

GEECO



RAPH | ESP | FES | CFD | FEA | TESTING

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ABOUT US



GEECO Enercon Pvt. Limited, a successful engineering organization had its inception in the year 1985 by venturing into Rotary Air Preheater (APH) spares manufacturing. After proving our uniqueness and stand-alone capability in Air Preheaters and putting forth energy conservation, we enhanced our notion towards environmental conservation with Electrostatic Precipitator System (ESP) solutions. GEECO's various functional areas include 'Design, Engineering, Research & Development, Manufacturing, Supply, Erection, Commissioning & Service Supervision'. Our Company operations are efficiently managed by established ERP systems.

Administration, Design, Procurement, Commercial & Marketing operations are carried out in our head office located at Tiruchirapalli, India while other activities which include Production, Quality, Stores and Shipping are executed at our expansive factory with total covered area of 154,000 sq.ft. situated in 20 acre land facility near Thanjavur, India.

With our global exposure & technical expertise, the consequences of global warming and pollution are being reduced through our APH and ESP using customized designs based on our customer requirements.



VISION

- To be a world class engineering organization that provides best products & services

MISSION

We commit to be the most admired company by

- Providing the products and services that exceed customer expectations
- Innovating & Deploying total business solutions
- Empowering our employees & creating an environment for them to perform at their highest potential

MANAGEMENT TEAM



Mr. V. Rajagopal
Managing Director

A Post Graduate in Mechanical Engineering with vast experience in Air Preheater since starting with BHEL in 1975. He was first trained at Combustion Engineering, USA and later headed Air Preheater division at Alstom. He has worked with most of the Air Preheater designs available around the globe and is actively involved in its selection, design and field engineering. A multifaceted personality who develops strategical plans towards company growth.



Mr. C. Gunasekaran
Director

A versatile entrepreneur who holds a Manufacturing Industry for Boiler components since 1982 with “Indian Boiler Regulation” certification and has huge experience in manufacturing components for Cement & Steel Plants. He guides the Financial activities of GEECO and is instrumental in making sound investment decisions. He monitors financial outcome against the Company's plans and budgets.



Mr. V. R. Vijayaprakash
Technology Management Advisor

A Mechanical Engineering graduate with dual Masters from Germany, one in Management & other in Computational Engineering. He has handled various customers around the globe during his tenure with Bombardier & CD-adapco. Has been a tremendous contributor to GEECO's success by actively involving in Management, R&D, Engineering & IT. He is also leading TEFUGEN Technologies Pvt. Ltd., which offers CFD / FEA / IT solutions.

ROTARY AIR PREHEATER

STRENGTH & CAPABILITIES

- Supply of Quality Spares for any make and size of Air Preheater up to 1000 MW
- Supply of New Air Preheaters
- Carry out CFD / FE Analysis
- In-house Research & Development (R&D)
- Undertake Assessment Studies
- Undertake Renovation and Modernization Jobs
- Field Engineering Services
- Conduct Air Preheater Performance Test

SPARES SUPPLIED BY GEECO

- Rotor Assembly, Heating Elements, Baskets, Enamelled Baskets, Seals, Bearing Housing, Connecting Plate
- Sector Plate, Support Bearing, Guide Bearing, Rotor Drive, Oil Circulation System
- Cleaning Device, Wash Pipe & Deluge Assembly, Fire Sensing Device, Rotor Stoppage Alarm





ENGINEERING CAPABILITIES

- Complete In-house design
- Validated software program to select appropriate design for Air Preheater
- Computerized performance prediction
- Analysis & Optimization of flow with the help of Computational Fluid Dynamics
- Structural Design & Optimization by Finite Element Analysis

MANUFACTURING CAPABILITIES

- Manufacturing Capacity of 1600 MT per month
- Concurrently, 4 numbers of bigger size APH 36 VI can be manufactured
- Equipped with all machineries required for our In-house activities



ROTARY AIR PREHEATER



NEW AIR PREHEATER

Executed a contract to M/s DMCI Calaca Unit #1, 300MW Power plant situated in Phillipines by replacing the existing Air Preheater of Size 2x29 VIMT 88(100) with new APH of Size 2x29.5 VIT 88 QMR with latest state of art Design, Engineering, Upgraded heating element Profile GCF and Automatic sealing system GLRS®, Manufacturing, Supply and Site supervision to the Customer's entire satisfaction.

GAS TO GAS HEATER

We have executed a "Major Order" from the leading power producer, TATA Power - India, for replacement of existing Gas to Gas Heater to New Gas to Gas Heater [Size 27 VIM 84"] including Design, Engineering, Manufacturing, Supply & Site Supervision for their 500 MW Trombay unit.



RENOVATION & MODERNIZATION-ADVANTAGES

- Increased Heat Transfer Area
- Reduced Leakage
- Reduced Differential Pressure across the APH
- Assured Highest possible Efficiency
- Reduced Fuel Quantity
- Reduced Fan Current
- Increased Revenue

MAJOR SUCCESSFUL PROJECTS

<p>Hindalco Industries Ltd., Renusagar-India</p> <p>Executed the contract for 5 Boilers involving Design, Engineering, Manufacturing, Supply & Site Supervision for Air Preheater.</p>	<p>Tuticorin Thermal Power Station, (TANGEDCO), India</p> <p>Four contracts for Unit 2, Unit 3, Unit 4 & Unit 5, Converting existing Air Preheater to Modular Air Preheater with Double Sealing Arrangement</p>	<p>Mettur Thermal Power Station, (TANGEDCO), India</p> <p>The existing Air Preheater were replaced with higher size Air Preheaters with Double Sealing</p>
<p>Indian Farmers Fertiliser Cooperative Ltd., (IFFCO), Phulpur-India</p> <p>Replacement of 21.5 VIR APH to higher size 22 VIR with double sealing. Guide vanes were introduced through CFD analysis to optimise flow distribution.</p>	<p>National Aluminium Co. Ltd., Damanjodi-India</p> <p>Replacement of existing APH with higher size APH to increase the heat transfer area.</p>	<p>Quezon Power, Philippines</p> <p>Modifications done to Improve Air Preheater Performance.</p>
<p>SEM-Calaca Power Corporation, Philippines</p> <p>Replacement of 29 VITM 88(100) APH to 29.5 VIT QMR 80(88) with triple sealing. Guide vanes were introduced through CFD analysis to optimise flow distribution.</p>	<p>Kapar Energy Ventures, Malaysia</p> <p>Modifications done to Improve reliability of Air Preheater operation.</p>	<p>TNB Janamanjung, Malaysia</p> <p>Replacement of guide bearing assembly and modifications to improve APH performance.</p>

ELECTROSTATIC PRECIPITATOR



SUPPLY AND SERVICE CAPABILITIES

- Supply, Erection & Commissioning of ESP for any capacity of plant
- Retrofitting, Renovation & Modernization
- Maintenance and repair works
- Inspection and assessment
- Expert consultancy services
- All electrical related services

ENGINEERING CAPABILITIES

- Sizing and selection for any type of applications and for a wide variety of fuels including fossil and biomass
- Design and engineering for both Tumbling Hammer Rapping Mechanism and Electro Magnetic Impulse Gravity Impact (EMIGI) Rapping design
- Compliance with stringent emission norms as low as 20 mg/Nm^3
- Structural frame analysis using FEA
- Model study using CFD tool



ESP SPARES



Rapping Shaft, Inner Arm, Outer Arm, Set Ring, Coupling, Clutch, Geared Motor, Grip Coupling, Drive Shaft, Vertical Shaft, Pin Wheels - Big & Small, Firm & Loose Type Shock Bar, Shock Pad, Shock Bar Guide-Front & Rear, Rapping Timer System



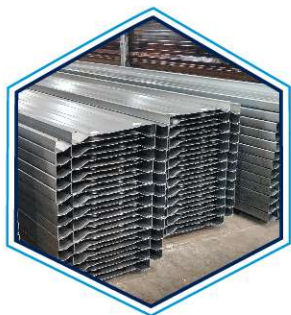
Plain Bearing, Roller Bearing, Free & Fixed Bearing, Bush Bearing, Thrust Bearing & Pad



Rapper Coil for EMIGI, Plunger, Hyplan Boot with SS Clamp, Purge Air System, Heater for Hopper, Shaft Insulator & Support Insulator, Thermostat, TR Set with Panel & Accessories, Mechanical Safety Interlock, Ash Level Indicators



Inlet GD Screen, Deflection & Throttle Plate, Outlet Screen, Screen Tubes, Hopper Deflection Plate, Baffles



All Type of Discharge/Emitting Electrode and all Collecting Electrode Profiles, Suspension Rod, Stretching Tool for Emitting Electrode, 'U' Guide



Conical & Cylindrical Support Insulator, Shaft, Pin & Bushing Insulator, Post Insulator

GEECO Supplies Spares For Any ESP Make And Type

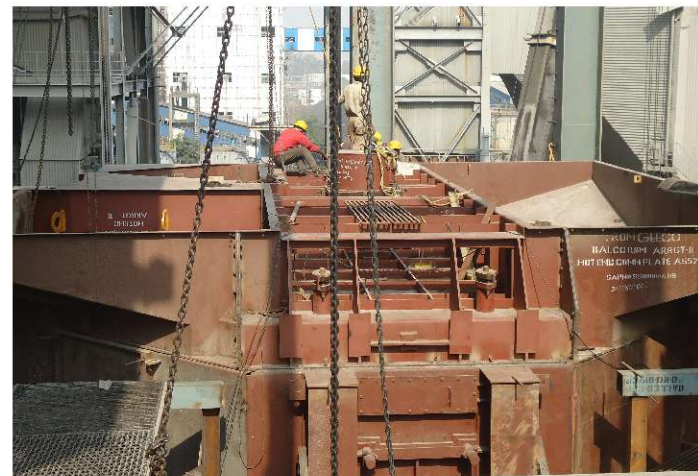
FIELD ENGINEERING SERVICE

CAPABILITIES

- Dedicated & Technically competent Engineers
- Quick Troubleshooting
- Imparting knowledge to the Customers
- Fast Response & Customized solutions
- Identify even the smallest problem that may lead to performance loss
- Suggest performance improvements
- Maintain long-term customer relationship
- Increase the reliability of operation

SUPPLY / SERVICES RENDERED

- Smallest size 15 HSX (Dia. 2600mm) to Biggest Size 35 VI (Dia. 16400mm)
- Horizontal Type
- Vertical Type
- Rothemuhle Type
- From 30 MW to 1000 MW



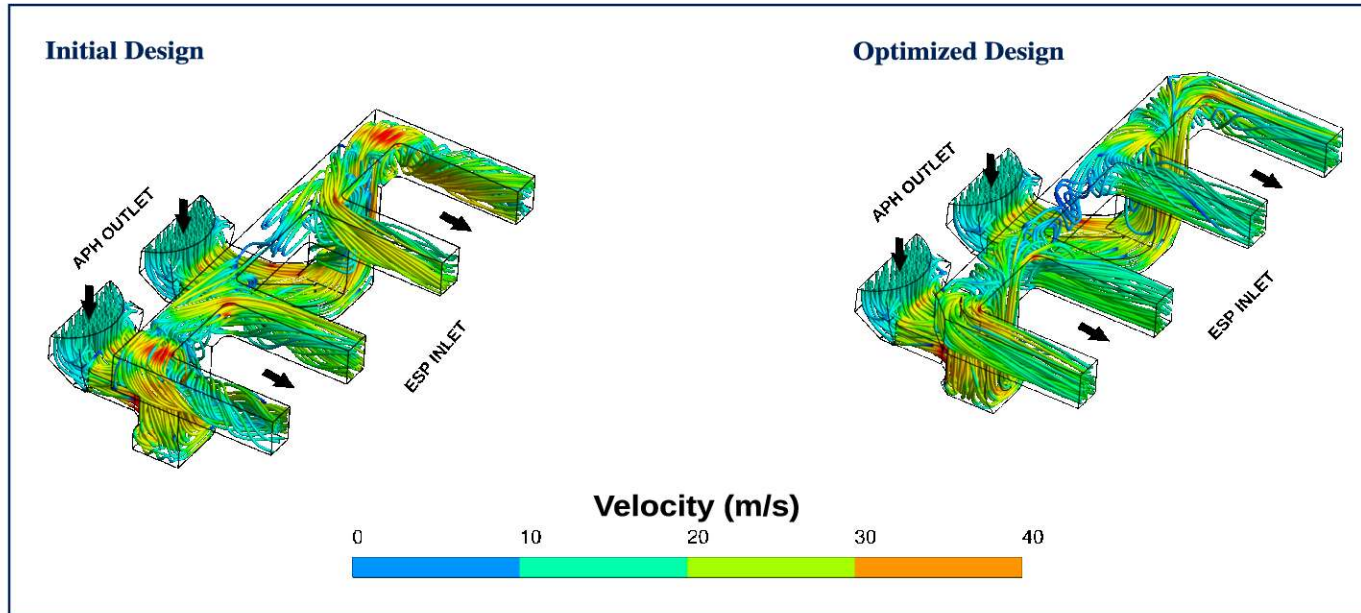


EXPERT SITE SERVICE FOR APH & ESP

- Field Engineering consultancy services
- Assessment Studies
- Preventive maintenance & maintenance advice
- Support during annual overhauling & unplanned shutdowns
- Performance Improvement
- Replacement & repair recommendations during overhaul
- Recommendations & execution of R&M
- Troubleshooting

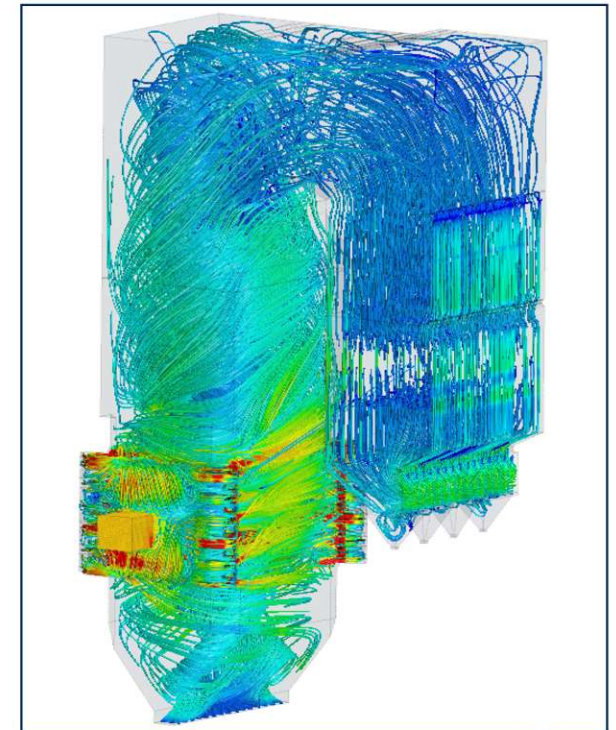
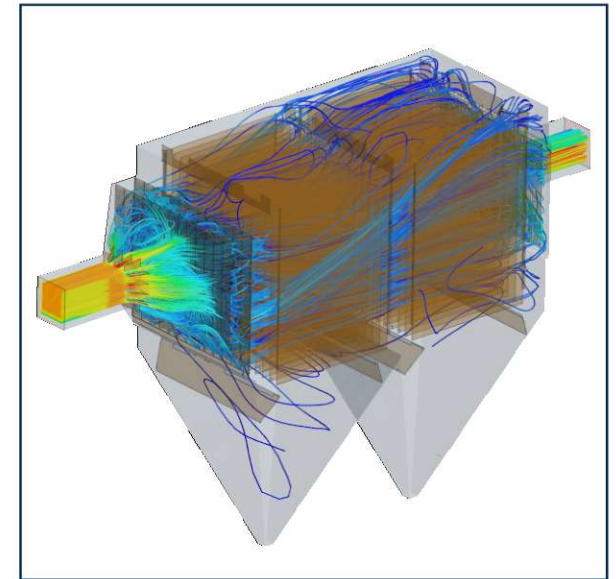


COMPUTATIONAL FLUID DYNAMICS

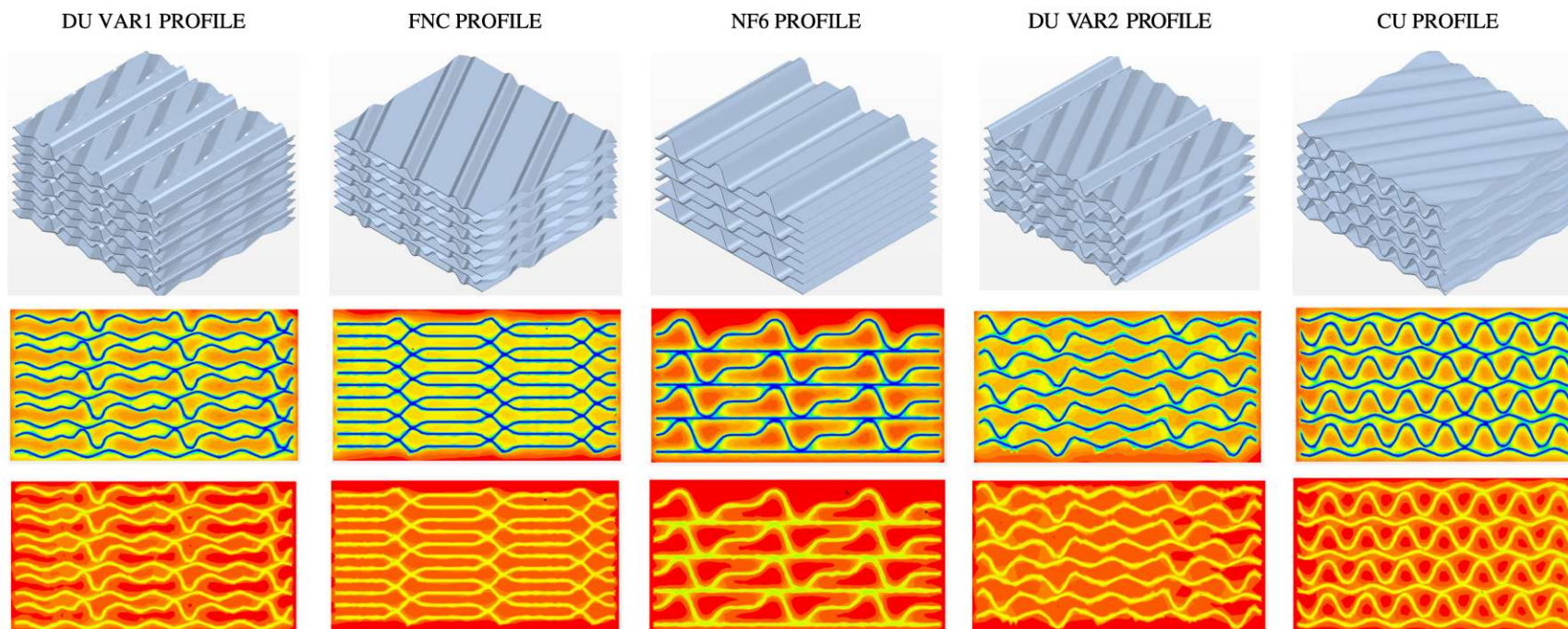


With the remarkable progress achieved in the field of computer technology, Computational Fluid Dynamics (CFD) have been a useful low-cost optimization tool for internal flows through duct / pipe networks. Using CFD models, pressure, velocity & temperature fields are visualized through the existing component for a particular operating point. Due to sudden geometry variation like sharp bends & abrupt expansion / contraction in the existing geometry, problematic areas such as flow recirculation & non-uniform velocity zones that contribute to the excessive pressure drop are identified. Multiple optimization cycles are carried out in order to arrive at a final optimized design, which has the minimum possible pressure drop for the duct system & uniform velocity distribution. The Boundary Conditions are arrived by manually testing the flow onsite.

The Streamlines depict the flow inside the Flue gas ducts, vividly showcasing even flow distribution in the optimized design as compared to initial design. CFD analysis is also carried out in Electrostatic Precipitator and boiler first & second pass.



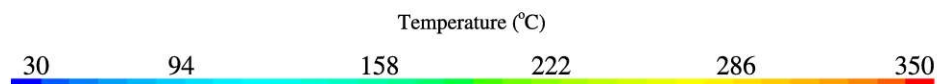
Transient Analysis of various Air Preheater Heating Element profiles was carried out in a test environment to provide a detailed comparison of Temperature, Pressure, Velocity, Boundary Heat Transfer, Turbulent Kinetic Energy & Nusselt Number. The results are used to select the most appropriate heating element profile for the plant operating condition. CFD Analysis is also carried out to study the flow pattern & establish a uniform flow upstream of the Air Preheater.



Geometries of APH Heating Elements.

Time Step : 0.2 secs
Unsteady Heat Transfer
Study of APH Heating
Elements.
Temperature Plot.

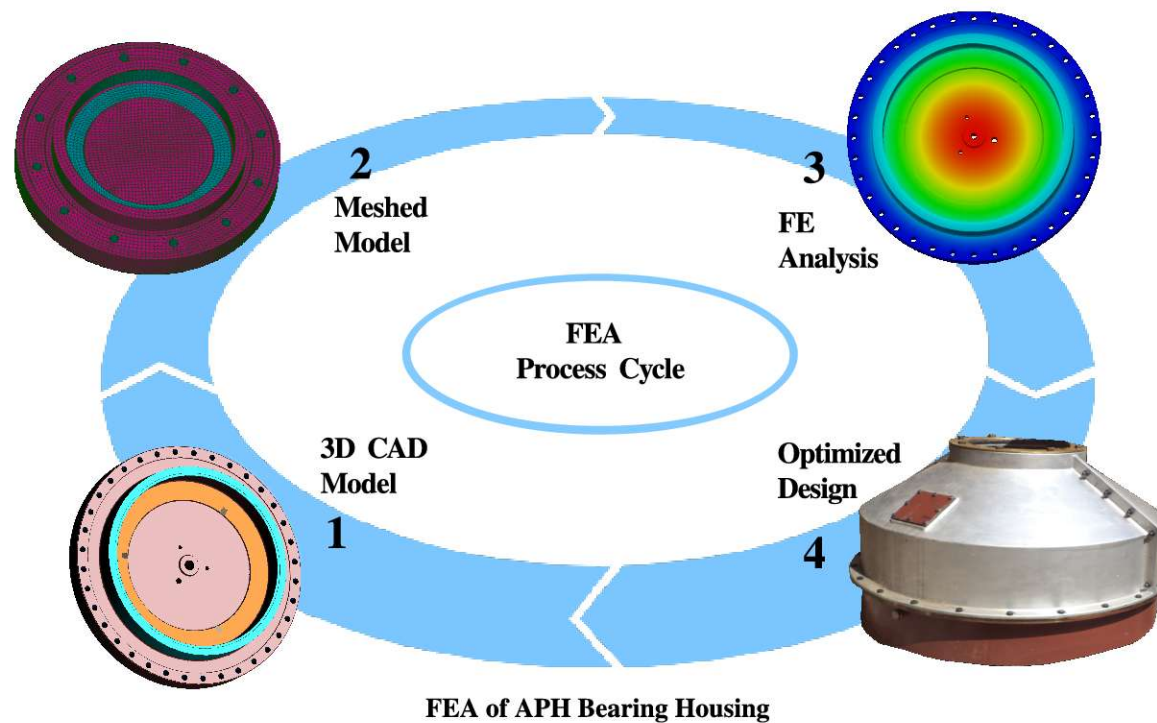
Time Step : 20 secs
Unsteady Heat Transfer
Study of APH Heating
Elements.
Temperature Plot.



FINITE ELEMENT ANALYSIS

In modern engineering design, FEA has evolved as a powerful tool for “Computer Aided Modeling” and analysis of structures having complex geometries & variable material properties. It accurately predicts component's behaviour when subjected to thermal and structural loads.

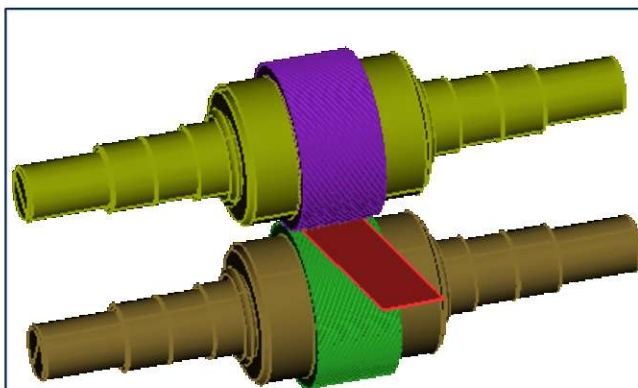
GEECO extensively uses FEA during “Product Design & Development” phase to analyse the induced stress and deformation while the system (APH, ESP, etc.) is in operation, leading to product innovation and better performance.



FEA APPLICATIONS

Manufacturing Optimization

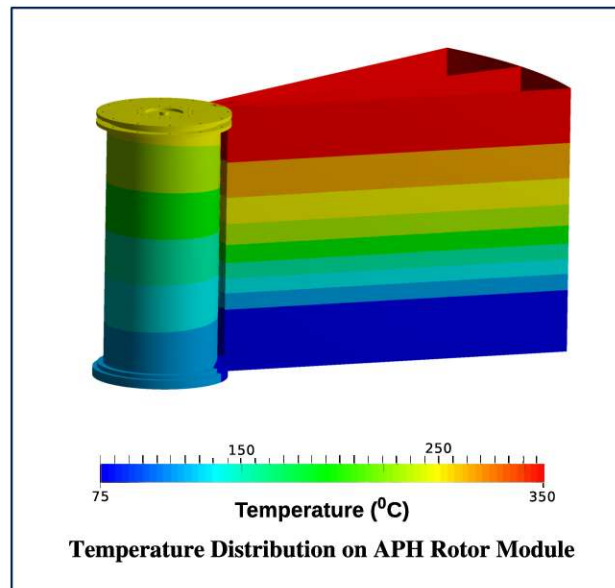
In GEECO, various manufacturing processes are optimized using FEA. For example, “Forming Simulation” of heating elements during “cold rolling process” is done to optimize and maintain the dimensional accuracy of heating element profiles. Similarly FEA is also used for welding sequence and clamping point optimization, tool wear & tear optimization, etc.



Cold Rolling Simulation

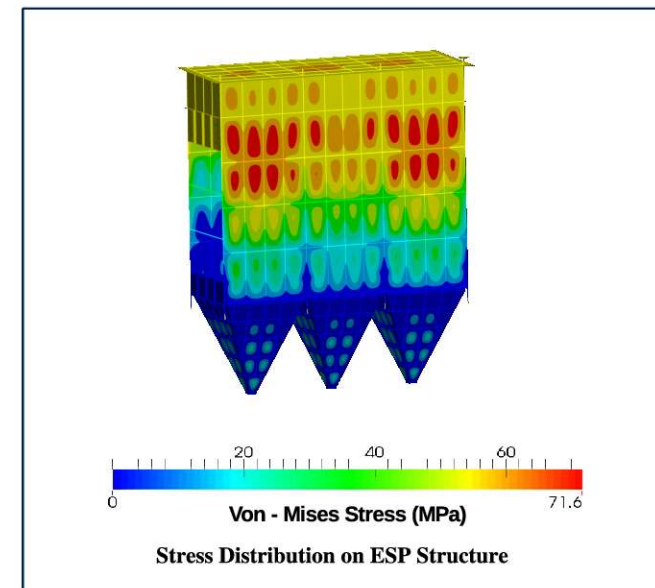
Thermal Optimization

FEA is used for prediction of temperature distribution and distortions, resulting from thermal loads on APH & ESP components. For example, rotor deformation during APH operation is simulated and it is optimised to minimize deflection and increase robustness of the system. Similarly thermal loading are also checked for APH Center Section, Supporting Joints, ESP Insulators, etc.



Structural Optimization

Induced stress and strain due to structural loads acting on APH & ESP system are analysed using FEA. For example, various loads acting on ESP structure such as wind, ash, atmospheric & flue gas pressure, etc., are analysed and its structure is optimized for safe operation & longer life. Structural analysis is also done for various APH and ESP components.



TESTING

GAS DISTRIBUTION (GD) TEST

As the ESP cross section area is huge & the gas velocity is reduced from 15 m/s to less than 1 m/s, GD test is mandatorily done in all ESP's as part of pre-commissioning test to check the uniformity of flue gas flow across the section, so as to achieve effective utilization of the area for collecting dust particles. GD test is carried out using vane type digital anemometer suitable for measuring velocities from 0.3 m/s to 40 m/s and conforming to domestic & ICAC standards.



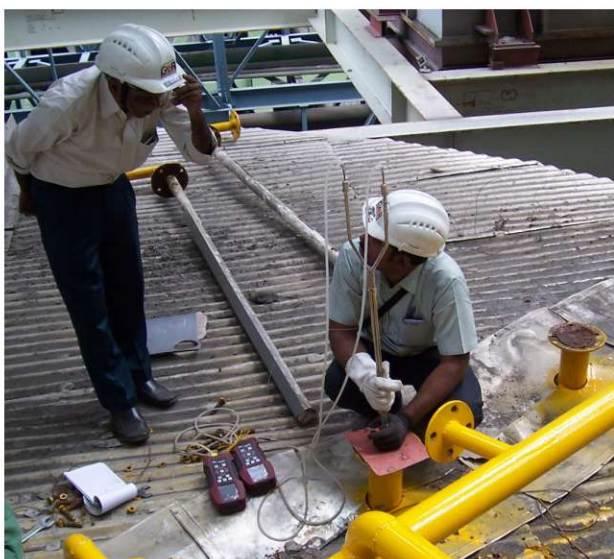
AIR IN LEAKAGE TEST

The air in leakage test is conducted to ensure that the erection weldments are sound & leak proof. This is done as a part of erection activity before insulation work is taken up. The purpose of the test is to identify the leakage sources and arrest them appropriately with suitable welding, thereby reducing the possible leakages when ESP is in operation. GEECO possesses necessary expertise to assess and quantify the leakages with advanced test instrumentation consisting of venturi meter with blower and U tube manometers.

VALIDATION TEST

Pre-tests are conducted for all layouts connecting APH with ESP & ESP with ID Fan systems to get required inputs for CFD optimizations. The purpose is to ensure uniform flow distribution across the cross section in the medium through which fluid is allowed to flow. This distribution also aids in reducing pressure drop across the equipment by which it operates at its best efficiency. This is also further ascertained by post-test, taking grid measurements with pitot tubes, micromanometers & vane type anemometers.

Our other testing include Air / Gas flow equalising test, Cold air velocity test for boiler and Clean air flow test for pulverisers.



AIR LOAD TEST

In ESP, upon completion of all erection activities, air as a medium of load, the voltage is let through the emitting & collecting electrode system gradually to ascertain the healthiness of a particular field. The current is increased in steps of 50 mA till the field receives the full power & the equipment (TR. Set) reaches its full load capacity. During the gradual increase of current & corresponding voltage, there should not be any sparking and if the voltages are nearer to the RMS voltage of full capacity, then it can be concluded that the field is healthy. This procedure shall be repeated for other fields of the ESP.

Performance Guarantee testing is done as per performance test codes and standards of Boiler & Auxiliaries (APH, ESP & Pulverisers) to prove contractual requirements.

RESEARCH AND DEVELOPMENT

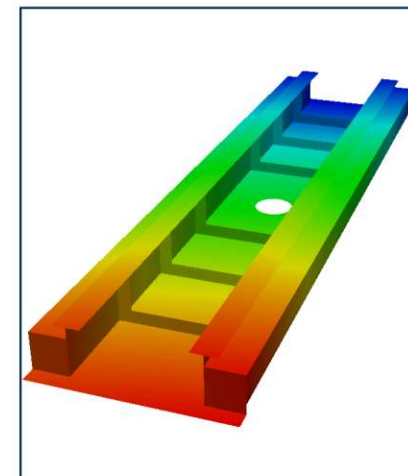
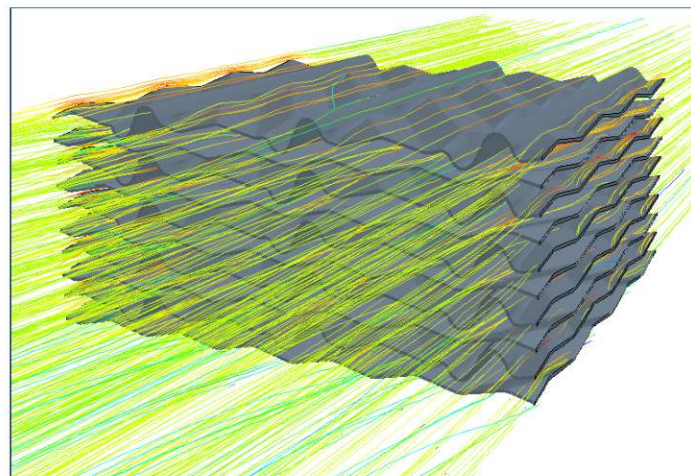
CAPABILITIES

- Develop new Product & Technology to meet customer needs
- In-depth product / process knowledge & expertise
- Optimize operating conditions to significantly improve Performance & Thermal Efficiency
- Solutions to minimize leakage & enhance the life of seals
- Development of new heating element profiles for high heat recovery & easy cleanability
- CFD, FEA & Numerical Modeling to improve product functioning




ACHIEVEMENTS

- GEECO's High Thermal Performance Profile – GHT®
- GEECO's High Cleanability Profile - GCP® & GCF
- GEECO's Leakage Reduction System - GLRS®
- Technology to increase APH diameter with minimal changes
- Guide Vanes to Improve APH Performance
- Improved Soft Touch Radial Seals
- Bi-metallic Leakage Control Seal (TALCON™)



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(EPABX) : 26565694, 26562133
: 26565687, 26562144
: 26562134, 26562122
: 26562134, 26562122
फैक्स/FAX : 26960629, 26529745
Website : <http://www.dsir.gov.in>
(आईएसओ 9001:2008 प्रमाणित विभाग)
(AN ISO 9001:2008 CERTIFIED DEPARTMENT)

सूचना का अधिकार
RIGHT TO INFORMATION



भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
वैज्ञानिक और औद्योगिक अनुसंधान विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग,
नई दिल्ली - 110016
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
New Delhi - 110016

F. No. TU/IV-RD/4459/2019

Dated: 28th March, 2019

To

M/s. Geeco Enercon Pvt. Ltd.
D/C 6 Sidco Industrial Estate
Thuvakudy
Trichy – 620 015

Subject: RECOGNITION OF YOUR IN-HOUSE R&D UNIT(s)

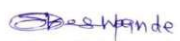
Dear Sir,

This has reference to your application for recognition of your In-House R&D unit(s) by the Department of Scientific and Industrial Research.

2. This is to inform you that it has been decided to accord recognition to the In-House R&D unit(s) of your firm at **D/C 6, Sidco Industrial Estate, Thuvakudy, Trichy** from **22.03.2019 to 31.03.2021**. Terms and conditions pertaining to this recognition are given overleaf.

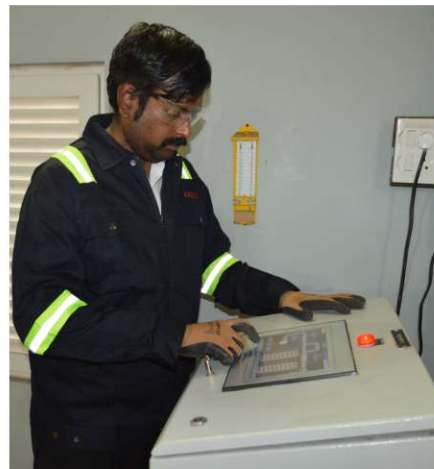
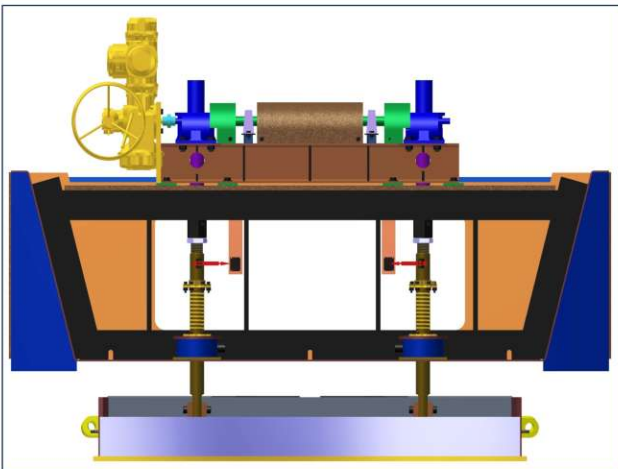
3. Kindly acknowledge the receipt of this letter.

Yours faithfully,

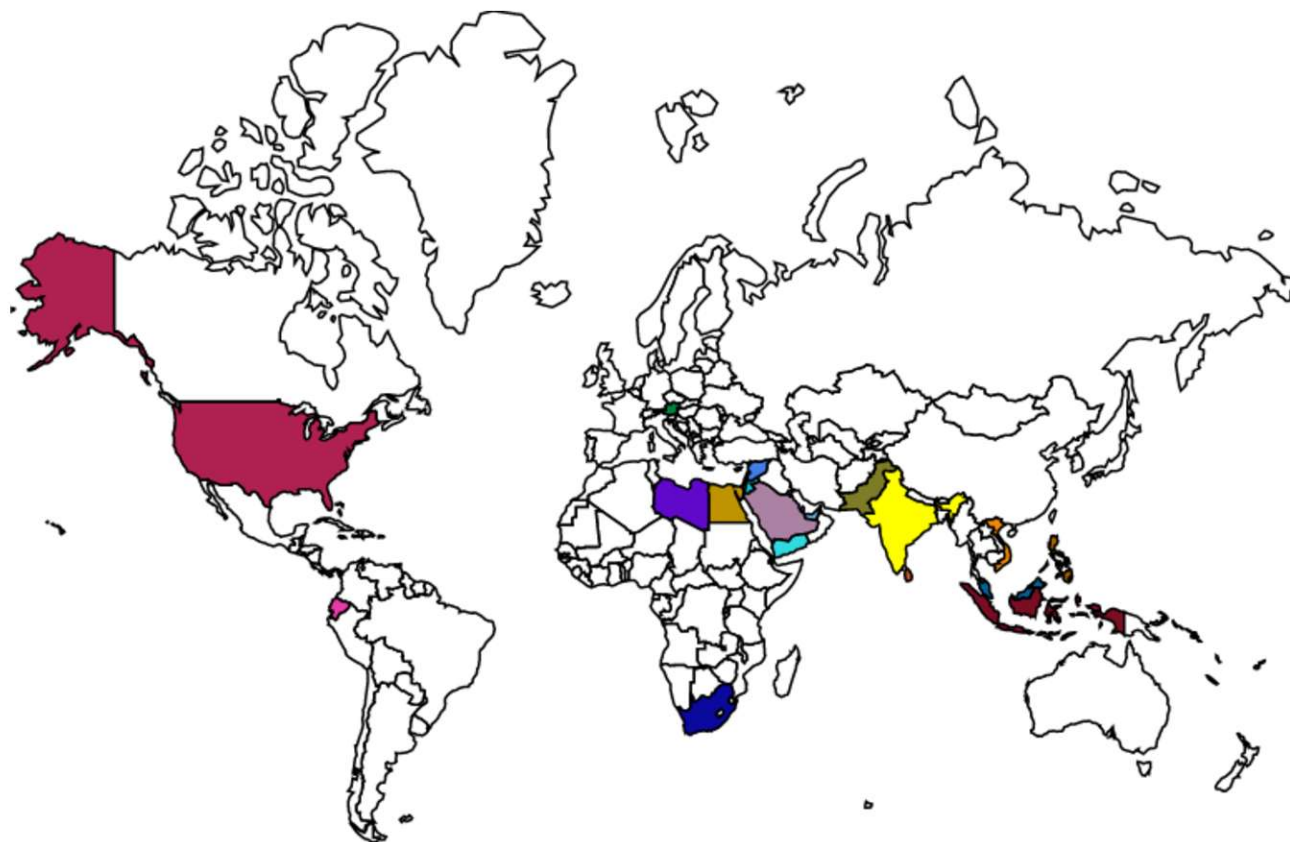

(Dr. S. K. Deshpande)
Scientist-G

CORE ACTIVITIES

- Development of diagnostic tool to continuously monitor health of APH
- Identification of suitable geometry and wear-resistant material for seals to minimize Indirect leakage
- Optimization, Automation and Modification of cold rolling process of heating elements
- Criterion for basket replacement, fouling & cleanability of heating elements
- Installation of Guide Vanes at Inlet & outlet ducts for uniform fluid flow through APH
- Development of APH simulator to predict transient steady-state metal temperature
- Surface modification of hot end elements for erosion resistance
- Improvement in Soot Blowing Process



GLOBAL FOOTPRINT



Austria 	India 	Kuwait 	Pakistan 	Singapore 	UAE 
Cyprus 	Indonesia 	Lebanon 	Panama 	South Africa 	USA 
Ecuador 	Jamaica 	Libya 	Philippines 	Sri Lanka 	Vietnam 
Egypt 	Jordan 	Malaysia 	Saudi Arabia 	Syria 	Yemen 

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E-mail : info@geeco.us
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GEECO Enercon Pvt. Limited

An ISO 9001, 14001, 45001 & 50001 Certified Company

DESIGN | ENGINEERING | RESEARCH & DEVELOPMENT | MANUFACTURING | ERECTION | SERVICE | TESTING