

Prospects of Indian-Russian Co-operation in Equipment Manufacturing



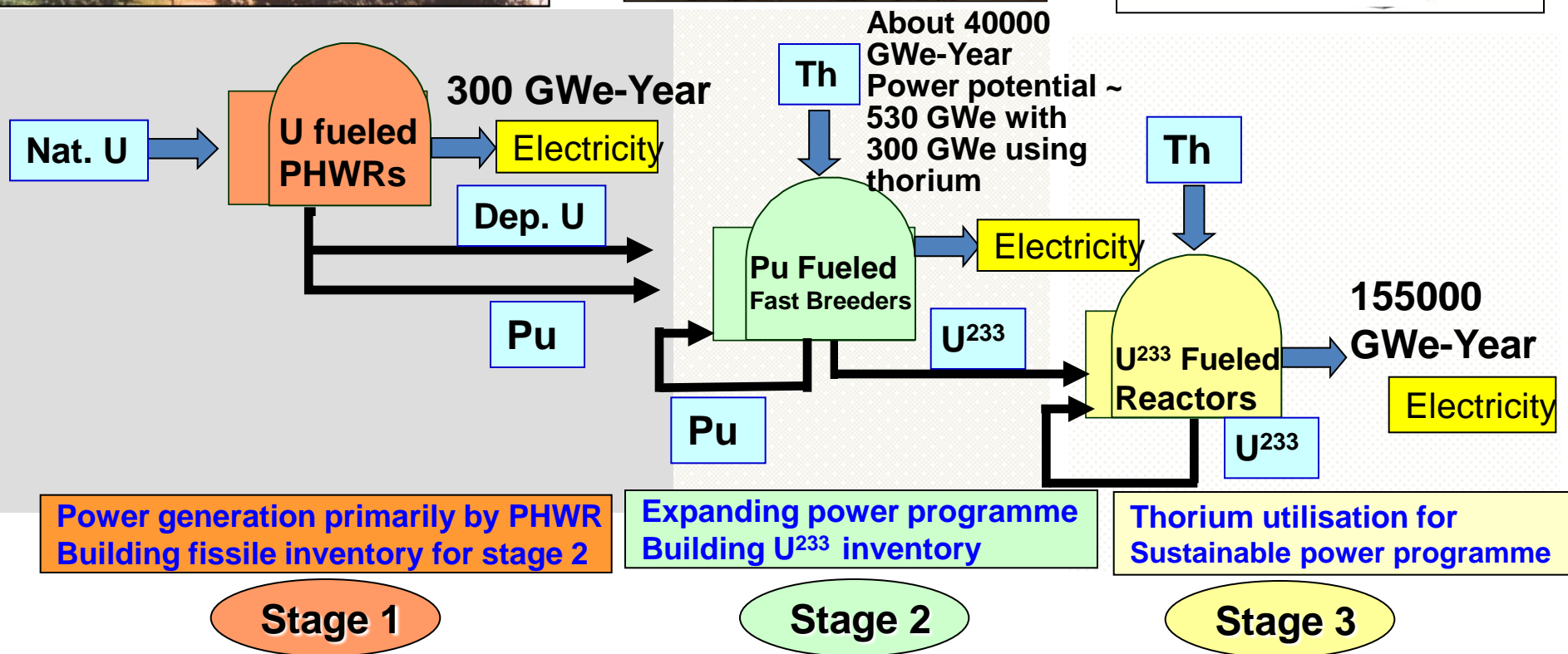
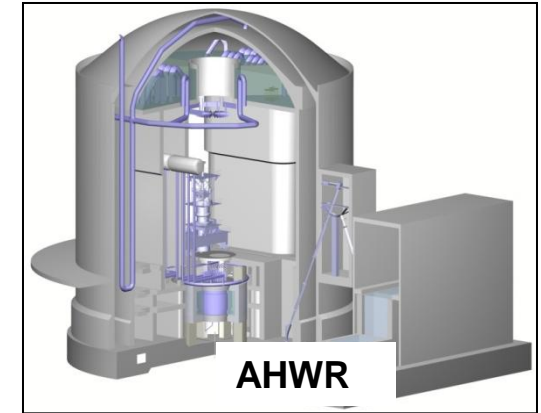
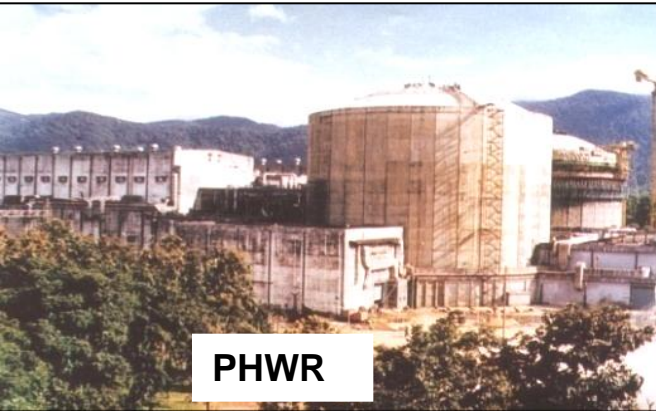
Vice Admiral (Retd) S K K Krishnan
Senior President
Walchandnagar Industries Ltd.
I N D I A

Indian Nuclear Power Program

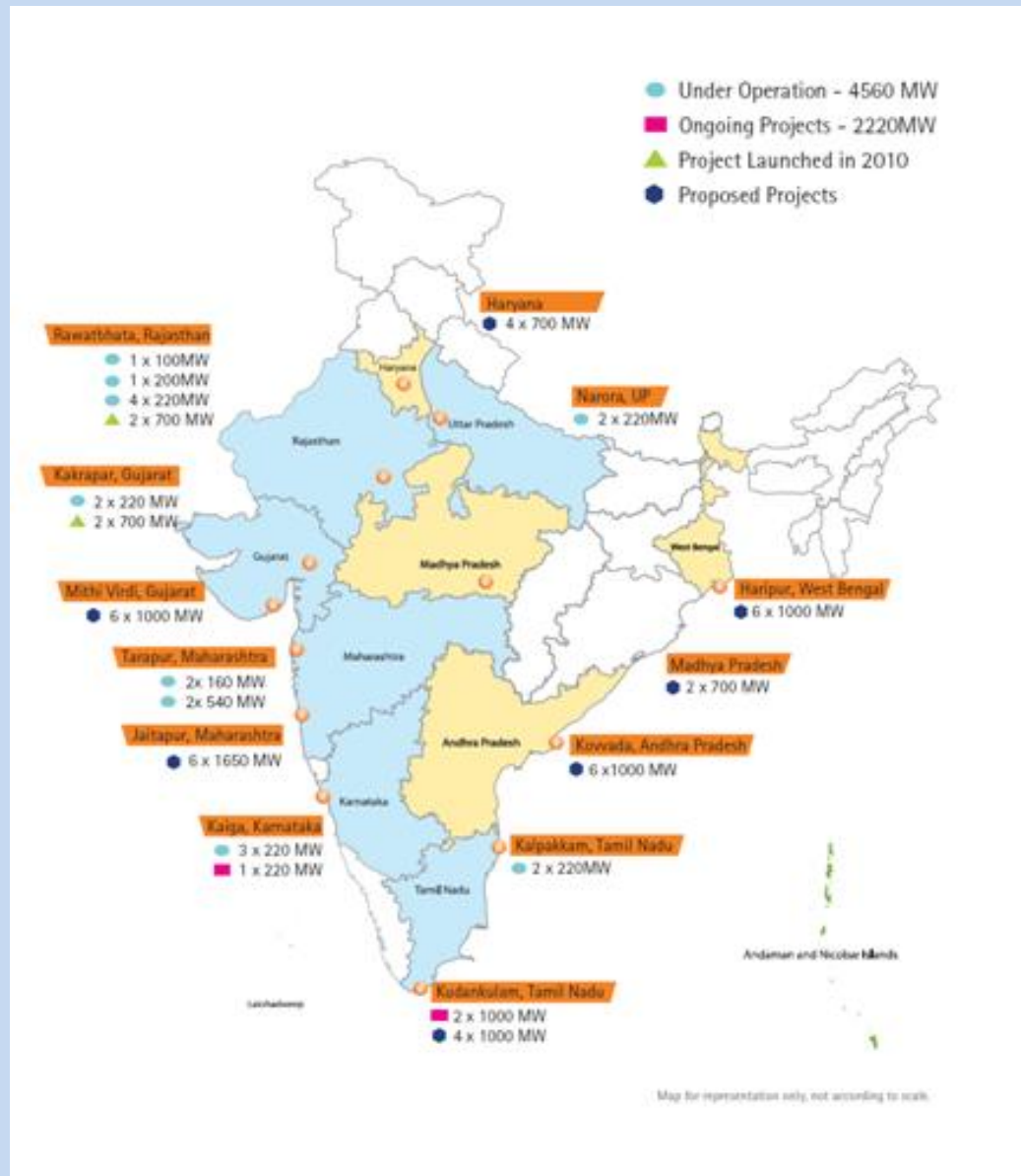


- Nuclear Power in Indian Perspective – Not an Option, But a Necessity.
- Three Stage Indian Nuclear Power Program incorporates closed fuel cycle and Thorium utilization for sustained growth with 25% of world's reserves in India.
- 40 GWe of Nuclear Power with International Co-operation planned to bridge Energy shortfall.
- Civil Nuclear Liability Law in place.

Three Stage Indian Nuclear Power Program



Indian Nuclear Power Program



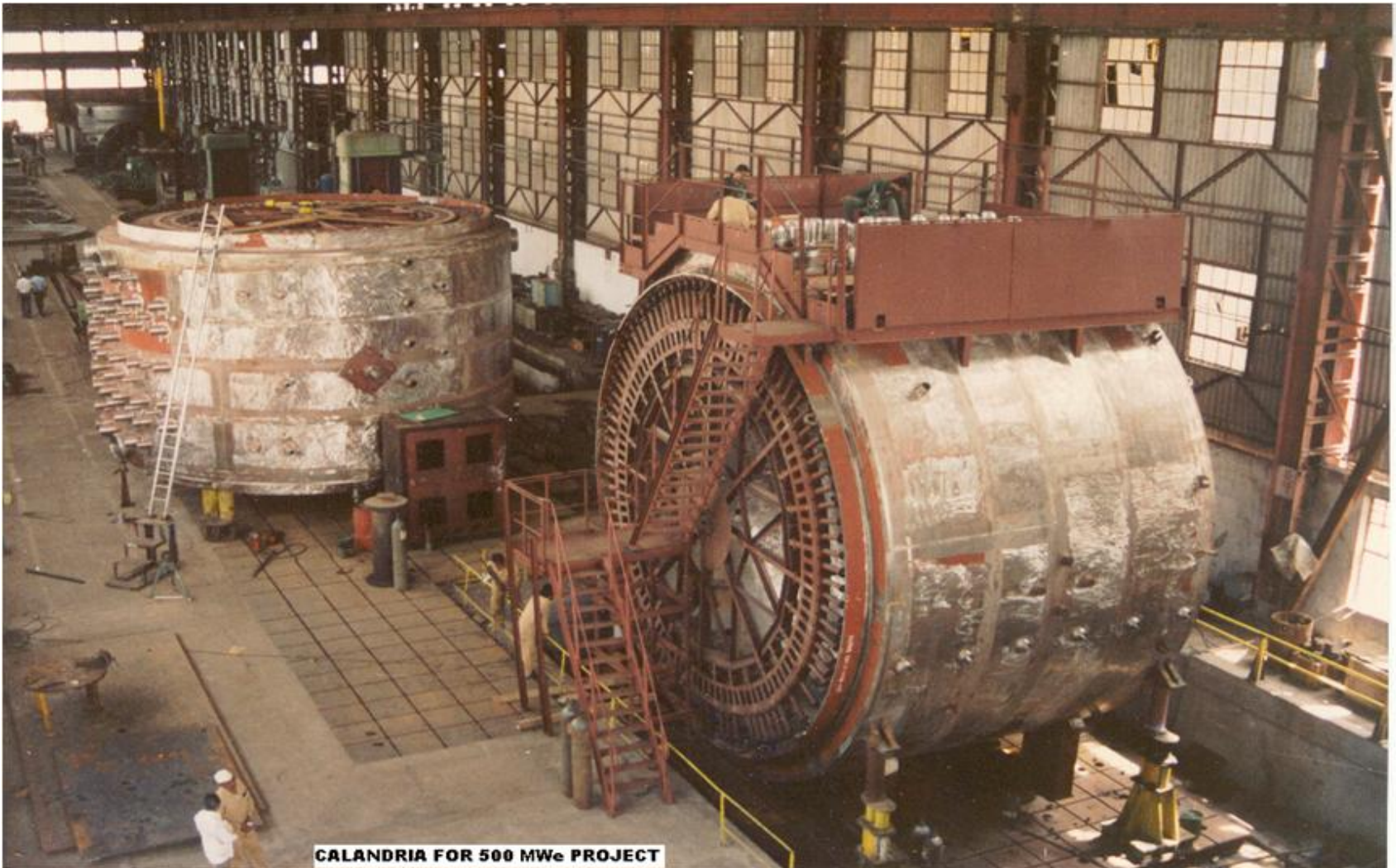
WIL Contributions to Indian Nuclear Program



Stage 1 – PHWR

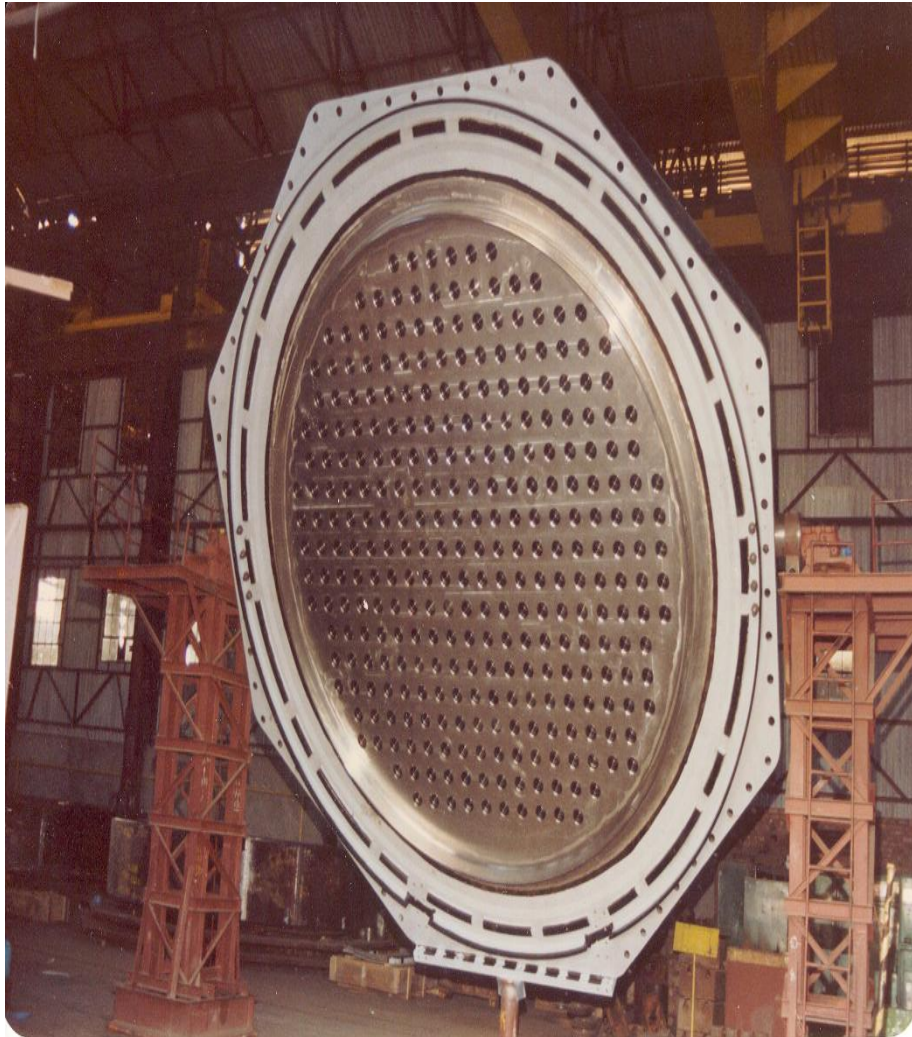
MAJOR COMPONENTS	PROJECT	QUANTITY	STATUS
Calandria	220 MWe	11	Supplied
Calandria	540 MWe	2	Supplied
Calandria	700 MWe	3	Under Manuf.
End Shields	220 MWe	4	Supplied
Moderator Heat Exchangers	220 MWe	4	Supplied
Moderator Heat Exchangers	700 MWe	8	Under Manuf.

Nuclear Fabrication During 1990-2000 Calandrias For 540 MWe Project (TAPP)



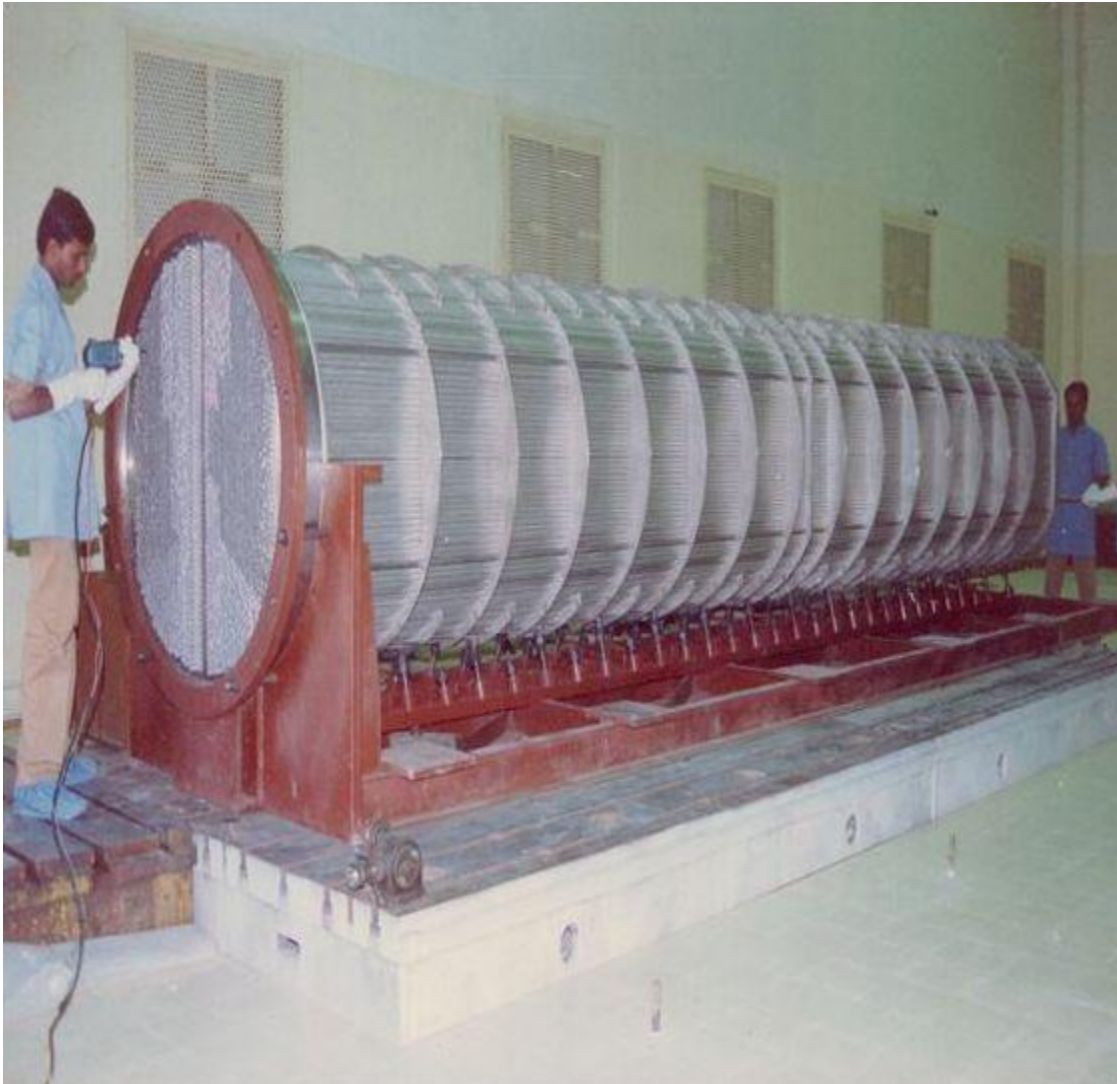
Nuclear Fabrication During 1980 – 1990

End Shield For 220 MWe for Kaiga



WIL successfully established the process for Welding of 306 Nos. of critical Tri-junction joints (Welding of 3 components at a time) for each End Shields of NPCIL. The joints are deep inside the bores and cannot be seen directly by the welder, and the welder has to use mirror and access the joints during the welding. The welding procedure to be qualified on Mock-Ups simulating the job welding. NDT involved Boroscope and Ultrasonic checks.

Moderator Heat Exchanger: 220 MWe Project Kaiga



For fabrication of Heat Exchangers in SS 316L material for NPCIL successfully completed 3300 Nos. of 'U' joints involving 12.76mm O.D x 1 mm thick tubes & 150 mm thick tube-sheet in 2 passes. The quality requirements are very stringent in terms of parameters like mean leak path, zero porosity etc. WIL successfully achieved 100% compliance.

WIL Contributions to Indian Nuclear Program



Stage 2 – FBR Program

MAJOR COMPONENTS	PROJECT	QUANTITY	STATUS
Sodium Pumps	FBTR	5	Supplied
Core Catcher	500 MWe	1	Supplied
Core Support Structure	500 MWe	1	Supplied
Intermediate Heat Exchangers	500 MWe	5	Supplied
Sodium-Air Heat Exchangers	500 MWe	2	Supplied
Decay Heat Removal Exchangers	500 MWe	2	Supplied

Core Catcher For 500 MWe PFBR



Core Support Structure for 500 MWe PFBR



Intermediate Heat Exchanger



INTERMEDIATE
HEAT EXCHANGER
FOR 500 MWe
PFBR

TUBE BUNDLE
ASSEMBLY
(MATL:
SS 316LN)

Introducing **Walchandnagar Industries Ltd.** - A Tribute To The Pioneering Industrialist Whose Life Was Triumph Of Persistence Over Adversity



SETH WALCHAND HIRACHAND
(1882 – 1953)
Founder

**Pioneer in Aircraft Manufacturing
Founder
Hindustan Aircraft Company**

**Pioneer in Maritime Shipping
Founder
Scindia Steam Navigation Company**

**Pioneer for Shipbuilding Industry
Founder
Hindustan Shipyard Vizag**

**Established many new ventures
In various core sectors like
Automobile
Civil Engineering
Construction of
Dams, Bridges, Barrages,
&Tunnels
Hume Pipes**

**&
WALCHANDNAGAR
INDUSTRIES LTD
(W.I.L)**

**WIL is a diversified High-tech Heavy Engineering Project Execution company
with a strong Engineering , Manufacturing & Project Management capabilities
With significant presence in the diverse core sectors like:
Steam Generation & Power Projects, Nuclear Power Projects and Space Programmes
Cement Projects, Mineral Processing Projects , Industrial & Marine Gearboxes, Sugar Projects**

Core Businesses

Projects

Steam and Power Generation, Cement, Mineral Processing and Sugar Plants

Products

Heavy duty Gearboxes, Material Handling and Process Equipment, Castings and Precision Instruments

Manufacturing

Customer Designed Equipment of National Importance for Nuclear Power, Aerospace and Defense

- **Area Under Crane : 56, 000 Sq. Mtr.**
- **Overhead Cranes Lifting Capacity : 170 Tonnes**
- **Highly skilled and motivated Human Resources capable of working in challenging environment.**
 - Total Manpower : 1866**
 - Managerial and Supervisory : 538**
 - Highly Skilled and experienced Workmen : 1328**
- **Fully equipped with all modern manufacturing facilities such as CNC Horizontal and Vertical Boring Machines with multi-axis control, Lathes, Milling Machines, Gear Cutting and Grinding Machines etc.**

- **Sophisticated Automatic Welding Systems capable of precision welding of exotic materials.**
- **“Clean Halls” conforming to Federal Standards for critical assembly and precision welding related to Nuclear, Aerospace and Defence equipment.**
- **Large sized Furnaces with Data Acquisition Systems.**
- **Well equipped Test Beds for proving the performance of the Gear Boxes.**
- **Optical tooling and measuring instruments for precision measurements**
- **Sophisticated NDT facilities for Ultra-Sonic Testing, Radiography, Leak Testing and Pressure Testing with multi channel strain measurements.**

Complying with various Codes



- **Fabrication of critical equipment complying to various codes of conformance such as ASME Sec. II , Sec. III NB, NC, ND, NF & Sec. VIII Div.1; IBR. Act 1948; ISO; DIN; GOST & Customer Codes etc.**
- **Welding procedures and welders qualified under the various third party inspection surveillances such as IBR., NPCIL, VSSC, EIL, LRIS, ABS, PDIL, Bax Council, TCE, BV, DNV, DRDL, Holtec etc.**

Critical Materials Handled

- **Cladded Steel (Stainless Steel, Titanium Cladding)**
- **Alloy Steel (Including varieties of Cr, Mo Steels)**
- **Stainless Steel (Austenitic, Martensitic & Super Duplex Types)**
- **High Strength Maraging Steel & Vanadium Steel**
- **Monel**
- **Inconel & Incoloy**
- **Titanium Alloy**
- **Aluminum Alloy**
- **Cobalt Alloy**

- **SMAW, GTAW, GMA : In all positions**
- **Dissimilar Metal Welding**
- **SS Strip Cladding**
- **Automatic GTAW - for high strength materials like Maraging steels, Aluminum and Titanium alloys.**
- **Twin-wire Submerged Arc Welding (SAW) for high productivity.**
- **Narrow Gap SAW**
- **Welding involving grid type construction, with 'K' TYPE configuration meeting stringent NDT requirements with zero defect.**
- **CNC Plasma / Flame Cutting.**



PLANT AT WALCHANDNAGAR

Nuclear Fabrication Shop



Large Size VBM for Nuclear Components



WIL 7/10/08

Series of Horizontal Boring Machines



WIL 16/6/07

Heavy Duty Plano Miller and Facing Lathe



Light Machine Shop

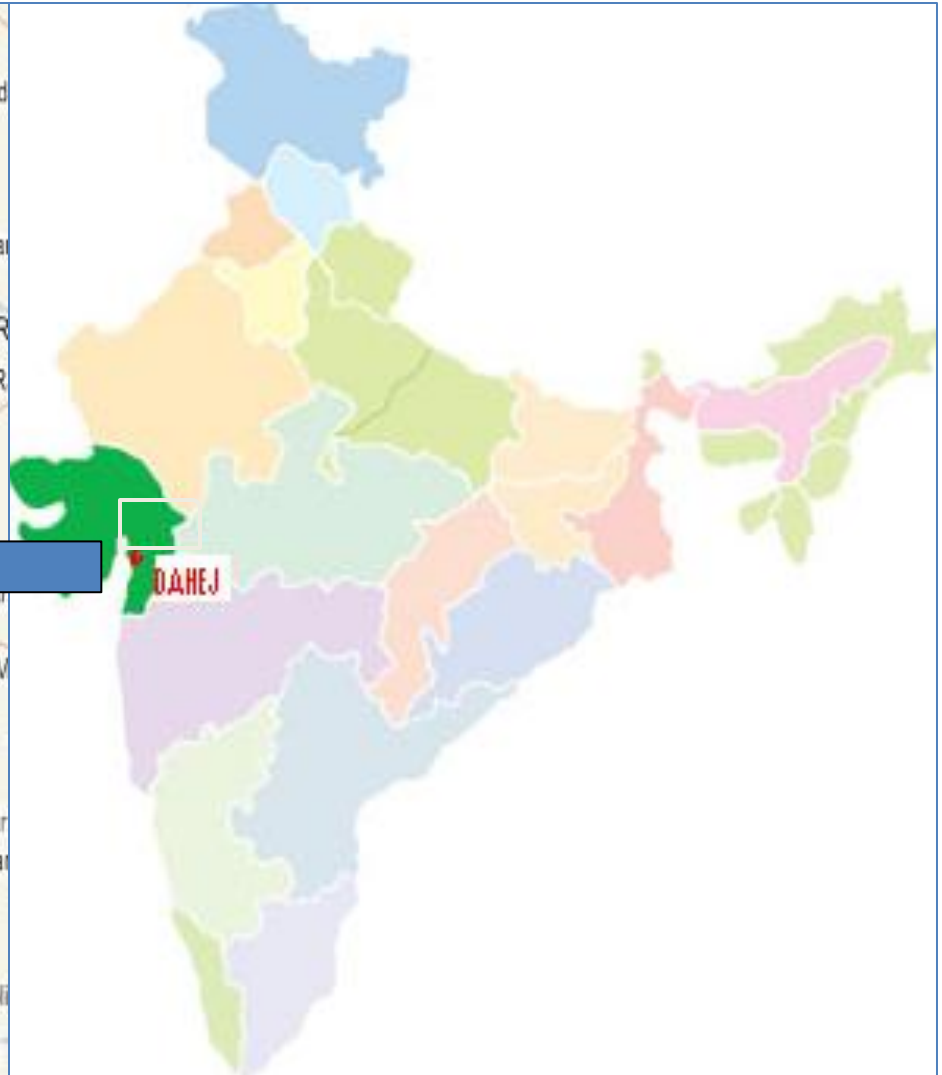


WIL 25/11/07

Heavy Duty Bending Machine (Cold Bending Upto 120 MM)



Dahej Location



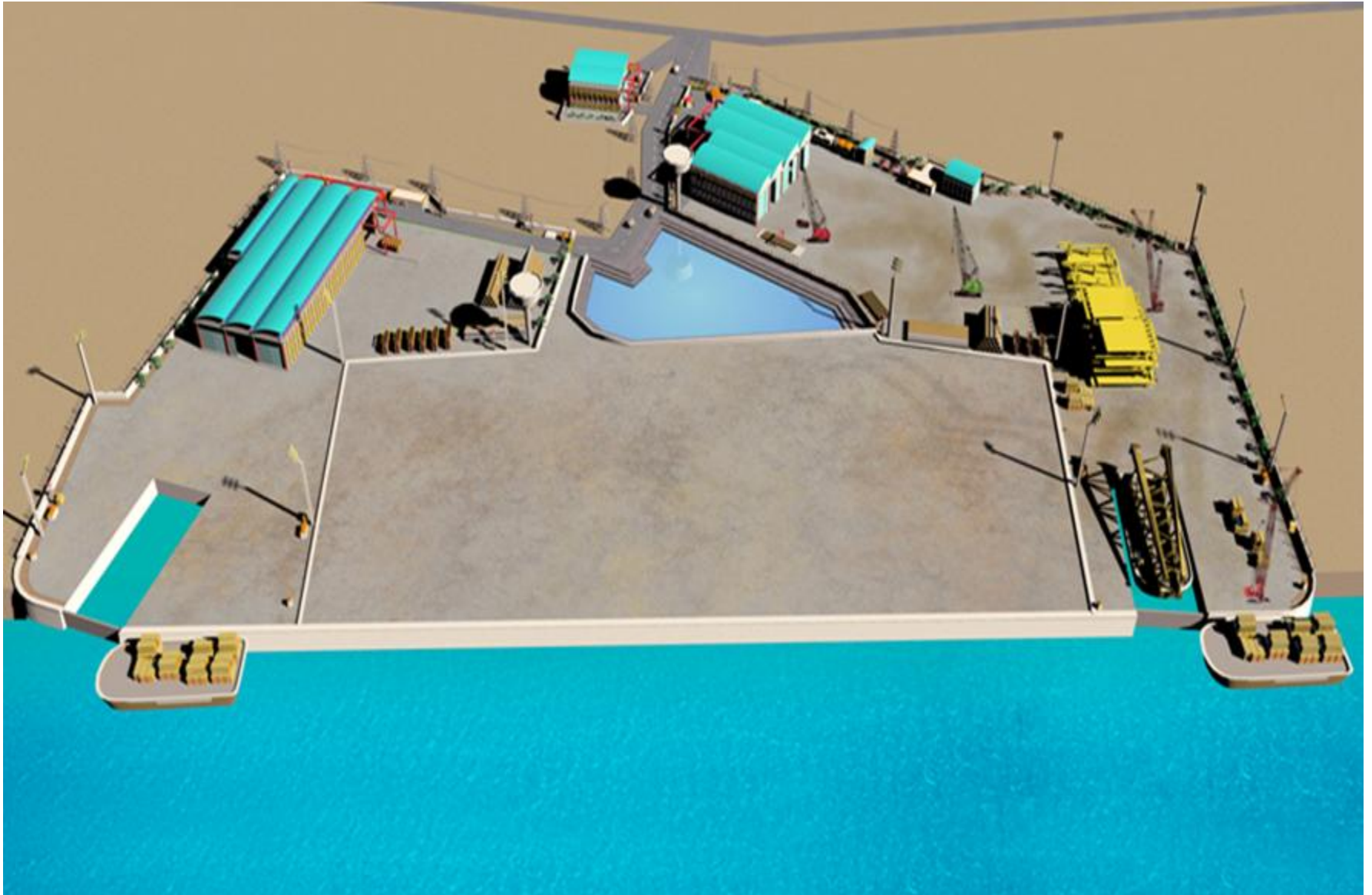
Location Photo



Dahej Layout



Dahej Layout



THANK YOU

