

GLOBALLY BENCHMARKED PROUDLY BUILT IN INDIA



THE COMPANY

Larsen & Toubro is an Indian multinational engaged in EPC Projects, Hi-Tech Manufacturing and Services. It operates in over 50 countries worldwide. A strong, customer focused approach and the constant quest for top class quality have enabled L&T to attain and sustain leadership in its major lines of business for eight decades.

Headquartered in Mumbai, Larsen & Toubro Limited is one of the largest and most respected companies in India's private sector. L&T has unmatched capabilities across Technology, Engineering, Construction, Manufacturing and maintains a Leadership Position.

L&T's businesses include Buildings & Factories, Infrastructure, Heavy Engineering, Water & Effluent Treatment, Power, Minerals and Metals, Smart World & Communication, Defence, Shipbuilding, Hydrocarbon, Machinery & Industrial Products, Realty, Financial Services and IT & Technology Services. Team L&T comprises over 50,000 people worldwide.

VISION

To be a global leader in Custom-built equipment, leveraging State-of-the-art, Digitally Enabled Technology with built-in quality to deliver utmost Reliability and Customer Satisfaction.

We will drive Innovation and Sustainability while creating enduring value for Customers, employees, and other stakeholders.



HEAVY ENGINEERING

L&T Heavy Engineering business is global leader in supply of the Engineered to order hi-tech equipment needs of Nuclear power plants, Refinery, Oil & Gas, Fertilizer and Petrochemicals. The business has been at the forefront of introducing digital Industry 4.0 techniques, products and materials into manufacturing sector for over eight decades.

A.M. Naik Heavy Engineering complex at Hazira is globally benchmarked state-of-the-art fully integrated, digitally enabled manufacturing complex.

Our capability spectrum not only covers in-house engineering, R&D centres, and world class fabrication facilities, but also includes a highly talented team, committed to a safe and sustainable work culture. The business achieved international recognition through an impeccable track record of executing large complex projects and constantly creating new international benchmarks.



MISSION

To exceed Customer's Expectations and consistently deliver reliable, custom-built Heavy Engineering solutions while achieving sustainable and profitable growth by :

Securing long-term competitive advantage through Technological Leadership, Process Excellence.

Embedding quality at root, upholding the highest safety standards, and driving Sustainability across all operations.

Targeting Revenue and PAT CAGR > 18% and tripling revenue from Nuclear Business by 2031.

Fostering Total Employee Involvement and a culture of Continuous Learning and Improvement.



L&T Heavy Engineering



PRODUCT BUSES

- Nuclear Power Plant Equipment
- Reactors & Pressure Vessels
- Heat Transfer Equipment
- Special Fabrication
- Process Plant Internals



SUBSIDIARY

- L&T Special Steels and Heavy Forgings



INT'L OFFICES

- Houston, USA
- Shanghai, China
- Sharjah, U.A.E.
- Tokyo, Japan
- Paris, France



INDUSTRY SECTORS

- Nuclear
- Refinery & Cracker
- Oil & Gas
- Fertilizer
- Petrochemical
- Coal Gasification

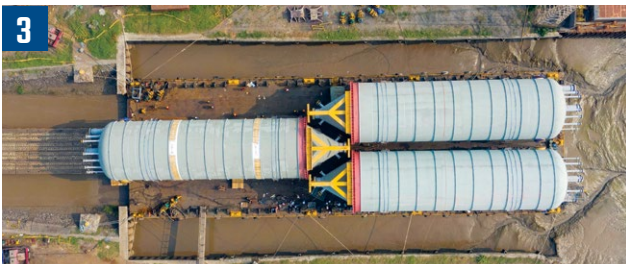


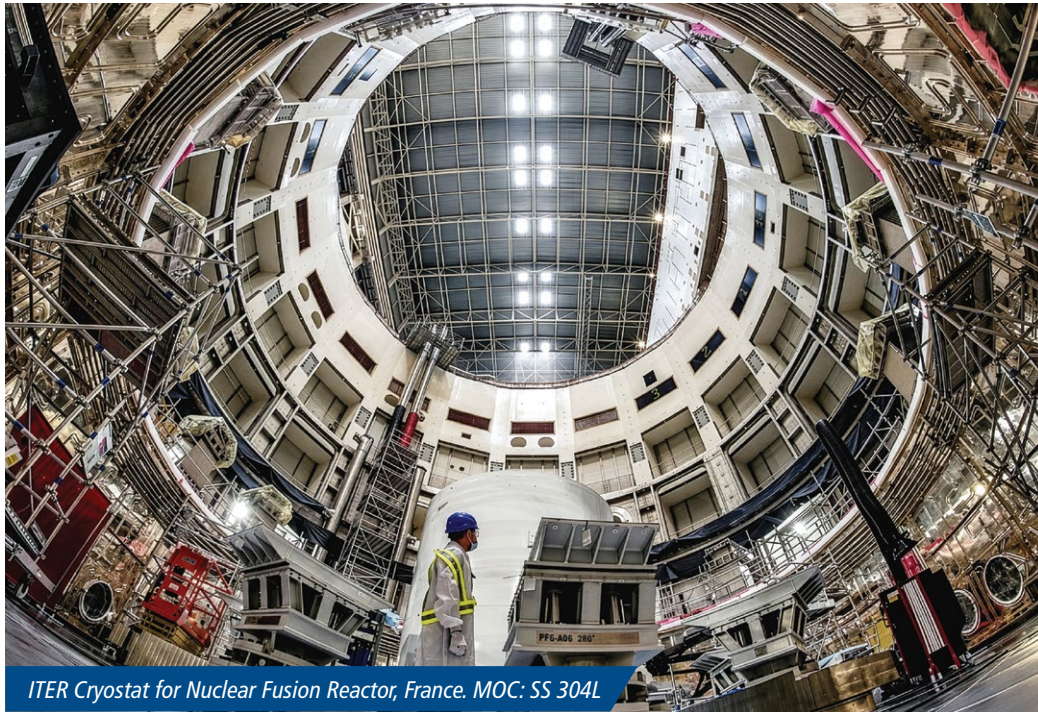
Mfg. FACILITY & Mkt. OFFICE

- Hazira, Surat
- Ranoli, Vadodara
- Powai, Mumbai
- Jubail, KSA

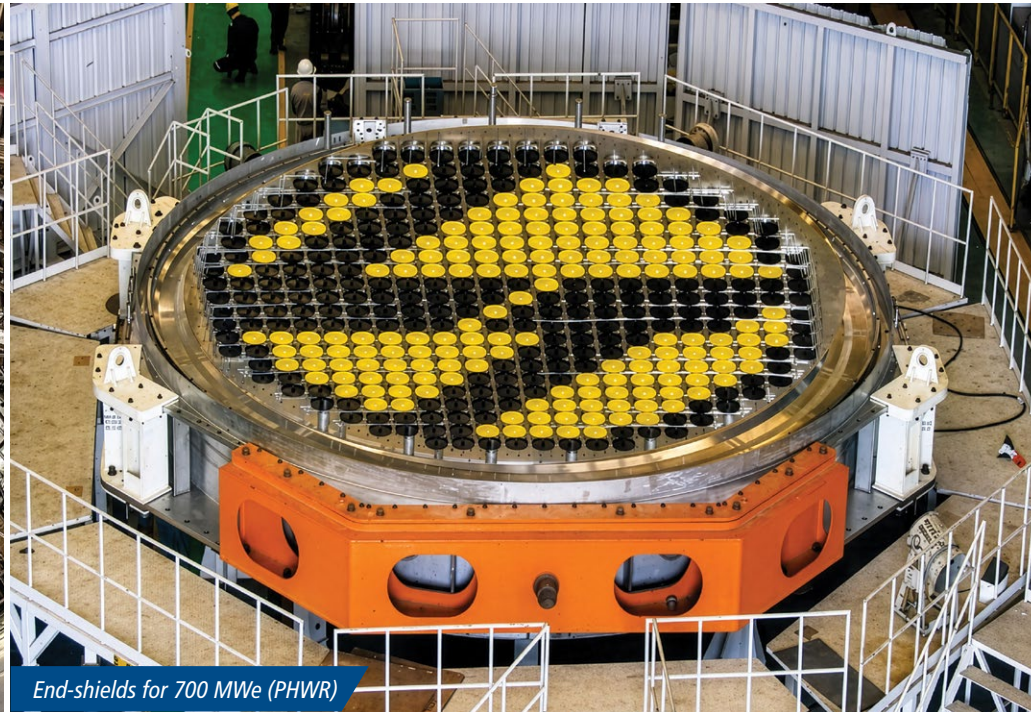
Global Benchmarks

- 33 Months**
Manufactured Nuclear Steam Generators for NPCIL
- 29.4 m Diameter**
The Cryostat - World's largest stainless steel, high vacuum pressure chamber weighing 3,850 Tonnes for ITER, France
- 658 Tonnes**
World's Heaviest Coke Drums - 6 Nos. PEMEX, MEXICO
- USD 421 Mn**
World's Single Largest Order for 22 Reactors for KNPC, Kuwait
- 121 m**
World's Longest Column for Reliance Industries, India
- 2313 Tonnes**
World's Heaviest LC-Max Reactors for HPCL Vizag Refinery
- 16.3 m Diameter**
Largest RFCC Package for Reliance Industries, India
- 1500 Tonnes**
World's Largest Tubular Reactor for Equate, Kuwait





ITER Cryostat for Nuclear Fusion Reactor, France. MOC: SS 304L



End-shields for 700 MWe (PHWR)

NUCLEAR POWER PLANT PROJECTS

Heavy Engineering offers complete solutions for Safety-Class Equipment

• Pressurised Heavy Water Reactors (PHWR)

220 MWe, 540 MWe & 700 MWe

- Steam Generators
- End Shields
- End Fittings
- Safety Heat Exchangers

220 MWe, 700 MWe

- Calandria

700 MWe

- Reactor Headers
- Pressurizer
- Fuel Transfer Equipment

• ITER

ITER Program (Fusion Reactor) with design, development & manufacturing of components / assemblies like Cryostat, Blanket Assembly transporter, port welding & others.

• Cask & Canisters

Spent Fuel Canisters & Casks (for US market under US NRC-10 CFR 50 Appendix B)



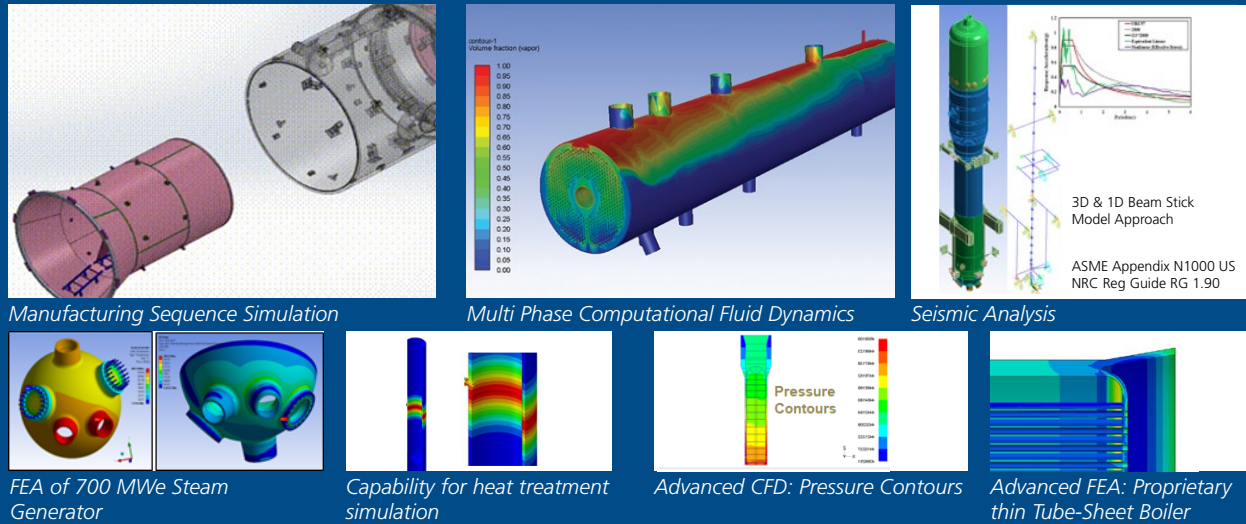
Steam Generators for 700 MWe PHWR Nuclear Power Plant



Reactor Header for 700 MWe PHWR Nuclear Power Plant

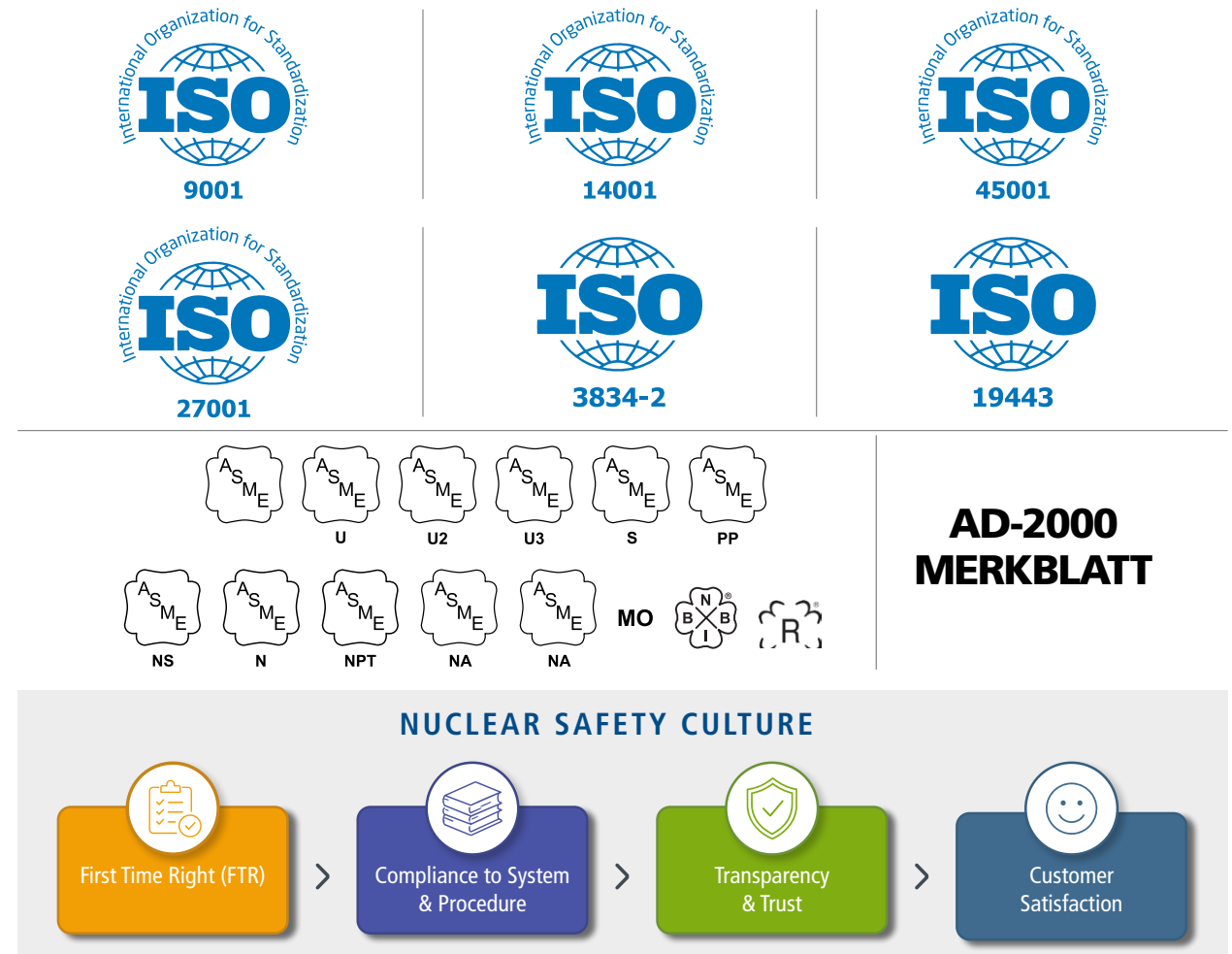
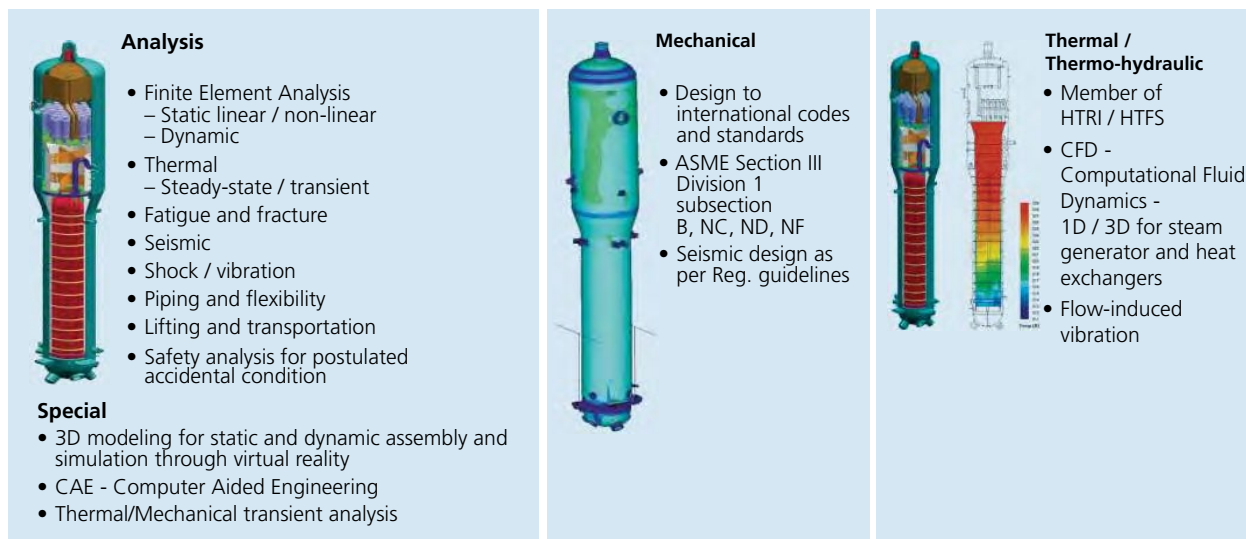


Pressurizer for 700 MWe PHWR Nuclear Power Plant



DESIGN & ENGINEERING: TECHNOLOGICAL EXCELLENCE

L&T's engineering capabilities are geared to design equipment as per customer specific requirements, and international codes and standards. Fabrication drawings for critical equipment are generated through 3D automation which has been developed in-house. The perpetual endeavour of our design engineers is to generate optimum solutions that lead to the lowest capital and operating costs.



UNCOMPROMISING STANDARDS: QUALITY ASSURANCE

The Total Quality Management approach ensures deliveries fully comply with customer specifications. Safety and operational reliability are integral to every system and piece of equipment supplied.

Quality assurance is supported by advanced testing and inspection facilities including, ultrasonic testing, ToFD and PAUT, magnetic particle and liquid penetrant examination, high-pressure and high-vacuum testing, and helium and freon leak testing.

Advanced NDE - ToFD & PAUT Station

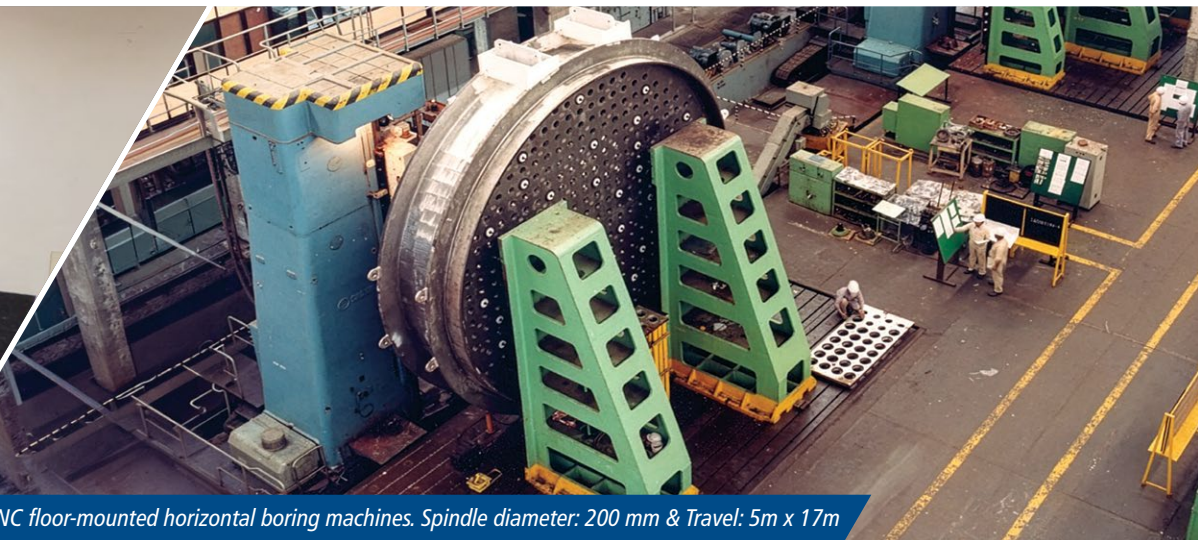
- Compliant to ASME requirements to replace Radiography by Ultrasound (UT).
- Weld Thickness range inspected: 6mm to 800mm
- Fast Inspection due to no Radiation hazard
- No Job handling at assembly stage
- Recordable UT data of weld as base line data to refer in future
- Automatic twin engine Scanner used to straddle the probes along weld length
- Use of AI for interpretation of reportable UT



Plate-rolling machine for hot rolling of plates 300mm max. and 4500mm wide max.



Dust-Free Enclosures - Class 10,000 to 100,000



Three CNC floor-mounted horizontal boring machines. Spindle diameter: 200 mm & Travel: 5m x 17m



WORLD CLASS CAPABILITIES:

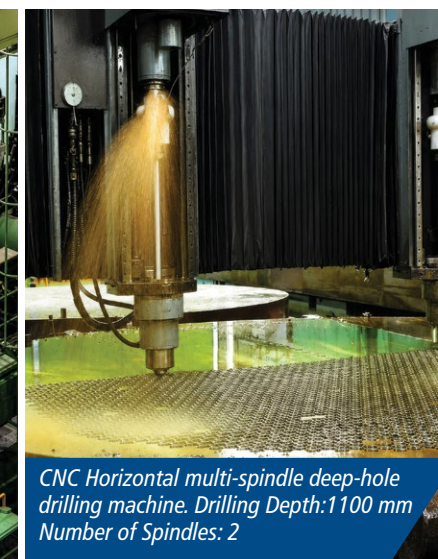
FABRICATION

L&T's world class fabrication capabilities have been achieved through the perfect integration of efficient material handling and preparation, precision machining and welding processes for a range of materials in varying thickness, backed by technological excellence in design, engineering and responsive quality as well as IT systems.

The capabilities of CNC Floor-Mounted and Special Purpose machines are supported by a battery of general purpose machines, all geared to the precision machining needs of a world class fabricator.



CNC Vertical boring machine Max. Diameter: 12m Max. Job Weight: 130 MT



CNC Horizontal multi-spindle deep-hole drilling machine. Drilling Depth: 1100 mm Number of Spindles: 2



CNC Vertical multi-spindle deep-hole drilling machine. Drilling Depth: 900mm Number of Spindles: 2

HEAT TREATMENT

One of the crucial activities in manufacturing of any pressure vessel is Post Weld Heat Treatment. Our workshops are equipped with several large automatic control gas-fired modular furnaces, with dimensions up to 51 m length & 24 m height capable of performing Heat Treatment & stress relieving of sections and equipment of large size. Systematic configuration of gas burners and regulated air flow ensure uniform heat treatment.



COMPREHENSIVE WELDING CAPABILITIES

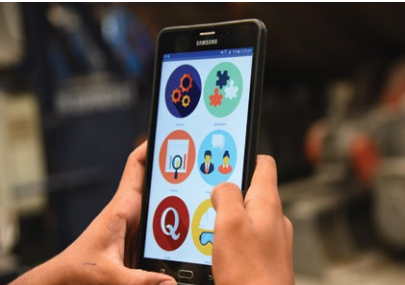
WELDING PROCESSES	MATERIALS WELDED	SPECIALISED WELDING TECHNIQUES
• SMAW • SAW (Semi-Auto/Machine) - NG SAW - Tandem/Twin-Head SAW - LSO SAW • GTAW (Manual/Semi-Auto/Machine) - Hot Wire GTAW - Activated TIG - Keyhole TIG - Automatic Tube # Tubesheet - Inner Bore welding - Orbital TIG • GMAW (Semi-Auto/ Machine) - Pulse GMAW - CMT - Robotic welding • FCAW (Semi-Auto/Machine) - Self-Shielded/Gas Shielded • ESW - Conventional/High speed cladding • PAW • Laser Beam Welding • Arc Stud Welding	• Carbon steel • Low alloy steel (C-Mn, Mn-Mo-Ni, 3.5 Ni, Cr-Mo, CrMoV) • Quenched & Tempered Steel • Stainless Steel • Austenitic stainless steel • Super austenitic stainless steel • Duplex stainless steel, Super & Hyper duplex stainless steel • Ferritic stainless steel • Maraging Steel • Nickel based alloys (Inconel, Incolloy, Monel, Hastelloy) • Copper based alloys (Cupronickel, Aluminum Bronze, Brass) • Titanium & titanium alloys	• Tandem / Twin SAW • Semi-Automatic GTAW/SAW • Robotic • Hot Wire GTAW • Activated - TIG • Narrow/ Ultra-Narrow Gap SAW / GTAW • Pulsed GTAW / GMAW • Internal BoreTube to Tubesheet • Cold Metal Transfer (CMT) • Self - Shielded FCAW • Strip Cladding • High Speed ESW

Continuous improvement in Welding Technology has enabled the development of over 8000 welding procedures qualified as per international codes and standards - ASME, BS, EN/BS, AS/NZ - for a variety of materials in a range of thickness (0.5 to 800 mm) covering the complete spectrum of welding processes. Specialised fabrication facilities include 100,000 class of dust-free enclosures with areas of 1000 sq. m. and 400 sq.m.

DELIVERING ENHANCED VALUE THROUGH DIGITALISATION!



L&T Heavy Engineering embraces digital solutions to enhance its operational excellence and offer your business value-added benefits



WE CONSTANTLY STRIVE TO INCREASE VALUE FOR YOU THROUGH:



On-Time Delivery



First Time Right



Significant Productivity Improvement

OUR DIGITALISATION INITIATIVES INCLUDE:



Smart Machines

- Smart Stations
- Asset Tracking & Utilization
- Remote Monitoring by Smart AR Glasses



Smart Processes

- Advanced Metrology & NDT
- Integrated Engineering Manufacturing Quality System
- Live Project Tracking



Data Analytics

- Real-Time Monitoring of Machines
- Smart Procurement
- Online Dashboards

L&T SPECIAL STEELS & HEAVY FORGINGS

Scrap To Finished Forging With World Class Capabilities & Processes



ELECTRIC ARC FURNACE
(85-120 MT)



VACUUM INGOT CASTING
(Upto 300 MT, H₂ <1 ppm)



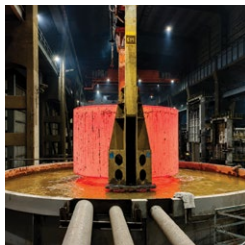
HYDRAULIC PRESS
(9000 MT)



RAIL BOUND MANIPULATOR
(85-120 MT)



REHEATING & HEAT TREATMENT FURNACE
(Upto 400 MT)



QUENCHING TANKS
Upto 0.8 Million litres



VERTICAL SHAFT FURNACE
Shafts Upto: Ø 2000 mm
Height: 16 meters



VERTICAL TURNING LATHE
Weight Capacity: Upto 250 MT
Max Height: Upto 5400 mm



DEEP HOLE DRILLING
Weight Capacity: Upto 100 MT
Max. Drilling Depth: 15000 mm



NABL CERTIFIED LAB

65+ Steel Grades Developed

								TRAMP ELEMENTS - S: 0.0002 wt% Max. - P: 0.003 wt% Max	HARMFUL GASES - H: < 1 ppm - O: < 15 ppm - N: < 50 ppm
Defence Different Grades	Nuclear C-Mn with Ni, Mo & Austenitic SS	Hydropower C-Mn, Ni-Cr-Mo Martensitic SS	Thermal Power Ni-Cr-Mo	Cement Cr-Mo, Ni-Cr-Mo	Oil & Gas Cr-Mo, Ni-Cr-Mo Martensitic SS	Process Plant C-Mn Cr-Mo, Cr-Mo-V	Steel Various Grades	INGOT TYPES - CONVENTIONAL - HOLLOW - VIC	INGOT WEIGHT 6 MT to 213 MT

Forging Shapes & Sizes

SHELLS	BLOCKS	TUBESHEETS	SHAFTS	PLATES	DISHED ENDS
5200 mm Outer diameter	6000 mm Maximum Length	5000 mm Outer diameter	2300 mm Outer diameter	900 mm Maximum Thickness	3320 mm Outer diameter
750 mm Maximum Thickness	2500 mm Maximum Width	755 mm Maximum Thickness	8000 mm Maximum Length	8500 mm Maximum Length	120 mm Maximum Thickness
5250 mm Maximum Length	1150 mm Maximum Thickness	51 MT Maximum Finished Weight	45 MT Maximum Finished Weight	2900 mm Maximum Width	15 MT Maximum Finished Weight
75 MT Maximum Finished Weight	45 MT Maximum Finished Weight			65 MT Maximum Finished Weight	

Dimensions given are mutually exclusive

HOT INDUCTION BENDS, PRE-FABRICATED PIPING SPOOLS, PIPING SKID, TRANSFER LINE

OD: 4" to 56"
Thk: Upto 120 mm
Radius: 1.5 D to 7 D
(Upto 10.2 m)

Dedicated facility for Exotic Material & Internals



Cask & canisters



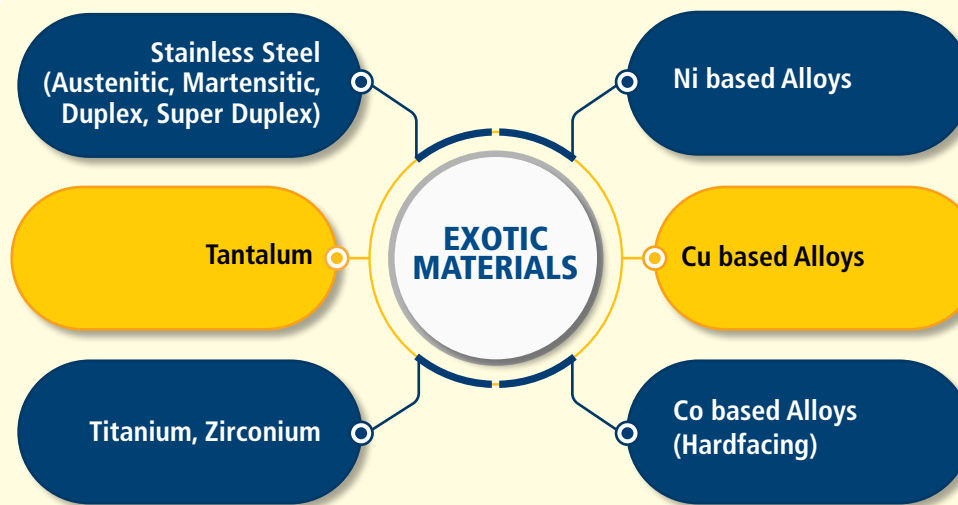
Steam Separator for PHWR
Steam Generator



Grid Assembly for Steam Generators



Cask and Canister





Benchmark delivery of the 700 MWe PHWR Steam Generator in 33 months



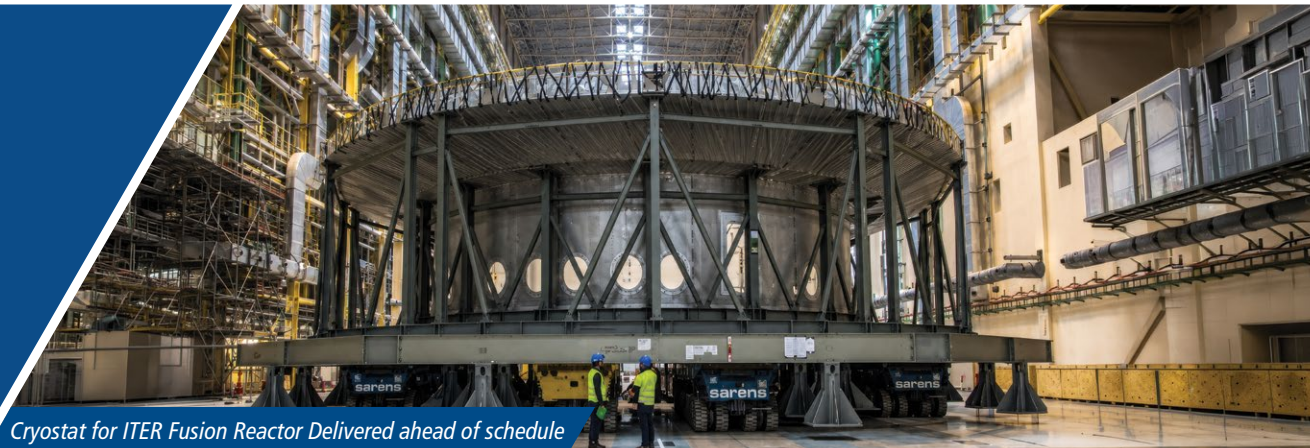
LP & HP Heaters for 700 MWe PHWR

TIMELY DELIVERIES:

TRAFFIC & LOGISTICS

Specialists provide traffic and logistics services for domestic and international customers. All arrangements are made for safe, low-cost and timely deliveries.

Traffic and logistics regularly carry out comprehensive route surveys from point of origin to the final destination; plan and arrange the appropriate mode of transport; obtain statutory clearances and organise inter-agency co-ordination as per the specific needs of customers.



Cryostat for ITER Fusion Reactor Delivered ahead of schedule



End Shield maneuvering fixture



RO-RO Jetty
90 m X 40 m

Main Jetty
200 m X 18 m

L-Shaped Jetty
80 m X 40 m

Captive Jetty at A M Naik Heavy Engineering Complex



End-Shield for 700 MWe delivered 6 months ahead of schedule

GREEN INITIATIVES

At L&T, we believe that a holistic approach and responsible informed choices can lead to sustainable solutions. Our programmes are aligned to help combat climate change, drive energy efficiency, and encourage renewable energy usage.

Green initiatives at A M Naik Heavy Engineering Complex:

- Green Hydrogen Plant for captive usage
- Ecosystem restoration by converting Lawn area to Urban Forest
- Water efficiency and conservation measures



- Green product usage – Eco-friendly Construction Material
- Rainwater harvesting & Groundwater Recharge System
- CII-Certified Single-Use Plastic (SuP) Free Complex

We foster a culture of responsibility through periodic awareness and trainings for our workforce and thereby embed environmental stewardship within our business.

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Larsen & Toubro Limited, Heavy Engineering

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