



एक कदम स्वच्छता की ओर

माझगांव डॉक शिपबिल्डर्स लिमिटेड

(भारत सरकार का उपक्रम)

Mazagon Dock Shipbuilders Ltd.

(Formerly Mazagon Dock Limited)

(A Govt. of India Undertaking)

CIN : U35100MH1934GOI002079

डॉकयार्ड रोड, माझगांव, मुंबई - 400 010

Dockyard Road, Mazagon, Mumbai - 400 010

Certified - ISO 9001-2015

संदर्भ क्रमांक

Ref. No.

दिनांक

Date

18 Oct 2022

To
BSE Limited
Phiroze Jeejeebhoy Towers
Dalal Street,
Mumbai- 400 001
Scrip Code: 543237

To
National Stock Exchange of
India Limited
Exchange Plaza, C-1, Block G
Bandra Kurla Complex
Bandra (E), Mumbai - 400 051
NSE Symbol: MAZDOCK

Sub: Intimation under Regulation 30 of SEBI (Listing Obligations and Disclosures Requirements) Regulations, 2015 –Publication.

Dear Sir,

1. Further to our letter dated 14 Oct 2022, articles on Mazagon Dock Shipbuilders Limited to be published during DEFEXPO 2022 are attached herewith for your reference.
2. This is for your kind information.

Thanking You,
Yours Faithfully,
For MAZAGON DOCK SHIPBUILDERS LIMITED

VIJAYALAKS Digitally signed by
VIJAYALAKSHMI
HMI KAMAL KAMAL KUMAR
KUMAR Date: 2022.10.18
18:02:43 +05'30'

(Vijayalakshmi Kumar)
Company Secretary

Encl: as above (3 articles)



IRQS
A DEPARTMENT OF
INDIAN REGISTER OF
SHIPPING

फोन +91(22) 2376 2000
Phone +91(22) 2376 3000
+91(22) 2376 4000

फैक्स (Design) +91(22) 2373 8159
Fax (Material) +91(22) 2373 8151
(Finance) +91(22) 2373 8338

(Proj-C) +91(22) 2373 8147
(East Yd.) +91(22) 2373 8333

वेबसाईट : www.mazagondock.in
Website : www.mazagondock.in

Mazagon Dock – First Indian Shipyard to introduce Augmented Reality

Digital Technologies has tremendous capabilities in eliminating unnecessary rework, as well as improving the delivery timelines and quality of construction of Naval Vessels.

Mazagon Dock Shipbuilders Ltd (MDL) has been a thought leader in incorporating digital technologies as part of its Industry 4.0 Initiatives.

MDL was the first Shipbuilder in India, to introduce the use of Virtual Reality (VR) for ship design reviews and approvals by the Navy. This alone has helped reduce timelines for finalizing approvals of design by almost 2-3 years for every project.

“The use of Industry 4.0 technologies like Augmented Reality (AR) and Artificial Intelligence (AI) are a game changer. We can now provide access to 3D design models to production and inspection teams working on the actual vessel. It enables them to see each and every inch of design details in 1:1 scale by superimposing the model data on the physical ship.”

The advantages are very clear. With the digital model on the shop floor, you eliminate communication gaps between production teams and design teams as well as our valued customers.

There is also no risk of production teams using outdated drawings, which was typical when they used paper drawings. The technology is ground breaking and cost effective since it is based on Commercial off the Shelf (COTS) handheld technology.

“We are proud to inform that the complete technology has been developed indigenously as part of the Hon’ble PM’s Atmanirbhar Bharat and Digital India initiatives.”

To give users the actual experience the demo is displayed at MDL Stall at DefExpo 2022.

Mazagon Dock is signing 24 MoUs at DefExpo 2022

Mazagon Dock Shipbuilders Limited (MDL), nation's premier shipbuilding yard will be entering into as many as 24 MoUs with various national and international firms at DefExpo 2022, Gandhinagar. The MoUs are focusing on cooperation in the fields of indigenized development and manufacturing of equipments for ships and submarines and other platforms under 'Atma Nirbhar Bharat'.

Few MoUs are also aiming at design and development of Drones, Autonomous Underwater Swarm Drones, EPC projects in the field of Infra, Railway, Oil & Gas, water treatment, energy and other innovative projects. They also have a target to commercialize the CO2 absorber, steering console, Fuel Cell etc. which are presently used in Defence Industry only.

In addition, technical collaboration in designing processes as technology support partner, training personnel for skill upgradation, improving design quality and reducing the timelines for the completion of design activity, technology upgradation in production processes, AI based implementation of Digital Inspection process are some key areas which are catered under the above MOUs.

The MOUs would be signed with BHEL, Ray Enterprises, IMI Control Component India Pvt Ltd, Godrej & Boyce Mfg. Co Ltd, Mahindra Defence Systems, Sushma Electricals, Sagar Defence Engineering Pvt Ltd, Precitech Equipments India Pvt Ltd, Sunlux Technovations, Elcome Marine, Tata Advanced Systems Ltd, Robosys Automation & Robotics, Pvt Ltd, Qmax Test Equipments Pvt Ltd, Trentar Private Ltd, Yeoman Marine & M/s MATN's Stabiliser, M/s Circor Flow Technologies (I) Pvt Ltd, Aveva Information Technology India Pvt Ltd, Siemens Industry Software India Pvt Ltd, VizExperts India Pvt Ltd, Altair India Pvt Ltd, Suryadipta Projects Pvt Ltd, M/s Dassault Systems (India) Pvt Ltd and National Research and Development Centre.

STRIDES MADE BY MAZAGON DOCK SHIPBUILDERS LTD IN ARTIFICIAL INTELLIGENCE, EXPORTS & DIVERSIFICATION IN SHIPBUILDING

ARTIFICIAL INTELLIGENCE

Artificial Intelligence is the 'disruptive' technology which is often used to describe machines that mimic "cognitive" functions of human mind, such as "learning" and "problem solving" to avoid the errors and inefficiencies. Marrying of an industry which has prehistoric roots, with the latest technology in vogue to leverage its full potential is the real challenge for those attempts to implement the Artificial Intelligence (AI) in Shipbuilding.

Mazagon Dock Shipbuilders Ltd (MDL) has developed three AI projects:

- (a) Artificial intelligence enabled computerized Radiography:
- The storage and preservation of films on reusable imaging plates for which data can be stored in the digital format
 - No darkroom condition, chemical and consumables is required
 - Short processing time
 - Digital films can be stored in computer, cloud or remote network server
 - Using the Computerized Radiography (CR) approach enables efficient archiving of the data with no degradation of the quality of the image.
 - Digital Films cannot be tampered, ensuring more reliable data
 - Very cheap considering the re-usability
 - Environment friendly
- (b) AI based robotic weld inspection tool using phased array ultra sound technic (PAUT):
- Portable
 - Able to detect and obtain the images of defects based on the physics of ultrasonic waves in welded structures
 - Perform robotic weld inspection at area were accessibility is limited. This reduces the requirement of scaffoldings and saves time & cost
 - Perform automated evaluation of defect detection using AI based tools
 - Safe and quick
 - Ease for test set-up
 - Rapid inspections with digital recording of data
- (c) AI enabled Remotely Operated Vehicle (ROV):
- Advanced control system for easy operation
 - Maximum depth rating: 50 m
 - Modern optical and Sonar based survey
 - Hydrodynamic open frame design
 - Assisted obstacle avoidance
 - High thrust and manoeuvrability
 - High definition real time visual system
 - Ultrasonic thickness measurement

- Deployable up to sea state 3

More industry specific AI projects are in pipeline at MDL to meet the increasing demand for automating the processes, cost estimation, planning, procurement and production

ROLE IN EXPORTS

Mazagon Dock Shipbuilders Ltd is the premier Defence Shipyard in India primarily catering to the Maritime Defence of our country by building frontline Warships and Submarines.

MDL in the past had exported 243 numbers of vessels in the Commercial sector to various countries abroad. MDL was fully engaged with Indian Naval Ships for last decade and now focused attempts are being made to enter into the export market both in Commercial and Naval sectors. Accordingly, responses were provided to requirements of various countries and it is hopeful that MDL will be able to bag exports orders in near future

MDL'S export portfolio covers a wide gamut of products comprising of New Builds for civilian and military end-use, repairs of commercial vessels and refits of war vessels. Customized service portfolios wherein MDL can pitch-in as a Know-How Provider for specific needs of developing nations are also in the offer.

Efforts are on for pursuing exports with various countries following both the G2G route wherein the GoI have opened Lines of Credit with funding typically extended by EXIM bank as well as the B2B route with sovereign guarantee of the recipient nation. MDL's rich legacy of building close to 800 ships since inception, a broad spectrum of exports carried out in the past of around 250 vessels, the impeccable quality of the products delivered that has been internationally acclaimed are all being leveraged in a concerted manner for exports.

INNOVATION AND DIVERSIFICATION

MDL has a legacy of Warship and Submarine construction since 1960s with the Nilgiri Frigates being the first of class. The shipyard has undertaken construction of Complex Frontline Warships for Indian Navy, fitted with state-of-the-art machinery and systems. The shipyard has always been the leader in undertaking the construction of the First of Class of all large and complex warships for Indian Navy. Thereafter MDL has guided other DPSU shipyards for follow-on constructions.

MDL committed to pursue application oriented innovative/ research activities in the areas of value addition and product/process up-gradation of warship building, submarines and merchant ships with a view to achieve self-reliance in these areas, practices that are at par with global standards which will also meet the quality aspirations of the customer. MDL always strive to imbibe 'Industry best practices' customized and adopted for the key processes of Shipbuilding.

MDL has entered into collaborations with various institutions and associate with various industries to initiate and carry out innovative/ R&D activities. MDL, in collaboration, developed three Nos of Artificial intelligence enabled projects having wide scope of application.

MDL is conversant with Computational Fluid Dynamics (CFD), Finite Element Analysis (FEM) and developed innovative shaft alignment procedure which are crucial for front line warships. MDL has developed the state-of-the-art basic designs of Naval & Commercial vessels, incorporating advanced and optimized equipment, machineries, weapon and arrangement etc. MDL implemented Product Data Management/Product lifecycle Management (PDM/PLM) for warships under construction. MDL also resorted to Integrated Construction(IC) for P17A ships with the hand holding of Know How Provider for Technology Up gradation and Capacity Enhancement (KHP for TUCE).

Considering MDLs innovation/R&D, MDL is awarded an In- house R&D unit by Department of Scientific and Industrial Research (DSIR) from 2017. MDL is a regular recipient of Golden Pea cock award and SODET award for the R&D innovations implemented at MDL.

As a part of diversification, MDL initiated Commercial ship repair after a long time. MDL is also exploring the possibility of diversifying to other areas also pertaining to Shipping Industry.

MARKETING

MDL is exploring possibility of obtaining Naval and commercial ship orders from regional and upcoming markets in the developing nations worldwide. MDL is engaging the services of agents, Defence Attache, MEA, EXIM Bank, Indian Consulates, Chamber of commerce, ship broking companies in order to identify the requirements.

Efforts are on for pursuing exports with various countries following both the G2G route wherein the GoI have opened Lines of Credit with funding typically extended by EXIM bank as well as the B2B route with sovereign guarantee of the recipient nation. MDL's rich legacy of building close to 800 ships since inception, a broad spectrum of exports carried out in the past comprising about 250 vessels, the impeccable quality of the products delivered that has been internationally acclaimed are all being leveraged in a concerted manner for exports.