force, which was intended to serve as a diversion, landed on the eastern shore of the Bosporus Strait, on the Asian side.[21] The landing operation failed in the sense that the forces did not manage to penetrate beyond the coast. The forces were not sufficiently organized and lacked basic intelligence, a situation that forced them to dig in on the beaches without any possibility of advancing.[22]

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18 See Alan Moorehead, *Gallipoli* 110-113 (second volume, 1983) (herein: Moorehead); Nigel Steel, *The Battlefields of Gallipoli – Then and Now* (1990) (herein: Steel). The landing is to be understood through the lens of the events that preceded it since the start of World War I in August 1914. In October 1914, the Turks blocked the Bosporus Strait and thus imposed a blockade on Russia which prevented ships from entering the Black Sea. This was in addition to the German blockade of Russia by way of the Baltic Sea. The need to break the blockade, as well as the belief that the Turks were not a serious opponent, motivated the British and the French to act. The first operation, which was intended to penetrate through the Dardanelles Strait located at the southern entrance to the Marmara Sea on the way to the Bosporus in Istanbul, began on February 19, 1915. Its goal was to destroy the artillery that threatened the passage of ships. The operation was not much of a success. The second operation started on March 19th, 1915 and was meant to attack at the narrowest point of the Dardanelles Strait. Sixteen warships were mobilized for the mission, and by the end naval mines and the Turkish coastal artillery had sunk no less than three British ships and a French ship and two others were badly damaged. The British and French came to understand that without control over the Gallipoli Peninsula, which is located in the southern part of the Strait, it would not be possible to win the battle for the Dardanelles and that sooner or later someone would have to land at Gallipoli.

19 See Moorehead, above footnote 18, p. 101. Participating on the side of Britain (India, Australia, New Zealand and Newfoundland) and France.

20 Ibid., p. 108.

21 Ibid., p. 110-113; see Peter Doyle & Matthew R. Bennett, "Military Geography: the Influence of Terrain in the Outcome of the Gallipoli Campaign, 1915," 165(1) *The Geographical Journal* 15(1999).

22 Ibid. To a great extent, the landing of the forces was bound to fail due to their lack of familiarity with the topography of the beaches. Among other things, it is worth noting the following lacunae in their intelligence: some of the beaches were narrow and inappropriate for landing; in the case of some of the beaches, the landing vessels could not get close enough to land forces; there were beaches on which land maneuvering was not possible or they lacked points of control that would make it possible to become properly entrenched on the beach; on some of the beaches, it was not possible to conceal the landing; and there were beaches without any drinking water. In other words, the necessary reconnaissance of the topography had not been done and in particular there was no up-to-date intelligence that would make it possible to choose less obvious beaches where the enemy would not set up defenses behind them and which would be appropriate for the landing of forces.

On the other hand, the Turks were not taken by surprise and fought tenaciously to halt the advance of the forces and to protect the coast. However, they did not manage to push the British and their allies back into the sea, thus leading to a stalemate.[23] The battle on the Gallipoli Peninsula lasted for 259 days – from April 1915 until the beginning of January 1916. The British and French forces suffered about 250,000 casualties during this period.[24]

2.3 The naval flanking maneuver and amphibious landing by the Allies at Normandy in World War II

The landing at Normandy on June 6th, 1944 was the largest in history and played a decisive role in the victory of the Allies in World War II.[25] This was the event that opened the second front against Germany and signaled the beginning of the end of the Nazi regime. Operation Neptune, which was the naval operation to transport and land the forces that would carry out Operation Overlord, the operation on land, involved more than 5,000 naval vessels. On the first day, the Allies landed about 156,000 troops by sea and by air.[26] This was a massive operation and its full description is beyond the scope of this article. We will focus the discussion on only one point, which is not necessarily the most significant but is important for the rest of the discussion on naval flanking maneuvers and amphibious landings, namely the deception used in such operations.

The Germans believed that the Allies would land according to the development of the war and previous landings in other theaters.[27] The main question from their perspective was where the landing would be, in order to fortify and defend that area. As a result of Operation Bodyguard (a deception operation whose northern segment was called Northern Fortitude), the Germans at first thought that the landing would be in Norway

23 See Moorehead, ibid., footnote 18, p. 115. Another landing attempt occurred in August 1915 but was not successful either. Thus, Britain and France remained on the beaches without the ability to advance.

24 Ibid., p. 322.

25 See Raz 2011, above footnote 10, p. 40; Steven Ambrose, *D-Day* 33 (2013) (herein: Ambrose).

26 See Ambrose, above footnote 25, pp. 223-241.

27 See Raz 2011, above footnote 10, p. 40; Ambrose, above footnote 25, p. 33. By the end of 1943, the Allies had carried out three successful amphibious assaults: in North Africa (November 8th, 1942), in Sicily (July 10th, 1943) and in Salerno (September 9th, 1943); see also Barbara Brooks Tomlin, *With Utmost Spirit: Allied Naval Operations in the Mediterranean 1942-1945* (2004).

and would set out from Scotland.[28] Another segment of the deception operation was South Fortitude which led the Germans to believe that the invasion would in fact land at Pas-de-Calais, which is north of Normandy.[29] In short, up until a week after the landing at Normandy, the Germans still thought that this was a deception operation and continued to maintain large forces opposite the Pas-de-Calais beach.

Figure 2: American soldiers landing at Omaha Beach on 6 June 1944 (US coast guard)

28 See Ambrose, above footnote 28, p. 70-71. Norway was chosen because of the German submarine bases there, which were essential to its offensive operations. The radio waves were filled with false broadcasts with a low level of encryption and the Germans believed that indeed the landing would be in Norway. The result was that in the spring of 1944 the Germans reinforced their forces in Norway with no less than 13 divisions. See also Antony Beevor, *The Battle for Normandy* 21-22 (2010) (herein: Beevor); and Hart 1981, above footnote 6, p. 17.

29 See Ben Macintyre, *Double Cross: The True Story of the D-Day Spies* 17 (2013) (herein: Macintyre); Ambrose, above footnote 25, p. 71-75. American troops under Patton's command were chosen for the operation since the Germans thought he would lead a landing assault in view of his experience. The troops were stationed at Dover which is opposite Pas-de-Calais. The deception was so successful that at the end of 1944, the Germans thought that the Allies had 89 divisions at Dover while there were actually only 47. Rommel, who commanded the coastal defenses, believed that the landing would be at Pas-de-Calais and concentrated forces there that would be needed later on at Normandy. See also Beevor, above footnote 28, p. 21-23.

2.4 The naval flanking maneuver and amphibious landing at Inchon, Korea

On June 25th, 1950, North Korean forces supported by China and the USSR attacked South Korea and within 72 hours had captured Seoul, the capital.[30] General Douglas MacArthur, who had been the governor of Japan since World War II, was appointed as commander of the UN forces that were to repel the invasion.[31] He formulated the plan for an amphibious landing at Inchon which is at the southwestern corner of the Korean Peninsula and is about 40 kilometers from Seoul.[32]

The beach at Inchon was defined by the American forces as the worst possible location for a landing.[33] It required navigating between islands and in particular the difference between high and low tide was about 10 meters, the largest in the world. The flanking maneuver required an almost maximal high tide in order to allow the landing craft to reach the line of disembarkment on the beach.[34] The first high tide was reached in the early hours of the morning which did not allow for the safe passage of the landing craft in darkness through the islands leading to the beach. The second high tide on that day was after sunset and required landing on the beach and capturing it at night, not a widely employed practice in those days.[35] The solution was an assault in two waves.

The UN forces landed on September 15th, 1950 according to MacArthur's plan.[36] The first wave, which was led by smaller ships, attacked and captured the beach in the early morning hours. It took control of key points on the beach, including the harbor in order

30 See Robert Debs Heinl, *Victory at High Tide: The Inchon-Seoul Campaign* 29 (1980) (herein: Heinl).

31 Ibid., p. 22-29. In order to respond to an invasion, a UN policing force led by the US was established. The partner countries sent forces to the port of Pusan in southeast Korea, which was well-fortified and well-defended against North Korean attacks. The Americans did not have any significant forces in the region (except for the Korean forces) that could meet the invaders. See also: Zev Almog, *Commander of Sayeret 13, My Life's Voyages* 957-959 (2014) (herein: Almog 2014).

32 See Hanl, above footnote 30, p. 40-43.

33 Ibid. p. 41 (1980). The amphibious strategy of the American Navy sets out seven criteria for assessing a landing site: 1. the possibility for naval forces to support the landing and the subsequent operations; 2. shelter from difficult sea and weather conditions; 3. the suitability of the beaches and the paths of access to them with respect to size, depth of the sand, ability to maneuver and the landing ability of the assault ships and landing craft; 4. full hydrographic information on the landing area (depth of water, the terrain, etc.); 5. the possibility of mines in the surrounding waters; 6. conditions that affect the ability of the enemy to prevent the attackers from removing mines; 7. facilities for the unloading of ships and the ability to improve them.

34 Ibid., p. 45.

35 Ibid., p. 52.

36 Ibid., p. 297-300.

to facilitate the arrival of the rest of the forces in the evening hours.[37] The operation was successful in that it cut off the North Koreans from their lines of supply, and thirteen days after the landing MacArthur restored control over South Korea to its President in the recaptured city of Seoul.[38]

Figure 3: American troops landing in Inchon on 15 September 1950 (US navy)

2.5 The naval flanking maneuver and amphibious landing during the Falklands War

The long dispute between Britain and Argentina concerning sovereignty over the Falkland Islands, as well as two other island groups (the South Georgia and South Sandwich Islands) culminated in an Argentinian invasion of the Falklands on April 2nd,

37 Ibid., p. 114-150.

38 Ibid., 297-300. See also Leckie Robert, *Conflict: The History of the Korean War 1950-1953* 228 (1996). Another landing operation during the Korean War was the amphibious rescue carried out between December 15th and 24th, 1950. In this operation, the UN forces carried out an awe-inspiring rescue of forces from Hungnam beach which had been surrounded by the Chinese. About 105,000 UN soldiers, about 90,000 Korean refugees, about 17,500 vehicles and hundreds of thousands of tons of equipment were rescued.

1982 and of South Georgia Island on April 3rd, 1982.[39] Britain responded by sending a task force to the far-off islands in order to reestablish its sovereignty.[40] What is relevant for our purposes is the amphibious landing of two Landing Platform Docks (LPD) named Fearless and Intrepid and the landing craft that they transported.[41]

The British chose to land their forces at San Carlos Bay, which is on the western side of Eastern Falkland Island. They believed that it would be easier to carry out a naval landing there since most of the enemy's land forces were concentrated at Stanley, the capital, which is about 70 km southeast of the landing point.[42] In other words, the force chose to carry out a flanking maneuver and to exploit the weakness of the defending land forces at the point of landing.[43] The landing was preceded by a vertical envelopment by the British SAS and SBS commando forces, which were delivered by helicopter from the north and south of San Carlos Bay. Its goal was to prevent the Argentinian forces from interfering with the amphibious landing and the capture of the beach.[44]

During the 21st of June, 1982, the weather in the landing areas was unfavorable and as a result the Argentinian air force did not detect the ships that carried the forces to the beach.[45] On the night between the 21st and the 22nd of May 1982, the British carried out the landing on five beaches, during which the landing craft returned to the LPDs to make additional trips. By the morning of the 22nd of May, about 4,000 troops

39 See Julian, Thompson *3 Commando Brigade In the Falklands: No Picnic* 20-21 (1992) (herein: Thompson). The Falkland Islands are about 1300 km from Britain, 650 km east of southern Argentina and about 550 km northeast of the Cape of Horn. In 1767, the British first landed on the islands and named them after the Viscount of Falkland. From 1826 to 1831, the British maintained a permanent presence on the island. Argentina never gave up its claim to the island. In 1981, after a military junta had taken over the Argentinian government, the claim was renewed and later led to the outbreak of war.

40 See Thompson, above footnote 39, p. 26-31.

41 Ibid., p. 64. The force practiced its landing abilities during the voyage to the Falklands at Ascension Island in the Atlantic. For details on the importance of the joint exercise between the land and sea forces, see Thompson, above footnote 39, p. 34-46; see Hart, 1981, above footnote 6, p. 18-19.

42 See Thompson, above footnote 39, p. 51-54. See Martin Middlebrook, *Task Force: The Falklands War, 1982* 195-205 (1987) (herein: Middlebrook).

43 Due to the huge distance from Britain and the composition of the taskforce, the naval force was at a disadvantage with respect to aerial protection. The British had 42 Harrier fighters on board the ships in the taskforce while the Argentinians had about 150 fighters stationed on the island and in Argentina.

44 See Middlebrook, above footnote 42, p. 206-208 and Thompson, above footnote 39, p. 70.

45 See Thompson, above footnote 39, p. 68-69.

of 3 Commando Brigade had landed and had dug in to protect the beachhead, while artillery units, and in particular anti-aircraft guns, were brought to the beach.[46]

As weather improved on the day following the landing, the aerial advantage of the Argentinians began to come into play and the planes attacked the ships that were unloading the landing forces. During these attacks, two British destroyers and a frigate were sunk.[47] The British air force tried to defend the land forces, but they were nevertheless under constant threat from the air.[48] Despite the difficulties, the well-trained British force managed to establish themselves on the island and with the assistance of additional forces—which made it to the beach despite the aerial attacks—captured the city of Stanley. This led to the surrender of the Argentinians on June 14th, 1982, 74 days after the outbreak of the war.[49]

2.6 The naval flanking maneuvers and amphibious landings by the IDF

The IDF has employed landing craft in the past.[50] During the Sinai Campaign in 1956, landing craft of the Israeli navy accompanied the advancing tank forces along the coast

46 Ibid., p. 72-74.

47 Ibid., p. 77. See Middlebrook, above footnote 42, p. 221-224. Later on, other ships were damaged and some of them sunk. In total, six British ships were sunk, including one landing craft.

48 See Thompson, above footnote 39, p. 76-77. Despite the heavy British losses, the tide turned during this period. In parallel to the British losses, the Argentinians lost many of their planes. These losses increased during the second week of fighting and the Argentinians were forced to reduce the number of sorties, which made it possible for the British to advance.

49 See Middlebrook, above footnote 42, p. 374-388. See also Doron Almog "Superior command, skill and bravery," *Maarahot* 328 46 (1993) (herein: Doron Almog). Almog analyzes the fighting capabilities of the British army and its victory on the battlefield despite numerical inferiority. It is his view that the victory was the result of their professional and moral advantage. See also Hart 1981, p. 18-19 on the importance of joint training of amphibious and land forces.

50 See the Israel Navy association site http://www.amutyam.org.il – landing craft. Landing craft were first used by the navy already during the War of Independence. Over the years, the unit grew to the scale of a flotilla (Shayetet 11) but later was cut back to a number of squadrons that were spread out among the various bases according to need. During the War of Independence, a landing craft landed an infantry force in order to raid a battery of Egyptian artillery near Ashkelon and a landing was also carried out in Nahariya in order to deliver equipment. It is worth mentioning that various types of landing craft have been used by the navy. In the State's early years, from 1948–1956, it had a number of tank landing craft that could carry a number of tanks and trucks (up to 5 tanks); troop landing craft could carry infantry; and vehicle landing craft (which were purchased from the US Sixth Fleet after WWII) which could carry several vehicles or light tanks. Between the early 1960s and the late 1970s, landing craft were built in Israel. They included 36-meter landing craft, 60-meter landing craft and 95-meter landing craft. There were also landing ships (Landing Ship, Medium – LMS) that were purchased as surplus from the US Navy. The Israel Navy also had a number of transport ships and a roll-on/roll-off ship. This also included a merchant ship that was mobilized in the Second Lebanon War in order to land an artillery regiment in the port of Beirut.

of the Sinai peninsula to Sharm el Sheikh and assisted in the transport of fuel to the force, which was cut off from any other supply route.[51]

2.6.1 During the War of Attrition

As mentioned, landing craft took part in Operation Raviv,[52] in which tanks and APCs were loaded onto three landing craft at Ras Sudar in the Sinai Peninsula and landed on the western coast of the Gulf of Suez (Ras Abu Darj) after the beach had been occupied by naval commandos and paratroopers.[53] The night before, in Operation Escort, Israeli Commando had sunk two torpedo boats that regularly patrolled the area.[54]

The armored force that was landed from the sea occupied points along the highway and the coast along a 70-km stretch. There were about 20 positions in the sector, starting from positions held by squads of soldiers and up to those held by companies consisting of about 150 soldiers, tanks and radar.[55] The force moved along the highway from North to South, killing about 100 Egyptian soldiers and destroying about 70 vehicles (including APC's) and radar. During the entire operation, the air force protected the sector by attacking an anti-aircraft battery, bases in the vicinity and enemy forces that tried to engage the Israeli force.[56] The operation came to an end during the afternoon hours of September 9th. The AFV was evacuated by the landing craft and the soldiers were evacuated by helicopter, under aerial.[57]

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51 See Raz 2011, above footnote 10, p. 41; see the site of the Israel Navy Association http://www.amutayam.org.il – landing craft. Mechanized landing crafts (LMC) built in Israel were used to land three tanks and supplies south of the Gulf of Eilat for Brigade 9 on their way to Sharm el Sheikh.

52 See Zohar 2012, above footnote 2, p. 230-231. See also Zohar 1985, above footnote 2, p. 15 and Raz 2011, above footnote 10, p. 41.

53 See Zeev Almog, "The naval arm in Operation Peace for Galilee," *Maarahot* 413 11 13 (2007) (herein: Almog, 2007). See also Zohar Avraham "The Navy in Operation Peace for Galilee," *Maarahot* 285, 45 45-47 (1982) (herein: Zohar 1982). This involved two landing craft of 36 meters in length.

54 See Zohar 2012, above footnote 2, p. 230-231. See also Zohar 1985, above footnote 2, p. 23. Participating in Operation Escort, which was carried out early in September 1969, were eight soldiers of Shayetet 13 who sunk two F-183 torpedo boats that were anchored at Ras Sadat and which regularly patrolled the area in which Operation Raviv took place. If the ships had not been destroyed, command of the sea in the area would not have been guaranteed. On the way back from the operation, one of the soldiers' vehicles exploded as the result of a technical mishap and three of them were killed.

55 See Zohar 2012, above footnote 2, p. 232.

56 Ibid. During the operation, one aircraft was downed and the pilot was lost at sea.

57 Ibid.

When the scale of the operation became known, Egyptian President Nasser suffered a heart attack and dismissed the Egyptian Chief of Staff and the Commander of the Navy. In our context, it is important to mention the following points: Command of the sea was achieved in a special operation (see below) involving a joint effort by the navy, the air force and the army.[58]

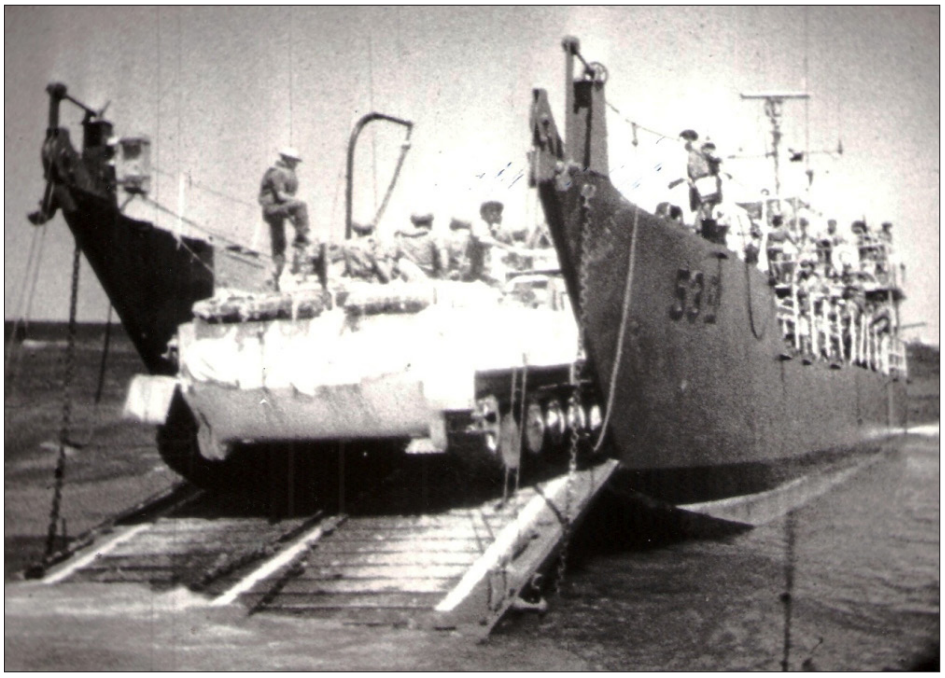

Figure 4: INS Caesarea loading an enemy (Egypt) BTR-50 at operation Raviv
(Clandestine Immigration and Naval Museum)

2.6.2 Operation Peace for Galilee

Which began in June 1982, included the largest naval flanking maneuver and amphibious landing ever carried out by the IDF.[59] Prior to Operation Peace for Galilee, the landing craft were not a significant force in the navy and they received only minimal

58 See Zohar 1985, above footnote 2, p. 23.

59 See Almog, 2007, above footnote 53, p. 11. This was the largest naval operation in the history of the navy with respect to number of vessels. See Mike Eldar, *Shayetet 11: the Battle for the Medal* 204-224 (1996) (herein: Eldar). See also Benny Mam "Operation Peace for Galilee: The main military operations," *Maarahot* 284, 24 (1982) (herein: Mam) and Zohar 1982, above footnote 53, p. 45.

investment,[60] despite the fact that infantry and armored forces had trained according to scenarios of an amphibious landing.[61] The mission, as defined by the navy, was, among other things, to land a force of paratroopers from the 96th Division and to transport APCs, equipment and additional forces to Lebanon.[62] The goal was to cut off the terrorists in Southern Lebanon from their headquarters and logistics center in Beirut and also to threaten the Lebanese capital.[63] The infantry and armed forces were loaded onto three landing craft that began to move northward. The decision of whether to land at the mouth of the Zaharani River or that of the Awali River was only made when the force was already on their way and close to the landing. The decision was primarily influenced by the progress of the land forces that were moving north from the border at Rosh Hanikra. A landing at the Awali River would be a surprise to the terrorists since it was a flanking maneuver around the city of Sidon from the north.[64] During the entire voyage from Israel to Lebanon, the navy's ships escorted the landing craft force and the air force kept the skies clear of any possible aerial attack.[65]

The naval commando force captured and combed the landing beach and set up ambushes around it in order to isolate the beach and prevent the arrival of reinforcements.[66] Later on, a force of paratroopers was landed which expanded the beachhead and reinforced the defenses.[67] After securing the beach, armored and infantry forces were landed according to plan, almost without incident.[68] On the day after the initial landing, the

60 See Almog 2014, above footnote 31, p. 1271. Due to the limited budget for building new landing craft, the navy was forced to continue maintaining the old ones and was unable to renew the fleet. See Zohar 1982, above footnote 53, p. 46. During Operation Peace for Galilee, the landing craft force consisted of a 95-meter landing craft (the Batsheva), two 60-meter landing craft (the Ashdod and the Achziv); and a number of 36-meter tank landing craft (the Etzion Gaber, the Caesarea and the Shikmona). See the site of the navy association http://www.amutayam.org.il

61 See Zohar 1982, above footnote 53, p. 47.

62 Ibid., p. 46. During Operation Peace for Galilee, the following missions and priorities were defined for the navy: achieving command of the sea, landing forces on the coast of Lebanon, fire support for the land forces, and securing the naval flank of the land battle (preventing attacks by land forces from the sea).

63 See Mam, above footnote 59, p. 45; Almog 2007, above footnote 53, p. 12; and Zohar 1982, above footnote 53, p. 46.

64 See Almog 2007, above footnote 53, p. 17-18. The Awali beach was preferred by the navy since it was sandy and without any obstructions and it provided convenient access for the landing craft and egress from the landing site without any constraints.

65 See Zohar 1982, above footnote 53, p. 47.

66 See Almog 2014, above, footnote 31, pl. 1274-1276.

67 See Mam, above footnote 59, pl. 46 and Almog 2007, above footnote 53, p. 12.

68 See Almog 2014, above footnote 31, p. 1278.

landing craft were again active on the beach, this time in broad daylight. This put them under some threat of being fired on and therefore they required protection and smoke screening in order to prevent any losses to the landing craft or their crews.[69] During the first week of the fighting, the landing craft transported about 4000 vehicles and APCs and subsequently hundreds of additional vehicles in order to tighten the blockade on Beirut.[70]

Figure 5: IDF troops on a landing craft on there way to land at Awali 1982 (Idov Toren)

Figure 6: IDF landing crafts at the Awali coast 1982 (Yossi Ben Hanan)

69 See Zohar 1982, above footnote 53, p. 47 and Eldar, above footnote 59, p. 226-233.

70 See Zohar 1982, above footnote 53, p. 47, Almog 2014, above footnote 31, p. 1280 and Zeev Almog "Israel naval forces – an essential component on the battlefield," *Tsava and Estrategia* 3(1) 25 33 (2011).

3. Lessons from the history of naval flanking maneuvers and amphibious landings

The historical review illustrates the complexity of naval flanking maneuvers and amphibious landings and that each historical event must be treated on its own. Nonetheless, some general lessons can be learned for naval flanking maneuvers and amphibious landings in the present and in the future.

3.1 The strategic importance of the naval flanking maneuver and amphibious landing option

In June 1944, several days before the invasion of France by the Allies, only 55 percent of the German army (165 divisions) were fighting on the Eastern Front to block the advance westward by the Russian forces. All the rest—45 percent (133 divisions)—had been transferred to the West or the South in order protect against the threat of naval invasion by the Americans and the British.[71] This demonstrates the strategic importance of the very existence of a naval flanking maneuver and amphibious landing option.

General MacArthur, during the preparations for the naval flanking maneuvers at Inchon, insisted that the element of surprise—and in particular the ability to attack the rear of the North Korean forces that were closing in on Pusan—is the key to success. Following are MacArthur's words as quoted by Heinl in his book: "An amphibious landing is the most powerful weapon we have. In order to use it correctly, we must strike with power and depth!" Other thinkers also felt that the ability to land from the sea is an important capability for a country to maintain. This ability has strategic importance that constitutes a threat to the enemy, who will have to take it into account by allocating possibly large defensive forces and also the attention required for defending against it. These resources will have to be diverted away from the main fighting effort. Thus, it would appear to be correct to invest in such an operational capability.

3.2 Command of the sea[72]

The goal of achieving command of the sea as a condition for naval flanking maneuvers and amphibious landings already existed in the Peloponnesian War, in which the

71 Se Hart 1981, above footnote 6, p. 16-17.

72 The term "command of the sea" is used in this article primarily in relation to the balance of forces between the warring navies in the naval theater and the possibility of one navy creating for itself and for the country's commercial ships the freedom to travel on certain routes and to prevent the enemy from doing so in times of both peace and war. This ability can be achieved by destroying the navy of the enemy or by threatening to do so. For further details on command of the sea, see George W. Baer, *One Hundred Years of Power: The U.S. Navy, 1890 -1990* 451 (1994); Geoffrey Till, *Sea power: A Guide for the Twenty-First Century* 45 - 86 (2013); Geoffrey Till, *Maritime Strategy and the Nuclear Age* 128 - 132 (1984); and Freedman Lawrence, *Strategy: History* 117 - 188 (2013).

command of the sea by the Athenian navy in the region of fighting gave Athens the possibility of free passage for cargo ships, in addition to its warships.[73] British and French forces at Gallipoli also had command of the sea, which allowed them free passage of ships to reinforce and maintain their forces during the entire duration of the campaign.[74] Prior to Operation Raviv during the War of Attrition, the navy carried out Operation Escort in order to ensure command of the sea in the sector and to secure the passage of the undefended landing craft.[75] In Operation Peace for Galilee, the navy had command of the sea and the air force had command of the air and as a result the landing on the beach was not opposed by any significant enemy forces.

The complex challenge of achieving command of the sea can be seen in the fighting for the Falkland Islands, which illustrated the reality of operating with command of the sea but not command of the air. The British had clear command of the sea and they even imposed a sea blockade for 200 miles around the Falkland Islands.[76] The lack of command of the air, as described above, led to the loss of British ships. The question is whether the lack of command of the air can lead to a situation in which command of the sea becomes meaningless and prevents the possibility of carrying out naval flanking maneuvers and amphibious landings. In other words, is command of the air a prerequisite for naval flanking maneuvers and amphibious landings?

3.3 Deception

The use of deception can also be seen in the history of naval flanking maneuvers. In Gallipoli, due to the narrowness of some of the beaches, it was not possible to use deception and therefore the Turks were able to dig in and wait for the landing forces. The French and British lacked a topographic analysis of the coast and primarily up-to-date intelligence that would allow them to choose beaches that were not so obvious or beaches that would allow for deceptive maneuvering. In this way, the Turks would not be able to correctly prepare their defenses and the forces would be able to land without any major opposition.

73 See Thucydides, above footnote 16, the Second Volume, sections 25-31.

74 See Moorehead, above footnote 18, p. 135. Furthermore, an Australian submarine penetrated into the Sea of Marmara and was able to ensure that Turkish naval forces were not able to reach the landing area in order to attack the naval force during its mission.

75 See Zohar 2012, above footnote 2, p. 230-231 and Zohar 1985, above footnote 2, p. 23.

76 See Middlebrook, above footnote 42, p. 206-208. The blockade was meant to prevent reinforcements from reaching the Argentinian forces on the islands, as well as facilitating the accumulation of forces by the British navy without any threat from the sea.

During World War II, the Allies understood that attacking a fortified beach in order to land forces may involve a heavy price—even in terms of a world war—that may hinder or even halt a landing from the sea. The task of deception was a joint effort by several arms of the military. It was considered to be a mission all on its own and its degree of success—namely the extent of the opposition that the landing force would encounter—was put to the test even before the landing. In the case of Normandy, deception was achieved to an exceptional degree and contributed significantly to the success of the operation.[77]

A prime example of the importance of surprise and the advantage it provides to the attacking force is the landing of armored forces on the western shore of the Suez Canal in Operation Raviv.[78] Another example is the flanking of the city of Sidon during Operation Peace for Galilee.

The tactical importance can also be seen in the deception used during the Falklands War. It was clear to the Argentinians that the British intend to recapture the islands and the only question was where and when. Nonetheless, the British landing managed to surprise the Argentinians who had concentrated their forces in Stanley rather than on the landing beach. The British were careful to choose beaches that were out of range of the artillery concentrated in Stanley and this resulted in the landing of a force large enough to capture and defend the beach.[79]

3.4 Landing in daylight as a limitation

The landings at Gallipoli and Normandy were carried out in broad daylight while the landing at Inchon, in the Falklands and during Operation Peace for Galilee were carried out at night. It is possible that the character of commando warfare in the latter group—i.e. small and inferior landing forces facing the defending force, which lessens the preference for a landing at night as opposed to large scale operations in broad daylight—has almost no significance. The need to carry out a landing in darkness constitutes a limitation due to the increased difficulty in understanding the terrain of the beach; nonetheless, darkness constitutes somewhat of a tactical advantage for the commando force. On the other hand, a landing in broad daylight requires that the landing force have the ability to overcome the defending force under those conditions.

77 See Macintyre, above footnote 29, p. 17-21.

78 See Zohar 1985, above footnote 2, p. 23.

79 See Thompson, above footnote 39, p. 36-39.

3.5 The need to support the landing over an extended period of time

In the historical examples of Gallipoli (259 days), Normandy, Inchon (13 days), the Falklands (74 days) and Operation Peace for Galilee, the naval forces were required to maintain a supply route and routes for evacuation of the landed forces. Thus, naval flanking maneuvers and amphibious landings are sometimes missions with a long duration that require command of the sea and the ability to fill the needs of the land forces over time.

3.6 The need to capture a harbor or port

Although in theory an amphibious landing is perceived as an operation to land forces on an isolated beach, the historical examples show that in at least some of the cases the capture of a harbor or port is an integral part of the landing capability. This was the case at Normandy,[80] at Inchon[81] and in Operation Peace for Galilee.[82] This provides major advantages in the ability to transport forces on a large scale on civilian ships (such as Roll-on/roll-off ships) but it can also create complex challenges involving the enemy's threat to the port. In other words, the port becomes a large and exposed target that is difficult to defend.

4. Summary and Conclusions

Navies continue to maintain amphibious vessels, an indication that at least from their perspective amphibious landings continue to constitute a real option and that readiness must be maintained.[83] The question then arises in the case of the IDF and the Israeli navy: Should this capability be restored and added to their range of options? The challenges facing the navy exist in various theaters of operation and on different levels of complexity and therefore a comprehensive solution to this issue requires an in-depth and comprehensive examination of all the scenarios in each theater. Nonetheless, it

80 See Ambrose Stephen E., *D-Day, June 6, 1944: The Climactic Battle of World War II* (1994).

81 See Heinl, above footnote 30, p. 114-150.

82 See the site of the Navy Association, http://www.amutayam.org.il – landing craft. During Operation Peace for Galilee, the A.M. Yasmin cargo ship was mobilized to transport and unload an artillery regiment at the Port of Beirut.

83 See, for example: the US navy https://news.usni.org/2018/07/24/navy-and-marine-corps-racing-to-increase-amphibious-fleet; the British navy https://www.savetheroyalnavy.org/tag/amphibious-capability; the Russian navy http://www.navyrecognition.com/index.php/news/defence-news/2018/june-2018-navy-naval-defense-news/6296-russian-navy-expects-to-start-building-new-landing; the Indian navy https://economictimes.indiatimes.com/news/defence/india-to-make-naval-ships-that-can-launch-attack-in-enemy-zone/articleshow/58777785.cms

is possible to highlight a number of general challenges that are relevant to this type of warfare.

The first is command of the sea in the area of the landing, which is a prerequisite for naval flanking maneuvers and amphibious landings. Achieving command of the sea may take time and thus there is a resulting loss of flexibility. Additionally, and to the extent that command of the sea is achieved, command of the air will also be necessary in order to defend against coastal or aerial threats (as in the case of the Falkland Islands), which may require a long period of time. Thus, the landing is liable to be deferred until the necessary conditions are achieved and in the meantime it may become irrelevant.

The second challenge will be to overcome the tactics of the enemy in the landing area which are meant to prevent or hinder the landing and which may include a strategy of Anti Access/Area Denial that includes sea mines and also coastal missilery.[84] The IDF's working assumption should be that eventually an amphibious landing will be on a defended beach. The more extreme working assumption should be adopted along with its implications with respect to the composition of the force, the size of the participating forces and the investment made in preparations. Above all, it is essential to understand that in extreme scenarios an amphibious landing can incur significant loss of life and equipment.

The third challenge is deception.[85] There are those who believe that there is no more important factor and that deception is more difficult to achieve than surprise.[86] It appears that only large-scale deception can make naval flanking maneuvers and amphibious landings an easier task and reduce the risk of the enemy fortifying the landing point. If the IDF does not make a significant investment in this direction, the capture of a beach will become much more difficult with respect to its price and as a result a doubt may arise as to the ability of the operation to succeed.

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84 For further details see, for example Clark and Sloman, above footnote 14, p. 1-8; see Jones Dorian Frank, *The Viability of Large Scale Amphibious Operations on the Eve of the Twenty First Century in the Light of Military Operations Other Than War (MOOTW), High and Law Technology Weapons, and Weapons of Mass Destruction*, Faculty of the U.S. Army Command and General Staff College 29-72 (1997).

85 See Sun Tzu, *The Art of War* 39 (translated by Efraim Broide) 1996. "The spot where we intend to fight must not be made known; for then the enemy will have to prepare against a possible attack at several different points; and his forces being thus distributed in many directions, the numbers we shall have to face at any given point will be proportionately few."

86 See Macintyre, above footnote 29, p. 16.

The fourth challenge is the participation of the navy in decisive IDF operations. The aspiration that the navy will play a role in defeating the enemy by means of naval flanking maneuvers and amphibious landings is appropriate and positions the navy as an important military force. However, it may be that the navy has other missions with higher national priority, such as the protection of the natural gas platforms. The need for a defensive force alongside the landing force, as well as protecting it over time in order to maintain the momentum of the landing effort, will require the allocation of significant naval forces.

In summary, it is correct to assume that just as Israel is aware of the fact that the IDF and the navy have begun to build a naval flanking maneuver and amphibious landing capability, so is the enemy. The enemy, as mentioned, will now have to invest thought, resources and effort in stopping an amphibious landing, which will reduce the enemy forces available in other locations, which are the sites of the main fighting. However, this also means that the amphibious landing force will face more difficult combat. Thus, fifty years after the success of Operation Raviv, it appears that the military paradigm of amphibious landing as carried out in the War of Attrition and Operation Peace for Galilee is no longer relevant and in the analysis of risk it will be correct to assume that the battlefield in the next war will look totally different and Israel will need to be ready.

Maritime Terror in Israel

Shakked Dabran

This chapter describes Israel's efforts to deal with maritime terror and presents a historical review of maritime terror against Israel. It includes a discussion of events that Israel has had to deal with during its history as well the more recent trends. The latter part of the article presents the challenges currently facing Israel in the context of maritime terror. According to the conclusions reached in the article, the war against maritime terror requires first-quality intelligence, a preventative approach, an up-to-date and appropriate doctrine and creativity and innovation in the research and development of weapons systems.

The term "terror" relates to the "systematic and intentional use or threat of violence to achieve political ends." In general, it can be claimed that terror is a political tool.[1] Maritime terror includes attacks or the threat of attacks on vessels (cruise ships, tankers and other cargo ships, tugboats and bulk carriers, etc.), ports and land/shore targets in the vicinity of ports (such as oil refineries and undersea cables). There are additional types of maritime terror, such as the hijacking of cargo or passenger ships in the open sea. The definition of maritime terror also includes attacks or the threat of attacks against the civilian population from the sea, since the home front is a terrorist group's main target. Another type is the threat of maritime cyber terror. The efforts to stop terror include preventative, defensive and offensive measures that are meant to reduce terrorist attacks and respond to them.[2]

Israel is an interesting and important case in the discussion of maritime terror. The situation in Israel is complex and the maritime space is one facet in which this complexity is manifested. Throughout Israel's history, it has experienced numerous conflicts of different types and one of those has taken place—and continues to take place—in the maritime domain.

1 Ganor, B. (2009), "Terrorism in the twenty-first century". In *Essentials of terror medicine*. Springer, New York, NY: 13-26; Michel, K. (2006), "War, piracy and terror: the high seas in the 21st century". *The Journal of International Maritime Law* 12: 313-324; Sakhuja, V. (2007), "Sea Piracy in South Asia". In P. Lehr (Ed.), *Violence at Sea: Piracy in the age of Global Terrorism*. New York: Taylor & Francis Group: 23-36; Kanev, D. (Ed.). (2005), *Seaborne trade effects of international terrorism and effectiveness of the anti-terrorist policy*. UK: WIT Press, Ashurst Lodge, Ashurst, Southampton; Valencia, M. J. (Ed.). (2006), *The Politics of Anti-Piracy and Anti-Terrorism Responses in Southeast Asia*. Singapore: Institute of Southeast Asian Studies.

2 Bueger, C.& Edmunds, T. (2017), "Beyond sea blindness: a new agenda for maritime security studies, *International Affairs* 93 (6); Power, J. (2008), "Maritime Terrorism: A New Challenge for National and International security", *Barry law Review* 10; NATO, web: https://www.nato.int/cps/en/natohq/topics_77646.htm [28.4.2019].

The State of Israel is in a unique position. It can be compared to an island nation in that the sea is the exclusive route (apart from the aerial route) for the import and export of goods. Therefore, the sea is highly important to Israel. The length of Israel's Mediterranean coast is 196 km, to which is added the 14 km length of the Gulf of Eilat coast. Similarly, most of Israel's population and industry is located within close proximity to the coast. Israel has six ports: two for energy (Hadera and Ashkelon) and four for loading and unloading of ships (two in Haifa Bay – the Port of Haifa and the shipyards port, Ashdod and Eilat). To these will be added two new additional ports that are under construction: the Hamifratz port and the Hadarom port. Israel's territorial waters include a territorial sea out to 12 km, a contiguous zone out to 24 km and an EEZ of 70-100 km from the coast. Maritime trade and cargo account for 98 percent (in terms of volume) of Israel's total trade and it is of high strategic importance.

Until the late 1960s and early 1970s, Israel did not attribute a great deal of importance to maritime terror. Prior to the Six Day War, terror originated primarily from Gaza, with the encouragement of Egypt. The Israeli navy maintained routine patrols, but these were not directed against enemy activity but rather to maintain a presence. The most serious maritime threat to Israel was from the navies of the Arab countries. This threat reached a peak in the Yom Kippur War in 1973. During the war, the Israeli navy emerged as a dominant player in the maritime domain. At the same time, the Palestinian terror organizations were becoming stronger and the threat of terror from the sea also began to develop.

Following the Six Day War (1967), Israel's coast doubled in length, which meant defending a much larger territory. Another significant event that led to increased terror from the sea during that period was the Black September events (1970), which led to the transfer of Fatah headquarters to South Lebanon, from which it carried out numerous terror attacks against Israel, both by land and by sea. As a result of this new phenomenon, the Israeli navy began a buildup of strength and the preparation of its vessels and manpower for fighting terror. The threat of terror increased in parallel to the diminishing threat from the Arab navies, particularly after the peace treaty with Egypt (1978). The threat of terror forced the IDF, and the Israeli navy in particular, to develop new abilities and doctrines, which include the ability to defend the coast using advanced detection systems and newer and faster ships for patrolling and maintaining security.[3]

3 Gour Lavie, O. (2017), "Building the Israeli Power in the Face of Terror Threats and Other Threats," *Strategic Maritime Assessment for Israel – 2016*, Haifa Research Centre for Maritime Policy Studies& Strategy, University of Haifa: 126-133.

In 1969, the first infiltration occurred and it became clear that terrorists in Lebanon were bringing explosives into Israel. On November 3rd, 1969, a torpedo boat near Rosh Hanikra identified a target that had crossed the border. The captured boat belonged to Fatah and it carried four terrorists and explosives. Between 1971 and 1979, the frequency of terror attacks from the sea reached its peak and the IDF was unable to prevent them or to properly respond to them.

On June 11th, 1971, terrorists set alight the Coral Sea, an Israeli ship on its way to Eilat. Thanks to the quick and effective response of the crew, the ship did not explode. During the 1970s, the most prominent characteristic of maritime terror was arrival from the sea in order to attack the population on the coast. The terror attack in Nahariya on the night of the 24-25th of June 1974 was carried out by terrorists belonging to Fatah in Lebanon. In this incident, one Israeli soldier and three civilians were killed and six civilians were injured. The terrorist was finally killed by Golani soldiers. During that same decade, there was a terror attack on the Savoy Hotel on the Tel Aviv coast, which occurred in March 1975. The two teams of terrorists arrived by boat and made their way to the Savoy. The terrorists took hostages and threatened to kill them if Israel did not release 20 terrorists within four hours. The next day, soldiers of the special operations unit stormed the hotel, killing seven terrorists and capturing one. Five of the hostages were rescued and eight were killed in the operation; two soldiers in the assault force were also killed.

Figure 1: The rubber boat with which the terrorists landed on Nahariya Beach (Clandestine Immigration and Naval Museum)

Another attack during this period and which originated from the sea took place on the Coastal Road. The attack occurred in March 1978 when a group of 11 Fatah terrorists landed on the Maagan Michael beach in rubber boats. They killed 35 Israelis and wounded 71. In response to the attack and the many previous ones, Israel initiated the Litani Operation in South Lebanon. Nonetheless, the attacks did not halt and included an additional attack in Nahariya in 1979, in which a father, two daughters and a policeman were killed.[4]

In October 1985, four Palestinian terrorists from the Palestinian Liberation Front hijacked the Achille Lauro, an Italian passenger ship that was located between the Egyptian cities of Alexandria and Port Said. The kidnappers held the 400 passengers hostage and threatened to kill them if 50 Palestinian prisoners held in Israel were not released. The kidnappers shot one Jewish American passenger. The ship sailed back to Egypt and after two days of negotiations, the kidnappers left the ship and were transported to Tunisia. In September 1985, three terrorists—two Palestinians and one British national—murdered Ester and Reuven Paltsur and their friend Avraham Avneri on a yacht in the Larnaka marina.

The maritime terror attacks during the 1970s and early 1980s had a direct effect on Israel's security doctrine, which called for an even stronger response against the terrorist infrastructure. Furthermore, these attacks demonstrated the need to increase the navy's budget in order to improve Israel's coastal defenses and establish new regulations for maritime safety.[5]

Operation Peace for Galilee, which lasted from June to August 1982, resulted in the expulsion of Fatah from South Lebanon and from Beirut. The organization found a new home in Tunisia but had lost its geographic proximity to Israel. This meant that any further maritime attacks by Fatah and its related organizations would have to deal with much greater distances which would significantly increase the time that the Israeli defense forces would have to respond.

During 1980s and 1990s, there were "only" six large maritime attacks. For example, in 1990 terrorist boats landed on the Niztanim beach. Terrorists in a number of speedboats had set out from a mother ship that had sailed from Libya, intending to land on the Tel Aviv shore and carry out a mass terror attack. Some of the boats were detected and one was halted at sea; however, one of them reached Niztanim beach. A light plane,

4 Almog, Z. (2014), *Commander of Shayetet 13 – The voyages of my life, 2*, Kinneret, Zamoura-Bitan Dvir. [Hebrew]

5 Lorenz, A. (2007), "The Threat of Maritime Terrorism to Israel", IDC Herzliya Navy Association http://www.amutayam.org.il

infantry soldiers and helicopters chased the terrorists; four of them were killed, 12 were captured and one escaped in the refueling boat, apparently to Egypt. No Israelis were harmed during the operation (Navy Association).[6] In addition to these attacks, many others were prevented over the years.

The 2000s were characterized by new waves of maritime terror. During this period, attacks were carried out on Israeli naval vessels. In November 2000, a suicide bomber blew himself up near an Israeli naval vessel although there were no casualties. In 2002, four IDF navy personal were wounded when a bomb went off near a patrol boat of the Israeli navy near the settlement of Dugit in the northern Gaza Strip, an operation for which the Islamic Jihad took responsibility. Another example is the explosive raft that went off near an IDF patrol boat in 2003, an attack that caused no casualties (Navy Association). In addition, a new type of activity appeared – the smuggling of weapons into the Gaza Strip by way of the sea.

In 2001, the Israeli navy captured the ship San Torino which was carrying weapons to the Palestinian Authority. The weapons had been sent by the Fatah organization. On December 11th, 2001 a ship called Karin A arrived at the port of Kish in Iran. Israel received intelligence that the Palestinian Authority had purchased the ship. Based on this information, Israeli intelligence began monitoring the ship. After the Iranians had loaded it with weapons, the ship set out for the coast of Gaza. When it became clear that there was a large quantity of weapons on the ship, a counter operation was decided on that would be carried out by Israel's naval commandos. Once Israeli intelligence had enough information on the ship, Chief of Staff Shaul Mofaz decided that this is the right timing to carry out the operation in order to prevent the ship from reaching Gaza.[7]

Other examples include the capture of the ship Victoria in 2011, which carried Iranian weapons destined for the Gaza Strip. The operation was a success as a result of the intelligence efforts and the ongoing activity of the navy to prevent smuggling. Another example is Operation Full Disclosure in 2014 whose goal was to capture the ship Klos C which flew a Panamanian flag and was attempting to smuggle weapons into the Gaza Strip. The operation took place in the Red Sea, about 1500 km from Israel and was directed by the commander of the navy. The cargo ship carried containers filled with weapons sent from Iran which were destined for terror organizations in the Gaza Strip (Navy Association).

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6 Navy Association http://www.amutayam.org.il/?CategoryID=278 [Hebrew]

7 Zeitun, Y. & M. Margalit (2014) "Laughing and Drifting. This is the Navy's Commander," *Ynet News*, web: https://www.ynet.co.il/articles/0,7340,L-4496052,00.html [July 11, 2019] [Hebrew]

The Gaza Strip is of particular concern to the Israeli defense forces and this situation there had a major influence on activity during the 2000s. During the past two decades, the execution of terror attacks has shifted from mainly secular organizations like Fatah to Islamic organizations such as Hamas, Hezbollah and others. Another important factor in the development of maritime terror is the fact that Hamas is currently using hybrid warfare, such as the use of fishermen in Gaza in order to smuggle weapons by way of the sea.

After the closing of the underground smuggling tunnels between Gaza and Egypt, the sea became particularly important in the eyes of the Palestinians. The threat to Israeli ships is growing, including the fear of explosives. There is a day-to-day war at sea between terrorists, smugglers and fisherman on the one hand and the Israeli navy on the other. Hamas is building up its naval strength, with Israel's natural gas facilities, power plants and oil pipelines as its major targets.

In 2018, an attack tunnel was completed in the Gaza Strip which allowed divers to set out undetected from a Hamas naval base towards Israel. The IDF spokesman reported that this is a special terrorist tunnel that allows divers to leave their base undetected in order to carry out an amphibious attack on Israel.

- In 2018, the Israeli navy uncovered a plan by the Islamic Jihad to carry out an attack involving the use of antitank missiles against Israeli naval vessels and the attempt to capture Israeli seamen.
- Another important example is the fact that Hamas is currently using several components of hybrid warfare. According to a Palestinian captured and interrogated by the defense forces, Hamas is using fishermen from Gaza to smuggle weapons by way of the sea.

According to various assessments by the Israeli navy, Hamas and other terrorist organizations in the Gaza Strip are expected to invest greater resources in carrying out terrorist attacks at sea. This follows Israel's success in making it more difficult for attacks to be carried out using the attack tunnels or by means of rockets. Hamas is continuing its military buildup in the Gaza Strip, including efforts to acquire naval capabilities. It is also continuing efforts to smuggle in naval equipment, diving equipment, etc, as well as to build up its naval commando force. The Israeli navy is responsible for the naval blockade of Gaza, including control over the movement of ships (primarily fisherman/smugglers) opposite Gaza. The war against this terror organization has the characteristics of asymmetric and hybrid warfare, which makes it difficult to defend against these threats.

The current challenge of maritime terror facing Israel

The terror organizations have set themselves the goal of striking at strategic targets (such as national facilities and infrastructures). The discovery of the Noa natural gas field in 1999 and following that the discovery of the Mary field in 2000 ushered in a new era in Israel's energy sector. However, alongside the numerous opportunities implicit in the development of the offshore energy sector, the Israeli navy is currently facing major challenges. Protecting Israel's economic waters is a major challenge in view of both the size of the maritime domain, which is larger than the entire State of Israel, and the nature of natural gas exploration and production. The drilling rigs are civilian installations which of course are not equipped with any means of self-defense. Damage to these facilities will constitute a major strategic blow to Israel and therefore they are liable to serve as a "quality target" for terror attacks.[8]

A number of non-state players have declared their intention to carry out terror attacks against Israeli facilities in general and against offshore energy facilities in particular. Thus, for example, Hassan Nasrallah, the leader of Hezbollah, has explicitly threatened to attack the Israeli offshore drilling rigs. In this context, an exercise was carried out in 2015 that simulated an attempt by terrorists to take over a drilling rig.

According to the commander of the naval base in Haifa:

> "The maritime domain is a classic platform for terror attacks and this sphere will become increasingly active in view of the potential threat to the natural gas platforms and that of infiltration into Israel. Attacks have been carried out by the terror organizations in the distant past, but this is a threat that we must respond to today."[9]

Another important challenge originates from the location of Israel's naval bases. The ports of Haifa and Ashdod, where naval bases are located, are liable themselves to become targets for terrorist activity.

There are numerous threats from the sea.

According to Zeev Almog, commander of the Israeli navy during 1979–1985:

> "Terror attacks from the sea are unique. Terror organizations have used various methods to carry out attacks from the sea, including arrival from the sea directly in boats or from ships out at sea; a commercial ship or a speedboat that fires rockets at

8 Zarchi, N. (2017), "Marine Energy Security," *Strategic Maritime Assessment for Israel – 2016*, Haifa Research Centre for Maritime Policy Studies& Strategy, University of Haifa: 105-114.

9 Brit, A. (2015), "Ready for anything, even in the north", web: http://www.navy.idf.il/994-8761-he/Navy.aspx [10.2.2019].

the shore or delivers a large explosive device that is intended to blow up an essential coastal facility or a naval vessel or tanker; etc." (Almog, 2014: 1322).

Today, we can already add to this list the dangerous threat in the cyber domain, which can provide terrorists with broad and rapid access to targets. This is a new domain of activity that is becoming increasingly widespread. Cyber terror involves use of the Internet in order to cause loss of life or significant damage to property and to achieve political or ideological gain through threats or intimidation. Modern ships are relying more and more on advanced technologies that can almost completely control the functioning of a ship (navigation, engines, weapons systems, etc.). These systems leave the ship highly exposed to the growing cyber threats. In order to be secure, a system must ensure availability of its service, the integrity of information and the maintenance of its communication security. Security policy includes both technical and non-technical components (physical protection, organizational aspects and manpower considerations). Cyber security has become an important basis for protection against terror.[10]

Conclusion

Since its establishment, the State of Israel has had to deal with various types of terrorism. Terror activity from the sea has become a serious threat during the last 50 years and has constituted a challenge both to the state and to the Israeli navy. This has created the need to respond and to minimize the effect of maritime terror on the way of life in Israel.

A future peace agreement between Israel and the Palestinians will apparently not lead to the complete cessation of terror, nor that of maritime terror in particular. There will always be organizations that do not accept the existence of the State of Israel.

There are a number of factors that make maritime terror a particularly attractive option for the terror organizations due to the growing importance of the maritime domain to the State of Israel. This includes the EEZ as a source of energy, the sea as the exclusive channel for international trade, desalinization, international communication and the density of both the population and infrastructure facilities along the coast.

In recent decades, Israel has identified more than 80 maritime terror attacks. While most of them were foiled, the terrorists learned to adapt quickly to a changing environment. At the same time, Israel has also updated its tactics. Additionally, the terror organizations

10 Clermont, C. (2016), "Cybersecurity applies to a marine field" in *Maritime and Port Security: Public Interest or Privet Business*, French National Institute of Maritime Safety and Administration (ENSAM).

operating in this region have developed closer ties with patrons of terror, such as Iran, which provide them with access to advanced weaponry.

The goal of the war against maritime terror is to protect Israel's shores, its maritime sovereignty and its ports. This effort includes the gathering of intelligence, patrolling outside Israel's territorial waters, protection by means of coastal radar, establishment of maritime security zones and programs for the protection of naval forces. There have been numerous changes in the defense against maritime terror and many of them are based on improvement in technology, which can be seen in the development and innovation of the coastal radar stations, planes, the Typhoon weapon station, etc. The doctrine of the fleet continues to develop, with its main goal being to protect the State of Israel based on a combination of different forces.

The adaptation of fighting tactics to meet the challenges of terrorism is not an easy task. Since modern maritime warfare is taking on the character of asymmetric and hybrid warfare, the media image achieved is sometimes more important than the actual outcome. Added to this is the conflict in the cyber domain. As a result, it is important to continually update the doctrine governing the war on maritime terror. Israel is a relatively young state, but nonetheless it has extensive experience in dealing with maritime terror. Israel, for its part, is prepared to share its experience with other countries, with the goal of creating a terror-protected domain.

Summary of the Annual Israeli Maritime Assessment

Shaul Chorev

In 2019, the **Eastern Mediterranean** and the surrounding areas continued to be unstable. The events that followed were: the continued retreat of the US from the region; Russia's entry as a formative power over the region; the strengthening of China's geo-economic impact in the region; the 2011 revolutions known as the "Arab Spring" that led to the collapse of regimes and instability in the region; the collapse of the Islamic State (ISIS) and the significance of this collapse on the continued activities of fundamentalist terrorist organizations; the rise of Iran as a legitimate regional power and the country's impact on the configuration of the Middle East.

Improving the technological capabilities for exploring and producing maritime resources, alongside the expansion of economic waters in the region, has led to struggles and conflicts over their boundaries between some countries, and the reduction of the world's open sea space (High Seas). The Mediterranean has no "High Seas" at all. Two Eastern Mediterranean fleets, the Turkish and Egyptian Navies, are in the midst of a quantitative and qualitative buildup, including increasing their submarine fleet and stocking large surface vessels that bring them to the status of a "green water fleet."[1]

Against the backdrop of the unilateral US withdrawal from the nuclear agreement with Iran and the tightening of its sanctions, **Iran has implemented a brinkmanship policy**, which has been manifested in attacking fuel facilities in Saudi Arabia, assaulting and seizing oil tankers in the Straits of Hormuz as a retaliation for Iranian tanker detention off Gibraltar, and through proxy Houthi activities in the Southern Red Sea region.

With Saudi hesitancy regarding a confrontation with Iran (even after the attack on Saudi oil facilities in September 2019), the vision of a **Saudi-led coalition**, designed to curb Iran and fight Islamic terror, has weakened. Such a coalition would seem to find it difficult to meet its goals, not only because of disputes between the other Arab states

1 "Green Water Fleet" is a term used to describe marine power intended to operate in areas adjacent to the coast of its state, but also with capabilities to operate in the open waters and ocean waters bordering this region. This is a relatively new term and was created to better distinguish between "blue water fleet" and "brown water fleet." It originates in the U.S. Navy, which uses it to refer to a part of their fleet that specializes in offensive operations in coastal waters. Usually, green water fleets have amphibious ships, and sometimes even small aircraft carriers, which can be escorted by destroyers and frigates with some logistical support from tankers and auxiliary ships. It should also be noted that "Green Water Fleet" does not indicate that its ships are unable to function away from shore or open sea, but in the absence of marine logistical support these fleets cannot be deployed for long periods at sea, and for that purpose use ports in other countries to operate at high seas and long distances Offshore.

involved and the Saudis, and because some of them cooperate with Iran, but mainly because of the distrust of American policy in the Middle East. This distrust creates an absence of leadership by an outside power that was previously a prerequisite for forming a regional coalition, such as in the First Gulf War of 1991. Concerned coalition countries have been trying to find alternative mechanisms, including tightening relations with Russia and reducing the severity of a conflagration in a conflict with Iran.

In the geopolitical arena, **Iran** has taken advantage of the situation to upgrade its status in the region to the level of **almost a regional power,** where it is about to fulfill an ancient goal, by which it divides the Sunni world in half, and its influence is about to extend to the Mediterranean sea. The Iranians continued their efforts to establish the foundations for an Iran with geopolitical control and influence extending from the Persian Gulf, through the southern Red Sea to the Mediterranean coast. At the end of December 2019, a joint naval exercise of the Iranian Navy with the Russian and Chinese navies took place, which was a further recognition by those two powers of Iran's position in the region.[2]

In the ongoing conflict between Iran and Israel, Iran has continued to try to maintain bases and influence in Syria, and in several cases has found it appropriate to respond to Israeli assaults by opening fire on the Galilee and the Golan Heights.

A series of recent **civil protests** against the regimes in Iran, Iraq and Lebanon has not yet created the critical mass for change, but has forced these regimes (and in Lebanon's case, also Hezbollah)[3] to address the issue, including violent repression in Iran.

Turkey has also continued its defiant policy towards EU countries, invaded Syria's Kurdish region, expanded its influence in the Persian Gulf and, in late November 2019, signed an agreement to demarcate its economic waters with Libya in the Mediterranean (Maritime Boundary Delimitation Agreement), which could well create a “change in the rules of the game” vis-à-vis Egypt, Cyprus, Greece and Israel in terms of regional geopolitics regarding the production of energy from the sea.[4] In January 8th 2020, Russian President Putin participated in the inauguration of the Turkestream natural gas

2 Iran announces joint naval exercise with China, Russia, *The Times of Israel*, December 4, 2019 https://www.timesofisrael.com/iran-announces-joint-naval-exercise-with-china-russia

3 The Shia Islamist political party and militant group, closely supported by Iran

4 YeniSafak, Strategic, legal aspects of Turkey-Libya deal, December 14, 2019 https://www.yenisafak.com/en/news/strategic-legal-aspects-of-turkey-libya-deal-3507390

pipeline, which, in the first phase, will pipe Russian gas to Turkish consumers, and later will supply natural gas to Europe through Turkey.[5]

Egypt is in the midst of a maritime empowerment process, and many of the country's assets appear to be closely linked to its maritime sphere: the Suez Canal and large Mediterranean deposits of gas, as well as the high potential for discovering additional deposits in the Red Sea.

Israel's entry into a third national election campaign in a one-year period, has paralyzed the work of the Knesset (the Israeli Parliament), delayed the approval of a state budget, almost completely halted the handling of issues related to maritime sphere, such as the Maritime Zone Law, as well as diplomatic steps to demarcate the border with Lebanon, proper implementation of government decisions on shipping tonnage tax, and more.

The two **2019 election campaigns** continued to raise questions about the **Navy submarine and surface combatant procurement deal**. Former senior officials in the Ministry of Defense Procurement (MDP) said that no lessons had been learned from the improper processes that had taken place in the matter, and such irregularities could be repeated. **The ministry of defense must investigate all procurement processes** while emphasizing the control issues and conflicts of interest, to ensure that such malfunctions do not occur again.[6]

In Lebanon, civil protests have arisen in recent months, after the announcement by the Lebanese government in its 2020 budget plans that new taxes on tobacco, fuel and social media platforms would be imposed. The protests prompted Prime Minister Saad al-Hariri to resign. Before his resignation, he proposed a series of economic reforms to calm the atmosphere in the country. At about that time, civil protests also erupted in Iraq, and in both countries there were calls for Iran to stop interfering in their affairs, and in Lebanon, such calls were also made to Hezbollah, although the protest did not appear to have passed the critical mass with regard to its effect on the Lebanese regime. The United States has considered withholding its $105 million military aid to Lebanon, following the resignation of al-Hariri. It is unclear how these issues will affect the talks between Lebanon and Israel on the demarcation of their maritime border, while

5 Benny Spanier, Hay Eytan Cohen Yanarocak, Shaul Horev, "Storm waves Over East Mediterranean", *Center for Marine Policy and Strategy Research and Dayan Institute*, December 25, 2019. http://hms.haifa.ac.il/images/publications/Storm_waves_Over_East_Mediterranean.pdf.

6 Hagai Amit, "The man responsible for the purchase of ships and submarines from Germany reveals what happened behind the scenes in the deals" *TheMarker* July 16, 2017 https://www.themarker.com/news/macro/1.4257890

the U.S. Assistant Secretary of State for Near Eastern Affairs, David M. Satterfield, who had thus far dealt with the issue, was appointed United States Ambassador to Turkey in June 2019.

In the context of the **Persian Gulf countries**, the process of normalizing relations between them and Israel has continued over the past year, even if these have not yet been fully diplomatic. **Qatar**'s monarchy continued to transfer funds to the Gaza Strip, and in total estimates allocated more than $ 1.1 billion in 2018-2012 with the approval of the Israeli government. In 2018 alone, Qatar handed Gaza $200 million in humanitarian aid, and to pay for fuel and salaries to officials. Qatar also pledged to transfer hundreds of millions of dollars more through UN assistance mechanisms.[7] The new Israeli Foreign Minister **Israel Katz** said in his statement to the Knesset Foreign Affairs and Defense Committee in August 2019 that he is "working on advancing the relationships with the Gulf states up to full normalization and signing agreements with them". He said he had visited Abu Dhabi in recent months, and had met with a senior officials in the UAE, at a pre-arranged meeting[8]. However, it should be noted that the focus has been on domestic and regional struggles that many of the Gulf states currently face in close and distant arenas. The problem is compounded by struggles for prestige and conflicts of interest between the states, preventing the formulation of an agreed policy on their relationship with Israel. Katz's announcement of **Israel's participation in the Free Persian Gulf Coalition**, which is a dramatic change in the Israeli government's policy and which has serious security implications- requires an evaluation of the situation by officials, including those from the Israeli navy and the defense apparatus, which, as far as we know, has not yet been carried out.

By contrast, **the south of the Red Sea**, through which about a third of Israel's seaborne trade passes, continues to be a dangerous area for shipping. This is due, on the one hand, to the expansion of the civil war in Yemen and the struggle between Iranian-backed Houthi rebels and Saudi forces, and, on the other, to retaliatory actions such as the attack on the Iranian tanker Sabiti that occurred on October 11, 2019 west of Jeddah in Saudi Arabia[9]. This struggle has surfaced in the form of a number of

7 Yaniv Kubovich “in Israel's Approval: Qatar has transferred more than $ 1 billion to Gaza since 2012”, *Haaretz*, February 10, 2019. https://www.haaretz.co.il/news/politics/.premium-1.6917729

8 Gabi Schneider, "Foreign Minister Katz: 'Israel Participates in Coalition for Secure Free Cruise in the Persian Gulf'", *hidabroot.org*, August 6, 2019. https://www.hidabroot.org/article/1127909

9 Golnar Motevalli, Arsalan Shahla, and Yasna Haghdoost, “Iranian Oil Tanker Attacked as Middle East Tensions Remain High”, *Bloomberg*, October 11, 2019. https://www.bloomberg.com/news/articles/2019-10-11/iran-oil-tanker-catches-fire-after-red-sea-explosion-irna

incidents involving the Houthis, and Iran's statements supporting them, regarding its ability to strategically block the Bab Al-Mandab Strait.

The Russian navy continued its presence during 2019 in **the maritime arena near Israel**, and its presence in the ports of Syria also strengthened. The Russian Navy in the Middle East is based primarily on the Black Sea Fleet, and in November 2019, the Russian Defense Ministry released a video showing a joint maneuver of the Russian Naval and Air forces in the eastern Mediterranean, west of the Syrian coast[10]. It should be noted that the Russians renewed their lease in the Tartus Port (Syria) for another 49 years in 2017 and continued to build infrastructure in the Russian part of the port. Thus, during the summer of 2019, the Israeli navy located a Russian submarine sailing inside Israel's territorial waters and within 8 miles of shore[11]. This event also reflects the increase in Russian naval activity in the Middle East, and the need for Israel to use the joint coordination mechanisms to prevent a conflict between the IDF and the Russian armed forces.

Along with the increase in Russian naval activity in the region, **the US involvement** continued to decline, due to prioritizing the operation of naval forces in other arenas, thus weakening its position in the region. **The deep structural crisis in the EU** also affects the EU's global status, including that in the eastern Mediterranean.

Some of the strategic changes taking place in the region are **fraught with risks for Israel**, notably the strengthening of the Iranian-Turkish-Syrian axis, regarding Israeli concerns about the presence of Iranian naval vessels in the region, a component of power that cannot be ignored. However, new opportunities have arisen that were not open to it in the past. The developing relationship with Egypt, Saudi Arabia and the Gulf states is one of these opportunities, although some argue that these countries are continuing to develop such relations primarily in an effort to solve the Palestinian problem[12]. However, it should be emphasized that Israel's military situation in the region remains robust, and no significant military threat is likely to endanger its existence in the near future, including in the maritime arena.

10 Ruptly, "Mediterranean Sea: Russian Navy and Air Force perform joint drills", November 4, 2019. https://www.youtube.com/watch?v=

11 Ron Ben-Yishai, “This is not a mistake, it is an intelligence surveillance: What did a Russian submarine do to the shores of Israel?” *Ynet,* November 12, 2019. https://www.ynet.co.il/articles/0,7340,L-5623429,00.html

12 Egyptian President's speech, Abd al-Fateh a-Sisi Basiot, "If we could resolve the issue of our Palestinian brethren, peace would be warmer… I have asked Israeli leaders to allow this speech once or twice because it is a real opportunity", *Walla! News* May 17, 2016. http://news.walla.co.il/item/2962078

This assessment is a **Policy Oriented Document**, as opposed to an academic document, and accordingly, we have found it appropriate to summarize it in ten recommendations that are mainly addressed to the political echelon and to the various government ministry. All recommendations relate to matters of Maritime Policy. The order of presentation does not necessarily represent the importance or degree of urgency required to deal with them.

The following insights can be drawn from the current year's report:

- **East Mediterranean, Persian Gulf and Southern Red Sea** - are in a state of instability.
- **US** - has reduced its presence and maritime influence in the Eastern Mediterranean region.
- **Russia** - has strengthened its presence and influence in the entire Mediterranean region and throughout the Middle East.
- **China** - runs a geo-economic and Soft Power strategy,[13] to position itself as an influential power in the region.
- **Iran** - has strengthened its status and influence in the region and is ready to uphold a policy of brinkmanship in its campaign against the US.
- There is a process of integration of **Russia, Turkey and Iran axis, and in a sense also China**.
- **Cyprus** - it appears that a zone of tension and conflict is developing around Turkey, the Mediterranean countries, Greece, with the possible involvement of the United States and the European Union, in light of the controversy over economic waters, exploitation of energy sources and Turkish regional influence extending as far as the Libyan coast.
- **The weakening of the pragmatic Sunni bloc (led by Egypt and Saudi Arabia)** is in evidence, as a result of the weakening of the US position in the region, Egypt's economic and domestic problems, and the decline of Saudi Arabia status.
- **Turkey's defiant policy** towards NATO is evident as she attempts to establish new facts within its maritime borders, in particular with regard to an agreement with Libya that attempts to drive a wedge into relations among Egypt, Israel, Greece and Cyprus.
- In recent Israeli election campaigns, the **Ministry of Defense's and Navy's procurement policy** has emerged as a leading issue in public discourse in the context of irregularities in the process..

13 Soft Power - the ability to attract and co-opt, rather than coerce.

- Issues in the **marine environment** have begun to become central to Israeli public discourse, including opposition to establishing the *LIVAYATHAN* production rig in its currently proposed location.

Here are the ten recommendations of the report:

First Recommendation - Formulating Improved Marine Policy and Strategy for Israel

Since the previous report, no progress has been made on this issue, and even in the election campaigns, this issue has not found a place in the platform of even a single party.

In addition to developments in the Mediterranean region, which require the formulation of a new naval strategy, the **Red Sea and the Gulf of Eden** have recently undergone some major changes, also mentioned in this report, which we believe require a redefinition of Israeli interests in the region and their inclusion in the process of formulating Israel's maritime policy and strategy.

We continue dissemination of position papers and analysis work of the HMS, to assist decision makers and public leaders on strategic issues in the maritime sphere, such as three key issues that have come to the fore in the past year:

1. **Operation of the new private port being developed in Haifa Bay by the Chinese company SIPG**[14] (with American pressure): the issue finally found expression in a diplomatic security cabinet decision (on foreign investment).
2. The research work carried out by the HMS on the demarcation of the maritime border with Lebanon and the recommendations on the best way to conduct the negotiations.
3. The HMS's research work for Zikhron Ya'akov council, examining the location of the LIVAYATHAN field production rig and the type of production platform.

Second Recommendation - Security of Essential Shipping to and From Israel under Routine and Emergency situations

Israel's geo-strategic situation requires the existence of merchant ships and seafarers' infrastructure for civil and security needs. The Israeli shipping industry is in constant economic competition against merchant fleets of countries with maritime traditions,

14 Avi Bar-Eli "Chinese Company to Run New Haifa Port", *Ha'aretz*, 24/3/2015. https://www.haaretz.com/israel-news/business/.premium-chinese-group-to-run-haifa-port-1.5341712

on the one hand, and countries that allow shipping under flags of convenience, on the other.

This competition has caused the Israeli shipping sector to be in difficulties, and it has even deteriorated over the past year, both in terms of the number of Israeli ships (only six ships) and in crews (110 seamen).

It is important to maintain a minimum size of an Israeli merchant fleet capable of emergency shipping to and from Israel, and, accordingly, to implement Government Resolution No. 1107 of December 30, 2013, designed to improve the competitiveness of Israeli shipping, to preserve professional expertise in the field, and continue to maintain a vital maritime infrastructure and Israeli maritime transport system.

1. Policies must be formulated to operate a vital merchant fleet and ports operating in emergencies under precision rocket and missile threats.
2. The Turkish demand for ownership of the economic water zone south of Cyprus, an area with vital shipping lanes for Israel, requires a situation assessment.
3. With the rise in cyber threat in general, and Israeli shipping and ports in particular, a plan to protect the IT and the OT of the Israeli merchant fleet, ports and infrastructure against cyber-attacks must be formulated.

Third Recommendation – continuing The Israeli Navy Power Building process in order to Meet Challenges in the Naval Arena

The naval power building program, designed to address two major challenges that have arisen in the last two decades, must continue:

1. Israel's lack of terrestrial strategic depth and the increase in the threat of the Ground-to-Ground missiles and Rocket Artillery[15] (quantity, range and accuracy) over the entire territory of the State of Israel, including strategic assets and facilities with potential for environmental risk in the event of a strike.
2. Finding gas in the economic waters of the State of Israel and relying on that gas as a key component of the Israeli energy economy.

Due to changes in the character of naval warfare, changes in the balance of power in the Mediterranean (and in particular the turbulence transferred by Turkey to Israel), and the increasing threats in the Red Sea to Israeli shipping needs, it is important to

15 A surface-to-surface missile (SSM) or ground-to-ground missile (GGM) is a missile designed to be launched from the ground or the sea and strike targets on land or at sea. They may be fired from hand-held or vehicle mounted devices, from fixed installations, or from a ship. Rocket artillery is artillery that uses rockets as the projectile.

examine whether the current navy and its concepts of operation meet the needs of the State.

In the past decade, deficiencies and irregularities in the Ministry of Defense procurement and procurement processes have been identified. On March 3, 2019, the State Comptroller of Israel asked the Attorney General of Israel to refrain from conducting an investigation of the case, because the findings at the time were available to the state attorney office to decide whether to file charges against those involved. In December 2019, bill of indictment was filed, including against former senior Navy officials.

The Navy and Israeli security forces must investigate these matters and learn lessons from malfunctions exposed by the bills of indictment presently submitted in relation to the acquisition processes of the naval branch.

Fourth Recommendation – Development and Utilization of Energy Resources at Sea and Environmental Protection

Given the expected market conditions in Europe and the world in the coming years, the government and gas companies in Israel should concentrate most of their efforts on developing the domestic and regional gas economy over distant export markets. The signing of gas export contracts between Egypt with the Tamar and Leviathan gas partnerships is certainly a step in this direction[16].

Gas penetration into new sectors of the economy (agriculture, transport, housing) should be encouraged through the provision of incentives, and especially by facilitating existing sectors to use natural gas through the reduction of cumbersome and burdensome regulations.

The decisions to move the *LIVAYATHAN* production rig and its construction to a location in close proximity to the coast, while leaving the *KARISH* and TANIN production rigs near the border with Lebanon and located a long distance from the coast (70-80 km), indicate that they are largely detached from current realities. Competent mechanisms capable of **examining alternatives** and **presenting logical arguments** for each are essential.

Maritime Policy & Strategy Research Center has carried out an applied research project examining the vulnerability of the various alternatives for marine energy infrastructures, regarding the treatment and resilience of natural gas and oil fields,

16 Lior Gutman, New Contract with Egypt: Whale doubles gas exports to neighboring country, *Calcalist*, October 2, 2019 https://www.calcalist.co.il/local/articles/0,7340,L-3771282,00.html

following security incidents[17]. HMS has recommended (and still maintains its opinion) that in examining the various alternatives, the position of a rig in the range of 35-40 km offshore and based on a floating production platform (FPSO) capable of disengaging after completion of the reservoir life, is the optimal solution for the problem.

Because the location of the rig is probably already an established fact, and platforms like it depend on information technology and on operational computing of strategic and environmental damage potential, a properly constituted state-level authority should be established with responsibility for planning responses to and defenses against cyber threats/incidents and accidences/acts of aggression on the drilling platforms and production facilities, The facility management should be held criminally responsible in the event of a failure occurring due to cyber-attack/malfunction or accident.

Thus, since further gas discoveries are expected in the Israeli marine space in the future, it is appropriate to **decide on a body that will coordinate this type of work from time to time, and to formulate tools that will allow analysis and balance between the various components affecting the facility's vulnerability**.

Environmental policy should be formulated to protect the ecosystem through a program that identifies the environmental components that must be considered in relation to marine natural gas, including preparedness for hazardous events. Appropriate measures should be taken to avoid/deal with such events, and the relevant bodies should cooperate in necessary oversight.

Fifth Recommendation – Moving infrastructure from Land to Sea

Israel's coastal strip is home to many infrastructures that take up valuable space, and some are dangerous. A government decision of June 7, 2012 approved the establishment of an inter-ministerial steering committee to consider the technological feasibility of establishing artificial islands off the Israeli coast for infrastructure purposes.

The first cluster to be selected for the operation included a gas production facility, a gas-powered power plant, a desalination plant and a hazardous materials facility. At a later date, it would also be required to consider the construction of an airport on an artificial island at sea.

As of the date of the decisions **swift technological changes have occurred** (such as using FPSO – floating devices for producing gas), which free users from the need to

17 Nir Zarchi, Vulnerability Analysis for Alternatives to Natural Gas Marine Treatment Systems The Case of Security Threats to the 'Generation' Array, July 2018, *Center for Marine Policy and Strategy Research on the Internet* http://hms.haifa.ac.il/images/publications/Nir_Zarchi/nir.pdf

use sand as a base substance, or devices on poles limited to the continental shelf, and on completing their task or long-term preparations for emergencies these can be transferred from their location.

Because the planning work for an airport at sea would take many years, it is necessary to start pre-feasibility studies as soon as possible.

Sixth Recommendation – Development of a professional human infrastructure to address Israel's new challenges in the maritime field

The public resources required for investment in social systems in Israel (education and higher education) must be determined, in order to build an economic, social and human-professional infrastructure that can meet the challenges and opportunities inherent in the maritime sector, including energy production, energy development, marine law, ecosystem protection, including the industries needed to address these issues, as well as the establishment of an Maritime Stakeholders Cluster which will serve as a platform for public discourse.

The importance of the marine sphere to the State of Israel finds no expression in the various research and development programs of the Ministry of Science. It is appropriate that at least one of the eight regional research and development centers should have a center on marine space, and it is also true that the Israel Space Agency (ISA) should allocate resources for the development and research of the israeli maritime arena from outer space.

Stopping / reducing the budget of the Council for Higher Education (CHE) / Planning and Budgeting Committee (PBC) allocated to the Mediterranean Sea Research Center of Israel (MERCI) is a serious error, even if the conduct of the MERCI itself and its other stakeholders needs improvement.

Against the background of the existing manpower crisis in the Israeli merchant fleet, it is necessary to increase the number of Israeli cadets and officers at **The Israel Nautical College - Akko**, which in practice does not occur.

Seventh Recommendation – Formation of Israel's Foreign Policy in the Middle East and the Red Sea

Israel's interests in the Middle East must be re-examined, to determine the best policy for realizing the interests of Israel and its closest ally, the United States. To do so, we must identify common allies and examine the opportunities and risks presented by the increasing Russian presence in the Middle East. The areas in which cooperation

between Israel and Russia can be continued should be identified, as should any cases in which the United States may also have common interests.

Recent events in the **southern Red Sea** have made this area unstable, and to some extent have also raised the level of risk to shipping. The State of Israel, a large part of whose exports and imports are with Asian countries, must establish appropriate security policies that will translate into the israeli navy missions, in order to protect these vital shipping lanes. In this context, joining multinational forces operating in the region should also be considered.

Israel has no interest in **securing tanker lanes in the Hormuz Strait**, since it has not been importing fuel from Iran since the fall of the Shah's regime. It is unnecessary to open another front with Iran through open declarations of Israel joining this mission.

The reconciliation agreement with Turkey, signed between Jerusalem and Ankara in 2016, did not produce the expected results, and Turkey has become Israel's **adversary** in the international arena. Recent declarations by Turkey's leaders on the expansion of the Turkish economic waters, especially with regard to the Cyprus region, could lead to incidents between the navies of both countries. It is necessary to examine the long-term geopolitical interests of Israel and Turkey, including the field of gas trading, and to formulate an overall policy on the issue, including the nature of the response at sea.

Against the backdrop of the **regional challenges faced by the State of Israel in the Middle East**, including the strengthening of Iranian influence in the Syrian region, relations with Turkey under the Erdoğan regime warrant an assessment of **Israel's regional alliance with Greece and Cyprus as counterweight**.

The Security Cabinet of Israel decision 732 of October 7, 2019 on **foreign investment in Israel** was due, among other things, to the implications, raised in previous reports by the HMS and the Hudson Institute of political studies in the United States, of the contract signed by Israel with the Chinese company SIPG to operate the Haifa Bay Port for 25 years. There is a fundamental problem in a foreign player operating an infrastructure essential to the State of Israel, but at least, a mechanism and process for addressing similar issues in the future has been created.

Eighth recommendation - dealing with rogue states and terrorist organizations in the maritime space

Recent events in the southern Red Sea and the Persian Gulf must be studied closely where proxies and militias such as the Iranian Revolutionary Guards have deployed asymmetrical and hybrid naval methods of warfare, require the formulation of

appropriate operational responses to deal with them and such responses should be studied.

1. One has to ask what the consequences may be of such actions by organizations such as those in the coastal waters of the Gaza Strip, Syria, Lebanon and Libya in the Mediterranean, or in the waters of the southern Red Sea.
2. It is important for the **intelligence community** to understand the implications of a possible link between international terrorism and the proliferation of weapons of mass destruction and advanced weaponry.
3. Israel must operate internationally, especially with Russia, to prevent the further development of Iran's naval outposts in Syria's ports.
4. We must consider how the recent events in the region affect Lebanon, and what the consequences of the presence of advanced Iranian naval forces and army weponary in Lebanon may be.
5. Cooperation with the Egyptian Navy in dealing with maritime terrorism, especially in the Red Sea, should be tightened.

Ninth Recommendation – Promotion and Regulation of Law and Maritime Law

When a new government is established in Israel, it will be important to complete the legislation as soon as possible with regard to the **Exclusive Economic Zone Law - 2017** (hereinafter: the "bill"), as approved by the Ministerial Committee for Regulation, approved by a Cabinet decision, approved by the Ministerial Committee on Legislation and by The Knesset's first and second readings[18]. it is important to regulate the application of Israeli law to the maritime areas at this time, as failure to promote the bill may expose the state to international legal proceedings, that will be needed to develop the gas fields beyond territorial waters. it is also important to regulate the National Planning and Building Law 1965 - which in its present form does not meet deep sea activity requirements.

The bill, as approved by the ministerial committees, should be promoted, while attempting to reach as broad a consensus as possible among the professional bodies, until its final legislation in the Knesset as soon as possible. Political agreement must be sought at the points of overlap of the exclusive economic zones with neighboring countries, and preparations must also be made for the absence of political agreement, according to the rules of international law.

18 This is the first and second stage of proposing a bill in the Knesset.

Concerning **the demarcation of the Israeli-Lebanese border** on the basis of the work of Dr. Benny Spanier conducted in the first half of 2019 and presented to the Israeli government officials responsible for the issue[19], We recommend separating the maritime and continental conflicts, that is, separating the border issue at Rosh HaNikra (Head of the Grotto) from the other land points in dispute. We recommend a first priority—assuming that no direct negotiations can take place—to reach a compromise by way of arbitration, the benefits of which are several: the parties can set their own discussion framework, both procedurally and in the scope of the solution options; in this context, various proposals can be made that do not have to be according to the Law of the Sea treaty (UNCLOS); the methodology of setting the boundary can also be debated; the parties will hopefully be able to agree on the mediators, thus preventing the intrusion of non-party foreign parties in the proceeding; it will not be possible to impose a solution on Israel; the arguments regarding the proposed boundary line can be raised, even if seemingly unacceptable in terms of the law of the sea; the mediation can be a way of compromise between the parties.

Tenth Recommendation – Incorporating the Maritime Policy & Strategy Research Center (HMS)

Engaging in strategic and policy issues in the Maritime Domain requires unique interdisciplinary knowledge that is not currently available in Israel.

The Maritime Policy & Strategy Research Center (HMS) acts, among other things, as a focal point for interdisciplinary, independent research in the field of marine strategy, in the broad sense of the term, with an emphasis on Israel and its marine environment in the Mediterranean and the Red Sea.

Over the years, the HMS has developed a strong relationship with centers and institutes in the US, India, France, Germany, Singapore and with experts in the field, with the ability to contribute greatly to the international maritime strategic discourse in which Israel takes part.

This situation has long allowed the State of Israel to rely on the professional and scientific knowledge that already exists at the HMS, and to invest the resources needed to enable researchers working there to carry out future applied research in the most relevant areas, thereby continuing to contribute to strengthening Israel's maritime position.

19 Benny Spanier, *Peacefully - Examining the Israel-Lebanon Maritime Conflict according to the Law of the Sea treaty* Chaikin Cathedral and the Center for Maritime Policy and Strategy at the University of Haifa, July 2019.