

A STUDY ON MAZAGON DOCK SHIPBUILDERS LIMITED, IS ONE OF INDIA'S LEADING DEFENCE PUBLIC SECTOR UNDERTAKING SHIPYARDS UNDER THE MINISTRY OF DEFENCE

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INTRODUCTION

Mazagon Dock Shipbuilders Limited, is one of India's leading defence public sector undertaking shipyards under the Ministry of Defence.

The company primarily undertakes construction of warships and submarines along with outfitting works in its workshops and facilities in Mumbai and Nhava.

Over the years, the company has institutionalised shipbuilding in the country and created opportunities for increasing production capacity by investing in modern technologies and sophistication of the product portfolio, to serve Indian and overseas clients.

The company has the capability for integrated modular construction of warships which substantially reduces construction time.

Subsequently, the ship building capacity has increased from eight to ten warships since 2014 and submarine capacity increased from six submarines to eleven submarines since 2016.

With its increased capacity and well-trained personnel, the company is poised to tap the export markets for marine platforms and heavy engineering products along with offering a wide range of services in shipbuilding, ship repairs and refits

Study on key economic parameters of industry

Naval Platforms	Merchant Ships Platforms	Oil Sector
• Destroyers	• General Cargo Vessel	• Offshore Platforms
• Conventional Submarine	• Multipurpose Support Vessel	• Jack-up rigs
• Frigates	• Offshore Supply vessel	
• Corvettes	• Dredgers	
• Missile Boat	• Passenger cum	
• Offshore Patrol vessels	• Water tankers	

PRODUCTS OF MAZAGON DOCK

Sub Marine

- 1) Design Development Construction Refit Test & Trials of Submarines was the focus of the Second Surveillance Audit for the Submarine Division as per QMS ISO 9001:2015, which was conducted and successfully finished by IR Class on August 27 & 28, 2020.
- 2) According to ISO 9001:2015 QMS Standard, M/s IR Class confirmed that Mazagon Dock Shipbuilders Ltd.'s Submarine Division met the requirements of the standard and had been issued the "

Building Ships Section

- 1) Your business is devoted to putting ISO 9001:2015's quality management systems (QMS) into practise.
- 2) For the purpose of maintaining the QMS in the Shipbuilding Division, 58 Lead Auditors and 74 Internal Auditors were trained to conduct Internal Audits.

- 3) The M/s IRQS audit team completed the Shipbuilding Division's Renewal Audit (Remote) on Mar. 25 and 26. The NCs reported were "NIL," and the "Certificate of Approval" has been recommended to the Shipbuilding Division in accordance with the ISO 9001:2015 Standard by M/s IRQS audit team. Certificate of Approval" on May 30, 2018, with an expiration date of May 29, 2021.

TIMELINE

1774- Small dry dock created in Mazagon for ship repair services to East India Company
1934- Incorporated as a Private Limited Company
1960- taken over by Government of India for Indigenous production of warships for the Indian Navy.
1972- Delivered the first frigate, INS Nilgiri.
1997- Delivered first Delhi class Destroyer under project P-15
2010- Delivered first Shivalik class Frigate under project P-17
2014- Delivered first Kolkata class Destroyer under project P-15A
2015- Launched first Visakhapatnam class Destroyer under P-15B
2017- Delivery and commissioning of first P-75 Scorpene class submarine, INS Kalvari.
2019- Launching of INS Nilgiri, first Frigate of Project 17A.
2020- Equity shares of MDL listed on Bombay Stock Exchange and National Stock Exchange
2021- Delivery and commissioning of third P-75 Scorpaena class submarine, INS Karan

FINANCIAL STATEMENT

Financial Results and Performance Highlights:

PARTICULARS	2020-21	2019-20
REVENUE FROM OPERATIONS	4047.82	4904.84
PROFIT BEFORE TAX		
(BEFORE EXCEPTIONAL ITEMS)	756.06	770.43
PROFIT FOR THE YEAR	479.57	408.48
GROSS BLOCK	1140.39	1101.17
NET BLOCK	806.85	836.35
WORKING CAPITAL	1301.47	1612.05
NET WORTH	2919.06	2581.20
FINANCE COST	8.36	9.26

During the year under review the Company achieved the Revenue from Operations of Rs.4047.82 crore as compared to the previous year Rs. 4904.84 crore. The Profit before tax and exceptional items is Rs. 756.06 crore for 2020-21 as against Rs. 770.43 crore in the previous year.

Income Distribution for the year 2020-21 as against previous year is summarised as under:-

INCOME DISTRIBUTION	%	%
	2020-21	2019-20
COST OF MATERIALS CONSUMED	52.93	51.23
EMPLOYEE BENEFIT EXPENSES	14.04	14.21
FINANCE COSTS	0.18	0.17
DEPRECIATION AND AMORTIZATION	1.28	1.25
EXPENSES		

SUB-CONTRACTING CHARGES	8.54	13.54
POWER & FUEL	0.24	0.30
EXPENSES RELATED TO PROJECTS	3.62	2.06
OTHER EXPENSES	2.46	2.52
PROVISIONS	0.43	0.70
EXCEPTIONAL ITEMS	2.71	0.22
TAX EXPENSE	3.23	6.36
OTHER COMPREHENSIVE INCOME	-0.29	0.31
TOTAL COMPREHENSIVE INCOME	10.61	7.12
TOTAL	100	100

Contribution to Central Exchequer:

- Your Company's contribution during 2020- 21 to the Central Exchequer by way of income tax GST IGST on imports and custom duty was Rs. 722.69 crore.

Public Deposits:

- The Company has not accepted any deposits from public and as such no amount on account of principal or interest on deposits from public was outstanding as on the date of the balance sheet.

Loans Guarantees or Investments:

- Your Company has not given any loans guarantees or made any investments under section 186 of the Companies Act 2013.

Review of Operations:

- MDL Company recorded a Revenue of Rs. 4047.82 crore for 2020-21 as against Rs. 4904.84 crore of the previous year.
- At present MDL is handling two Shipbuilding projects for Indian Navy comprising off our ships of P15B & four ships of P17A each. Besides MDL is also handling construction of six Scorpene class Submarines for the Indian Navy out of which three Submarines have already been delivered

PROJECTS OF MDL

1. Capital Projects and their progress

- Your Company has undertaken construction of a new state-of-art Security Complex at the main entrance at an estimated cost of Rs. 29.10 Cr.
- This G+Two storey building will be equipped with latest security equipment gadgets access control etc.
- This Complex will be the centralised hub for key MDL departments such as Security PRO
- Safety Fire Estate and HSE for effective coordination. The project is expected to be completed by Mar 2022.
- Your Company has undertaken the work of Submarine Launch Facility to facilitate load out/launch of fully constructed submarine from the Submarine Assembly Workshop at Alcock Yard at an estimated cost of Rs. 174.84 Cr.

The project is expected to be completed by Dec2021.

- Your Company is committed towards up gradation / modernisation of existing facilities from time to time. The company has decided to replace existing 12 nos.
- Vintage LL cranes by new cranes in a phased manner. In first phase replacement of 03 LL cranes at South Yard has been initiated.
- Company has also initiated the work of replacement of old Caisson Gate of East Yard Dry dock by new Caisson gate.
- On completion of these projects productivity and safety at work will improve.

Mazdock Modernisation Project:

- Your Company has successfully put in to use its infrastructure under Mazdock Modernisation Project (MMP) comprising of a new Wet Basin Heavy Duty Goliath Crane Module Workshop Cradle Assembly Shop Store Building and associated ancillary structures.
- Submarine Section Assembly (SSA) workshop an eco-friendly green concept building has already been completed and put into use.

2. Other infrastructure projects:

- Your Company is committed towards up-liftmen of under privileged sections of society and towards this a skill development hub is being created with an Apprentice Training School (ATS) along with residential accommodation for security staff and associated development work at Gavhan village Navi Mumbai at an estimated cost of Rs. 150.00 Cr.
- Your Company is committed towards fire safety of the Yard and towards this the company as initiated the work of installation of the state-of-the-art Fire Fighting System of Anik Chembur yard which will

enable to protect the valuable material stored at Anik Chembur Yard at an estimated cost of Rs. 15.50 Cr. Company has also replaced piped services of Mumbai Yard towards fire safety.

- Recently Your Company has commissioned a new Canteen facility with a seating capacity of 500 workers a major infrastructure addition undertaken in the current year.
- The progress of all the ongoing projects has been severely impacted due to the prolonged pandemic situation worldwide. However, all efforts are being made to projects on priority. 4 Research & Development
- The R&D policy of the Company was approved by the Board in June 2013 and a committee was formed to drive the implementation of the R&D policy in accordance with the guidelines issued (September 2011) by the DPE on R&D. The R&D team is headed by Director (Shipbuilding) and General Manager (Design) is one of the members in the team. MDL is recognised as 'In-house R&D unit' by Department of Scientific and Industrial Research (DSIR) Ministry of Science and Technology from 30 Jan 2017.
- Your Company has executed and completed trials for three major R&D projects through Industry-Academia participation with IIT Madras Chennai through their incubated start-ups belonging to the Tamil Nadu Corridor. Your Company has ventured into the area of Artificial Intelligence (AI) also through these projects. The product developed through the first Project AI enabled weld inspection tool with computerized radiography to replace manual radiography (RT) has been launched during the Defexpo 2020 at Lucknow. The second project fruitfully concluded by developing an AI enabled robotic weld inspection tool employing phased array technique and this can replace computerized radiography in consultation with the Indian Navy. The product was at display during Defexpo 2020. An AI enabled Remotely Operated Vehicle (ROV) is the third project which was also displayed during DEFEXPO 2020. This AI ROV can detect and classify underwater images thus making the inspections quick and safe.
- The in-house projects as well as projects in collaboration with academic institutions of repute like Welding Research Institute Trichy IISc Bangalore and NID are all aimed at solving the unique issues faced by the Yard during the detailed design and integration of complex systems into a front-line Naval platform. The specialists' groups functioning under GM(Design)_contributes consistently in the areas of structural analysis ergonomics& HFE noise & vibration Control RCS management propulsion system integration materials and HVAC.
- MDL has validated an innovative shaft alignment procedure wherein the propeller shaft line assembly is completed in the Dry Dock itself leading to significant cost saving to the Yard and reduction in the build period of the vessel.
- In addition to the above MDL has developed the state-of-the-art Basic Design of Naval vessels incorporating advanced and optimized equipment machineries weapon and arrangement etc.
- MDL has initiated implementation of Product Data Management/Product lifecycle Management (PDM/PLM) for the under construction P17A ships.
- Your Company has spent approximately 1.7% of the revenue expenditures as expenditure towards R&D during the FY 2020-21. The various projects undertaken under R&D are elaborated in Appendix 'F'.

Benchmarking

- MDL has a long Legacy of producing about 800 ships of various types. Over the year Quality inspection procedure has evolved to suit the latest construction methodology for Ships & Submarine.
- Presently the 3 tier Quality Management System comprising of self-Inspection by the Production Quality Team constituted from the best qualified executives/ operatives/ staff followed by inspection from QA department and finally by the customer representative (WOT/THIRD PARTY) leaves no scope for any error post completion of any process. Non-conformity management with 3 level monitoring and advising does not allow any anomaly to remain un-attended/un-resolved.
- SQC section is involved in various inspection & trial activities right from raw material stage such as steel plates & profiles inspection skid inspections unit dry survey & its dimensional inspections pressure testing of tanks/ compartments/ systems and inspections pertaining to outfitting blasting painting insulation HVAC Balancing Citadel Habitability for warships along with electrical inspection for merchant ship as per required standard & design detail.
- P17A Ships are being built for the very first time as per "Integrated Construction (IC)" methodology which differ in the very concept of warship building by way of adoption of the modern technology where the blocks are pre-outfitted at different locations before joining to reduce the build period of warships.

MDL IMPORTANCES TO IT

Artificial Intelligence (AI) enabled Robotic Weld Inspection using advanced phased array technique:

Phased Array Ultrasound Technology along with Advanced Full Matrix Capture (FMC) /Total Focusing Method (TFM) shall be implemented for this project.

The simulation assisted AI tools involved will include automated defect recognition features from the data sets obtained for improving the robustness and reliability of inspection. Also, the Ultrasound Testing can be performed along with the welding and hence will significantly improve productivity. The use of robotics will enable the inspection to be performed on difficult areas of ship hull more reliably and reduce time of inspection by avoiding the need for scaffoldings. An ultrasonic phased-array probe is composed of multiple elements usually between 32 and 128 each of which can act as a single ultrasonic transducer.

Self-Reliance on Acoustic Measurements:

MDL has acquired self-reliance in acoustic measurement and its analysis for various equipment which used to be performed by the collaborator in the beginning.

Information Technology:

MDL has completed the following activities during the year under review: SAP implementation

- MDL Intranet Portal database migrated to SAP-HANA database in Jan 2021.
- Digital Signature has been implemented in SAP FLM (File lifecycle Management) system in Aug 2020.

- Development of SAP Fiori applications are under progress.

Latest know how on IT

- MDL implemented Work from Home (WFH) during the Lockdown period for business continuity in Jul 2020.
- MoD guidelines on Safety measures adopted / safety measures followed
- MoD guidelines relating to Information Security are complied with.
- Your Company has achieved the following during the year under review:
- Implemented Video Conferencing system in Board & Conference Room in Mar2021.
- Primary Data centre revamped in Mar 2021.

MDL Welfare Activities

- Life Insurance Coverage:** Your Company has arranged various Group Savings Linked Insurance Schemes which provide financial assistance in case of untimely death (accidental/illness) of an employee while on duty. Besides Group Personal Accident Insurance Scheme has also been in place which provides 24 hours' coverage for compensation in the event of an accident of an employee resulting in death or permanent / partial disability.
 - Medical Scheme:** All the serving employees including their dependent family members are covered under the medical scheme. Hospitalization claims of around Rs. 30.64 Crore were disbursed towards treatment to the employees and their dependent family members during the FY2020-21.
 - Other Welfare Activities:** Your Company also provides number of welfare measures viz. Onsite Dispensary and Occupational Health Centre Hospitalization Wellness Centre Onsite Gym & Club Uniform Monsoon Gears Thoroughly Subsidized Canteen Facility Scholarship to Unemployed Wards of Employees etc.
 - Post-Retirement Medical Scheme (PRMS):** In order to provide medical facilities to the retired employees and their spouses MDL Post-Retirement Medical Scheme in place. The same is being regulated through Group Mediclaim policy taken from an Insurance Company.
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- **Executives' Superannuation (Pension) Scheme:** Your Company has introduced a defined contributory superannuation pension benefit Scheme to the executive's w.e.f. 01 Jan 2007. The Company contributes 7% of basic pay + DA toward the corpus of the pension scheme for each eligible executive of the Company w.e.f.01 Jan 2007. MDL has also introduced similar scheme for non-executives and Company contributes 5% of basic pay + DA towards the corpus of the pension scheme for each eligible non-executive of the Company w.e.f. 01 Apr 2012.
 - **Manpower and Reservation of Posts for SCs/STs:** The Company has been following Presidential Directives of the Government with regard to reservation of posts for SCs/STs in recruitments. Total manpower strength as on 31 March 2021 is at 5969 (including functional directors) out of which the

number of persons on temporary rolls was 2282. Of the total strength 101 are Ex-servicemen 826 are of Schedule Caste and 439 are of Scheduled Tribes. The percentage of Scheduled Caste and Scheduled Tribes in respect of Employees was at 13.84% and 7.35% respectively. Number of persons on temporary rolls as on 31 March 2021 is 2282 out of which 334 belong to Scheduled Caste and 200 belong to the Scheduled Tribes category. Details of the statement showing position regarding representation of Schedule Castes and Schedule Tribes in various categories of post on 01 Jan 2020 and 01 Jan 2021 is annexed at Appendix 'A'

- v) **Employment of Women:** As per the recommendation No.51 Para (ii)(a) of the National Commission for Women (NCW) in its Annual Report for the year 1995-96 the employment position of Women as on 31 Mar 2021 is given below as directed by the Ministry of Defence vide their letter Nos.39(6)/99/D(B&C) dated 27 Aug 1999.

Executives

GRADE	NO. OF EMPLOYEES	WOMEN	PERCENTAGE
0	1	0	0
I	21	3	14.29
II	156	15	9.62
III	107	12	11.21
IV	341	18	5.28
V	202	6	2.97
VI	105	10	9.52
VII	43	5	11.63
VIII	18	-	0
IX	5	-	0
CVO ON	1	-	0
DEPUTATION			
FUNCTIONAL	3	-	0
DIRECTORS			
CMD	1	-	0
TOTAL	1004	69	6.87

Non-Executives (Operative)

GRADE	NO. OF EMPLOYEES	WOMEN	PERCENTAGE
WG-0	0	0	0
WG-1	21	0	0
WG-2	215	0	0
WG-3	13	0	0
WG-4	153	0	0
WG-5	2191	52	2.32
WG-6	812	18	2.17
WG-7	339	9	2.59
WG-8	347	0	0
WG-9	164	0	0
WG-10	36	0	0
WG-3A	8	0	0
WG-4A	133	0	0
TOTAL	4432	79	1.78

➤ **Non-Executives (Staff)**

GRADE	NO. OF EMPLOYEES	WOMEN	PERCENTAGE
SI-00	0	0	0
SI-01	0	0	0
SI-02	2	0	0
SI-03	1	0	0
SI-04	0	0	0
SI-05	223	27	12.11
SI-06	53	8	15.09
SI-07	22	4	18.18
SI-08	31	1	3.23
SI-09	28	2	7.14
SI-10	62	9	14.52
SI-3A	3	0	0
SI-4A	29	0	0
TOTAL	454	51	11.23

- **Persons with Disabilities (PWD)** As On 31 Mar 2021: The total number of physically challenged employees as on 31 Mar 2021 was 110 and its percentage to total employees works out to 1.84%.

	HI	LD	VI	TOTAL
GROUP-A	8	13	8	29
GROUP-B	0	0	0	0
GROUP-C	9	67	5	81
TOTAL	17	80	13	110

HI- Hearing Impaired

LD-Locomotive Disability

VI-Visually Impaired.

➤ Industrial Relations

- Industrial relation scenario during this period was cordial and harmonious. There were no man-hours lost on account of Industrial conflict. In the absence of a recognized Union efforts were made to resolve issues of mutual concern through deliberations with the Unions on the Bargaining Council and other unions.
- The Meetings with the Unions on Bargaining Council are being held on regular basis and issues of mutual concerns like safety precautions issues relating to Covid19 pandemic Recruitment of Fixed Term employees etc. are settled through bilateral negotiation process.
- The various issues raised by the Unions on Bargaining Council regarding Covid19pandemic Attendance/Leave Management/ Rotational deployment of manpower has been resolved and Industrial Relations & Labour situation at MDL Mumbai in general is normal and peaceful.

➤ Reservation of Posts

Your company has been observing all the Government directives and instructions issued from time to time on reservation of posts for SCs / STs / OBCs. All the rosters of SC / ST/ OBC / PWD are maintained which is inspected by the respective Liaison Officer from time to time and perused by the SC/ST Unions also. Detailed statistics regarding the total number of employees number of women employees recruitment made during the calendar year2020 and the representation of SCs / STs / Ex-servicemen as on 01 Jan 2021 are given at Appendices A B & C to this Report.

➤ **Grievance Redressal Committees for SCs/STs:**

Weaker sections of the society are given adequate protection in the form of just and equitable treatment at the hands of employer. To ensure the same a separate "Grievance Redressal Cell" has been constituted for SC / ST employees. A quarterly meeting of representatives of SC/ST is held with Director (CP&P) wherein grievances related to SC/ST are discussed and resolved.

SWOT Analysis of Mazagon Dock Shipbuilders

1) Strengths of Mazagon Dock Shipbuilders

- Mazagon Dock Shipbuilders, being one of the leading companies in its industry, has several benefits that help it flourish in the marketplace. These strengths not only help it retain market share in existing areas but also help it break into new ones.
- Leading Manufacturer of Indian Navy: Mazagon Dock Shipbuilding is the leading public sector of defence, in India. They manufacture various submarines and Naval ships for the Indian navy.
- Public Sector: Mazagon Dock Shipbuilding was taken over by the government in 1960. Therefore, Mazagon dock rapidly became the premier war shipbuilding yard. Being taken over by the government helps to grow faster and it helps to increase the capital of the company.
- Use of Modern Technologies: Mazagon Dock Shipbuilding uses modern technologies to manufacture various warships and submarines. And they also build these modern technologies in their shipyard situated in Mazgaon, Mumbai.

2) Weaknesses of Mazagon Dock Shipbuilders:

- Mazagon Dock Shipbuilders' weakness is an area where he can improve. Strategy is about making important decisions, and weaknesses are areas where a company could improve with the help of a SWOT analysis.
- Inefficient Use of Shareholder Funds: Shareholder funds is known as the amount of equity in a company that belongs to the shareholders of the company. Proper and efficient use of shareholder funds is required to expand the company and make more profits. While Mazagon Dock Shipbuilding is not making the proper use of these shareholder funds hence they are not earning the profit that they were supposed to get.
- Inefficient Use of Assets: Mazagon Dock Shipbuilding is not using its assets properly and efficiently, causing less profit gain. This can cause the company various troubles and also loss of shareholders.

3) Opportunities for Mazagon Dock Shipbuilders:

- Opportunities are possible areas for a company to consider to improve results, sales, and, ultimately, profit. Mazagon Dock Shipbuilders includes the following opportunities:
- Stocks with Low PE: Stocks that have low price earnings are known as undervalued. Mazagon should lower the PE below 10 so that the people will tend to invest more in the stocks of Mazagon Dock Shipbuilding.

Threats to Mazagon Dock Shipbuilders:

- Many factors can affect your business outside its immediate environment. Some of these include factors such as a shortage of skilled workers or a supply chain issue. The threats Mazagon Dock Shipbuilders is facing are as follows
- **Competition:** In the current scenario, the Government is also working along with the private sector in a contract-based method. This is a threat to the public sector as their number of orders are decreasing. This is also affecting Mazagon Dock Shipbuilding as there are many private sectors manufacturing the same products in less time and less amount.
- **Many War Policies:** There are many war policies introduced that restrict the number of war objects a country can have. Therefore, the production of warships and submarines are limited and it can't be exceeded after some point. This is a huge threat to Mazagon Dock Shipbuilding and other similar companies.

SUMMARY

- Mazagon Dock Shipbuilders Limited, Mumbai, an ISO 9001: 2015 Company is one of the leading shipbuilding yard in India. The History of Mazagon Dock dates back to 1774, when a small dry dock was constructed in Mazagon. Over the years, MDL has earned a reputation for quality work and established a tradition of skilled and resourceful service to the shipping world in general and the Indian Navy & Coast Guard. It was incorporated as a Private Limited Company in 1934.
- After its takeover by the Government in 1960, Mazagon Dock grew rapidly to become the premier war-shipbuilding yard in India, producing warships for the Navy and offshore structures for the Bombay High. It has grown from a single unit, small ship Repair Company, into a multi-unit and multi-product company, with significant rise in production, use of modern technology and sophistication of products. The company's current portfolio of designs spans a wide range of products for both domestic and overseas clients. Since 1960, MDL has built total 799 vessels including 26 warships, from advanced destroyers to missile boats and 6 submarines. MDL had also delivered cargo ships, passenger ships, supply vessels, multipurpose support vessel, water tankers, tugs, dredgers, fishing trawlers, barges & border out posts for various customers in India as well as abroad. MDL have also fabricated and delivered jackets, main decks of wellhead platforms, process platforms, jack-up rigs etc

REFERENCES

1. MDL Site MAIN PAGE
2. YOU TUBE
3. Wikipedia