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Marine Industries



I. History and Background

Iran with 8500 km coastal line and access to some international strategic waterways is an important country. Since ancient times, Iranians have always been actively involved in marine and its related industries. Ancient Iranian civilization mostly owes its progress to shipbuilding industries. Iran's rich offshore oil and gas reservoirs are also another added advantage for Iranian marine industries.

Maritime industry in Iran comprises a wide range of varying areas such as shipbuilding, offshore structures, fisheries, transportation, ports, and tourism; hence, it is considered to be one of the most strategic sectors of the country.

Shipbuilding

Iran's tanker fleet has a capacity of 16 million tons and is the second large tanker fleet in the world; increasing the capacity of cargo ships, it mounts to 21 million tons. In fact, the Islamic Republic of Iran Shipping Lines (IRISL) is the biggest merchant company in the Middle East and it operates about 160 vessels with average lifetime of 14 years and annual capacity of over 5 million DWT. Also, the National Iranian Tanker Company (NITC) with 46 carriers and tankers is the fifth largest tanker fleet in the world.

It is also worth mentioning that according to 2013 Clarksons Research, the world overall shipbuilding capacity is over 45 million CGT, of which Iran's share is estimated to be 0.27 percent.

Offshore Structures

Iran's long water borders and huge offshore oil and gas resources along with its massive hydrocarbon reserves in the Caspian Sea and the Persian Gulf make the country's offshore industry highly important particularly over the last two decades. The Persian Gulf with more than 55 percent of the world's oil reservoir and over 40 percent of gas reserves is undoubtedly of great significance in the international economy.

One of the major projects of the offshore industry is the Persian Gulf Bridge which connects Qeshm Island to the main land through a suspended deck and gravity-based structures.

Ports

Nowadays, the international marine transportation accounts for over 90 percent of the global trade transportation whereas the other forms of transportation including road, railroad and air add up to



only about 10 percent. Currently, ports of Iran are gates for 95 and 85 percent of the country's import and export, respectively. Iran has 11 major ports and 82 small and multi-functional ports on the north and south coasts. Many of the ports are production centers in addition to their major contribution to trade. Consequently, most of the important economic activities are carried out in the country's ports. Asaluyeh port, for instance, which has housed different phases of the South Pars project since many years ago- its new phases are well on the way to being completed- has become the energy hub of the country. This port is globally known as a leading center in producing petrochemical products. Other ports like Shahid Rajaei and Imam Khomeini facilitate most of the country's international interactions.

Marine Transportation

Iran, with about 5800 km coastal line including its islands, has high potential for marine transportation. Iran as a global trade crossroads is on the north-south, east-west, and central Asian trade corridors and thus being in the heart of global trade corridors, it can play an influential role in cargo transit from Asia to Europe and vice versa as well as to/among the Persian Gulf countries and those in the central Asia. Iran with its big fleet of ocean-going vessels has a total capacity of 15,300,000 DWT and 9.5 percent of the world fleet which promotes it to the 23rd ranking; albeit 10 million tons of Iran's fleet capacity is due to its oil tankers. According to Clarksons Research, in 2013 Iran had 229 ocean-going vessels from which 108 are Iran flagged and the rest operate under other countries' flags.

II. Strategies and Objectives

Major strategies and objectives of this industry inspired by maritime development document in Iran's Vision 2025 plan are as follows:

- Ensuring safety of marine navigation in the Persian Gulf waterways particularly the Strait of Hormuz, the Gulf of Oman, the Caspian Sea, and the open waters focusing on the national fleet;
- Proportionally increasing population on the coasts and islands of the Persian Gulf and the Gulf of Oman up to 4 and 2.5 percent of the total population, respectively;
- Improving sea transportation efficiency at least up to twice as that of present;
- Obtaining nominal capacity of at least 300 million tons in different cargo groups and 14 million TEU containers in the commercial ports of the country;
- Increasing the capacity of Iran-owned merchant fleet at least up to 30 percent (capacity of 30 million tons);



- Increasing share of Iranian fleet from the international sea transport proportional to its capacity;
- Enhancing capabilities of the companies building vessel to secure 1 percent of the international market value with an emphasis on supplying domestic market demands;
- Providing the required platform for 30 million people marine trips in year with average annual growth of at least 7 percent and attracting at least 15 percent of Iranian and foreign tourists to Iran marine tourism;
- Producing at least 1.5 million tons aquatic animals a year, including 1 million ton from fishery and 500,000 tons from aquaculture (inshore and offshore);
- Securing the first place for marine science advancement regionally, technology development, and international patents and staying among the 10 top countries in marine science, technology, and research;
- Developing bunkering to gain 50 percent of the region's fuel market in the Persian Gulf and the Gulf of Oman (at least 8 million tons annually) focusing on fuel domestic vessels while adhering to environmental regulations;
- Developing know-how and technologies of manufacturing equipment for marine detection, exploration, mining and extraction, exploiting and transferring hydrocarbon reserves at the depth of 1000m;
- Obtaining a 50 percent ship repairing regional market share per year with an emphasis on domestic market while considering environmental requirements;
- Supplying at least 70 percent of the required material and equipment from domestic products;
- Increasing capacity and capabilities of the Iranian companies to carry out at least 90 percent of the exploration, extraction, and transfer projects of oil and gas and offshore services;
- Covering at least 50 percent of the Iranian ships under international conventions by the National Unity Classification Society and joining the 10 top registry institutes worldwide;
- Reclaiming at least 10 percent of the captured coasts annually;
- Increasing at least 10 percent to the 4 zones of coasts, islands, and seas under environmental protection and management and improving the existing protection measures considering international standards;
- Exploiting at least 40 percent of the flared gas in offshore and inland oil installations;
- Stabilizing the status of Iran flagged fleet in the regional and international MoU white listing of ships' technical and safety control and inspection, and aiming to decrease the marine accidents of the Iran flagged fleet in the Iranian ports and territorial waters at least 5 percent annually.



III. Capacities and Capabilities

A. Human Resources

Here, various marine disciplines of Iranian universities are categorized into three groups of technical and engineering (marine engineering, offshore structures, etc.), marine sciences and fishery (fishery, marine physics, biology), and humanities (maritime business management, economics, etc.).

Table 1

Marine Students in Different Levels and Disciplines in 2014

Discipline	Level		
	B.S.	M.S.	Ph.D.
Technical and Engineering	1971	2161	149
Marine Sciences and Fishery	3131	614	95
Humanities	1362	100	4
Total	6464	2875	248
Sum Total	9587		

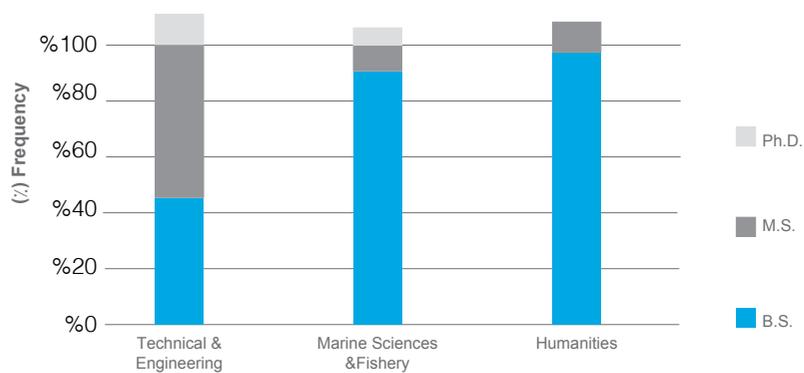


Figure 1: *Distribution of Marine Students in 2014*



Jamaran Battleship

Table 2
Marine Faculty Members in 2014

Active Marine Faculty Members	Ranks				Total
	Instructor	Assistant Professor	Associate Professor	Full Professor	
	73	143	26	23	265

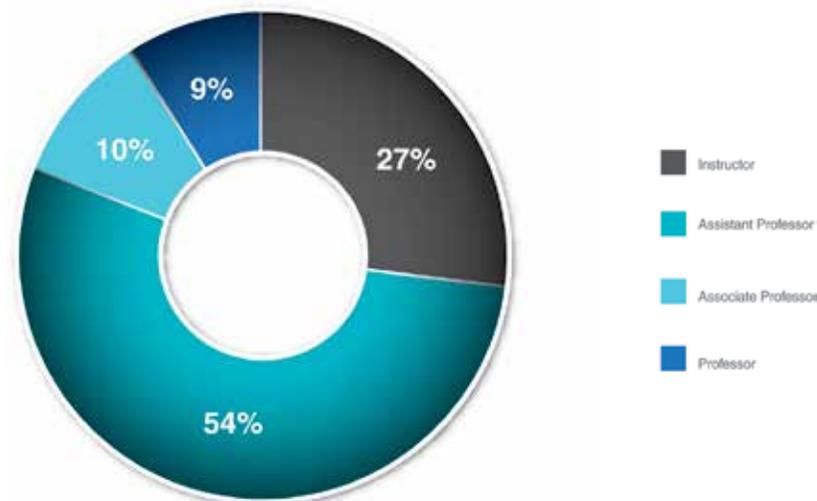


Figure 2: *Marine Faculty Members in 2014*

B. Scientific Productivity

In recent years, Iran has experienced a significant progress in marine science advancement and improved its rank from 24 to 9 within 16 years (table 3). Iran also stands at the first place in the Middle East with other countries of the region lagging far behind it.



Iran/Arak Container Vessel

Table 3
Iran's Global Rank in Marine Engineering Articles in 2014

	Country	Documents	Citable Documents	Citations	Self Citations	Citations per Documents	H Index
1	China	2533	2424	424	339	0.17	57
2	United States	1565	1389	296	163	0.19	135
3	India	655	640	90	39	0.14	42
4	United Kingdom	635	548	136	58	0.21	81
5	South Korea	568	552	58	23	0.10	43
6	Norway	381	372	53	35	0.14	56
7	Japan	381	372	46	18	0.12	53
8	Canada	363	348	33	16	0.09	62
9	Iran	342	326	58	33	0.17	33

C. Some Achievements

• Naval Vessels (Jamaran battleship)

Jamaran battleship is the symbol of Iranian engineers' expertise in maritime defense industry. Constructing this advanced ship has strengthened the self-esteem and confidence of the Iranian specialists and its launching paved the way for building several more required naval vessels. Along with Iran's self-sufficiency in producing most of its maritime defense equipment, its military presence in international waters in recent years is undoubtedly one of the factors of establishing Iran's marine position in the region and the world as a great power. Recently, Damavand naval vessel, designed and constructed by the Iranian engineers, has joined the potent fleet of I. R. Iran Navy in Mazandaran province- the Caspian Sea.

• Ocean-going Ships

As 90 percent of I. R. Iran exports and imports are conducted through sea and usually using cargo ships, construction of ocean-going container ships has been one of the most significant



accomplishments of the Iranian engineers in the recent years. Iranian ships like Iran/Arak and Iran/Shahr-e-Kord are clear manifestations of Iran's great potential in maritime industries. These vessels are currently operating in the IRISL Group.

• Tanker Vessels (Aframax)

Iran's great volume of oil exports makes design and construction of oil tankers a top priority for the country. Constructing Aframax ship, ordered by Venezuela, is one of the biggest maritime projects proving Iranian engineers' considerable expertise. Aframax, designed and constructed in collaboration with South Korean engineers, can carry 113,000 tons of oil (750,000 barrels) with the maximum cruising speed of 29.6 k/h thanks to its powerful engine-a 15820 KW (21206 HP) engine.

• Offshore Oil and Gas Platforms

Given the large number of Iran's oil and gas fields in the Caspian Sea and the Persian Gulf, the offshore industries are of great importance to the country's economy. Due to the highly advanced technology required for constructing oil platforms, Iranian engineers' accomplishment to construct offshore platforms is of great importance.

• Ports

Regarding country's long and strategic coastal lines in the north and south and the fact that about 90 percent of exports and imports are conducted via sea, ports and harbor facilities are of high significance for the country. Iran has been able to significantly develop technology for port design and construction involving environmental studies; designing, constructing, and managing coastal structures, breakwaters, and waterfronts; and creating several ports including development projects of Shahid Rajaei, Bushehr, and Chabahar ports. Eleven major commercial ports as well as fishery and passenger ports with loading and unloading capacity of more than 186 million tons and 14 million passengers have made Iran a leading country in establishing port installations and facilities.

• Large Maritime Transport Fleet

Iran with about 200 ocean-going ships boasts the greatest fleet in the region; hence it is one of the powerful countries in sea transport. Nowadays, Iranian sea transport companies have varying vessels of different sizes including tankers, bulk carriers, and container ships which are operating in international markets. In the recent years, NITC has experienced a considerable development and has amassed the world's largest fleet of supertankers.



• Research Vessels

Following big steps towards development of maritime industries, Iran has accomplished to build its first domestically-made ocean-going research vessel, Khaliji Fars (meaning the Persian Gulf). Since most of the parts of this sea explorer are made in Iran, it can be claimed to be totally domestically built. This vessel could be effectively used in investigation and field researches of the country's surrounding seas.

• Submarines

Iran has successfully developed submarine design and construction technologies. Ghadir -a midget submarine- is an example of Iranian accomplishments in this area. Some of the special features of this submarine include: ability to perform missions quickly; long range subsurface navigation; small sonar system; automatic depth control system; manual, hydraulic and automatic navigation system; and capability for navigation in shallow waters. Nahang as the second locally-manufactured submarine is equipped with surface detection radar system and telecommunications tower. Additionally, Iran has built a series of wet and ultra-lightweight submarines called Al-Sabhat. Fateh also is an Iranian-designed submarine of semi-heavy class (527 tons) which now is in service.

• Hovercrafts

Iran has accomplished to design and construct a small hovercraft, called Younes 6, which is basically made of composite. Yet another project of this kind is Tondar. This project involves improving and updating electronic and weaponry systems of the hovercraft. Lately, Iranian engineers have succeeded developing new hovercraft technology and they've been able to design and construct two new variants; military and civilian composite hovercrafts.

• WIG Crafts

WIG crafts -the most important strategic marine rivals- have been used since 2006. Currently, a new generation of WIG crafts named "Bavar 4" has been designed and manufactured locally by the Iranian engineers and specialists.

• Semi-Submersible Drilling Platform

Amir Kabir semi-submersible drilling rig platform -the most advanced platform in the offshore drilling industry- is Iran's first achievement in this area. This drilling platform has been designed and



constructed for oil/gas exploration in the Caspian Sea. All the preliminaries for constructing this drilling platform including detailed engineering activities, workshop drawings, and procurement of advanced drilling equipment and machinery have been performed domestically.

• Jack-Up Drilling Platform

Technical knowledge of designing jack-up drilling platforms is limited to a few companies in the world; however, Iranian specialists have made considerable advances in this field. For instance, the first Iranian jack-up drilling platform, called Iran/Khazar was built 20 years ago and exploited in the Caspian Sea. Currently, several Iranian companies are capable of designing and constructing such platforms.

• Varying Dry Docks

Dry docks are necessary due to the increasing growth of shipbuilding industry including construction and maintenance of marine structures such as huge ships. State-owned and private dry docks providing construction and maintenance services for the largest ships have been already constructed in the country.

IV. Authorities

A. Marine Industries and Technology Council

With regard to great importance of maritime arena and the need to focus more on this field, the Marine Industries and Technology Council (MITC) was established in 2014 through the efforts of the Vice-Presidency for Science and Technology. Some of the important strategies and programs of the council are as follows:

Providing support for marine knowledge-based companies to develop technology and enhance marketing process, coordinating and synergizing maritime development programs and supporting national marine projects, supporting development and empowerment of specialized associations and formations for marine knowledge-based products and services, promoting technological entrepreneurship and improving the environment of marine knowledge-based business through holding innovation festivals, supporting student competitions, and selecting top marine theses, etc.

Overall, there are 16 universities providing marine programs and 25 marine knowledge-based companies in the country.



B. Other Authorities

• Iran Marine Industrial Company

The Iran Marine Industrial Company (SADRA) was founded in 1968 in Bushehr. Since then, SADRA has established itself as the leading shipbuilding and ship-repairing company in Iran. This company is specialized in building and repairing different vessels such as container ships, tanker, pipe laying, offshore drilling platform (submersible jack up), fixed offshore platforms, laying subsea pipelines and cables, establishing processing and refinery facilities of gas, oil, and petrochemical, laying gas and oil pipe lines in land, carrying out infrastructure projects, and constructing heavy steel structures and oil terminals, jetties, and harbors.

• Iranian Offshore Oil Company

The Iranian Offshore Oil Company (IOOC) is one of the world's largest offshore oil producing companies with over a half century of experience. This Company is responsible for extraction and exploiting oil fields of the country throughout 1200 km² of the Persian Gulf and the Oman Sea.

• Iran Shipbuilding and Offshore Industries Complex Company

The Iran Shipbuilding and Offshore Industries Complex Company (ISOICO) is operating in various areas including designing, building, and repairing all types of vessels up to 80,000 tons, and designing and constructing offshore and onshore oil and gas platforms, refineries, and pipelines in the special economic zone.

• Islamic Republic of Iran Shipping Lines Company

The Islamic Republic of Iran Shipping Lines Company (IRISL) with 163 different kinds of ocean-going and service vessels and 5.7 million tons DWT transportation capacity is operating in all international waters.

• Iranian Offshore Engineering and Construction Company

The Iranian Offshore Engineering and Construction Company (IOEC) is one of the widely-recognized ECPI contractors of offshore and onshore oil and gas industry in the region and the world. With 16 years of experience in oil/gas industry, IOEC is a well-established company in the Middle East which has great experiences in engineering, procurement, construction, installation, and operation of marine structures and pipe-laying in sea bed.



• **Industrial Development and Renovation Organization of Iran**

Keeping on its privatization policy and decreasing its role as a corporate, the Industrial Development and Renovation Organization of Iran (IDRO) aims to convert into an industrial development agency.

• **Azim Gostaresh Hormoz Shipbuilding Industry Company**

The Azim Gostaresh Hormoz Shipbuilding Industry Company (AGH) is involved in establishing shipbuilding plants and the related industries; providing facilities and equipment required for building, converting, and repairing ships; renovating various ships and fixed/mobile vessels; building and installing different structures and equipment of ships; building floating roofs and tanks; selling, purchasing and exporting range of ships and the related industrial products and producing the licensed minerals such as sand and gravel as well as technical services; and conducting any form of trade operations and binding domestic/international contracts.

• **Ports and Maritime Organization**

On May 25, 1960, the General Agency of Ports and Shipping was changed to Ports and Shipping Organization and then on April 29, 2008, it was renamed as Ports and Maritime Organization. Some of its key activity areas are as follows:

- Managing ports, commerce, and maritime affairs;
- Creating, completing, and developing ports, commerce and maritime buildings, facilities, dockyards and the related equipment and operating them;
- Managing loading, unloading, transportation, and storage in the ports of the country;
- Managing telecommunications networks (radio, telegraph, telephone, teletype, etc.) on land and at sea to make contact with ships and subsidiary ports and providing the related equipment in collaboration with the former Ministry of Post, Telegraph, and Telephone;
- Fully monitoring coastal and commercial shipping, making great attempts to develop country's shipping and ensure traffic safety, and taking the necessary steps to improve coastal and commercial shipping activities;
- Providing services for management and maintenance of lighting and signs at seas and on rivers in order to ensure safety of traffic of ships and vessels;
- Registration of commercial and recreational ships and vessels with Iranian nationality and implementation of the related regulations.



• Iran Fisheries Organization

The Iran Fisheries Organization, a governmental institution affiliated to the Ministry of Agriculture, was founded in June 2004 with the aim of protecting and preserving aquatic resources and reserves in the waters under the Islamic Republic of Iran authority and jurisdiction as well as implementing tasks stipulated in the law on preservation and exploitation of aquatic resources of the Islamic Republic of Iran and other related regulations.

• Petropars Groups

Petropars Ltd was established on January 27, 1998 along with development of the 1st phase of the South Pars Gas Field in order to contribute to promoting and taking advantage of the capabilities and experiences of the local contractors and transferring project management knowledge and the latest technology into the country. At present, NICO Company -a subsidiary of the National Iranian Oil Company- owns 100% of its shares.

• Pars Oil and Gas Company

The Pars Oil and Gas Company (POGC), a subsidiary of the National Iranian Oil Company (NIOC), was established in 1998. POGC is to develop the South Pars, North Pars, Golshan, and Ferdowsi gas fields as well as the South Pars oil layer in the Persian Gulf.

• Khazar Exploration and Production Company

The Khazar Exploration and Production Company (KEPCO), a subdivision of the National Iranian Oil Company (NIOC), was founded in January 1998. KEPCO is in charge of exploration, development, and production of hydrocarbon resources in the South Caspian Sea and three coastal provinces of Mazandaran, Golestan, and Gilan in Iran. KEPCO supervises all the contracts awarded to local and international companies to study and develop oil fields in the Caspian Sea and monitor environmental issues related to exploration and development of oil and gas reserves.

V. International Cooperation

1. Exchange of design and construction information in shipbuilding industry;
2. Joint cooperation with reliable international companies involved in vessel construction and ocean-going shipbuilding.