

Consultancies/projects executed listing challenges, scope and direct/indirect impact of the solution

	Organization	Title of Project	Challenge/Scope/Impact
Completed Projects			
1	Crompton Greaves Limited	Analysis and optimization of insulation in power transformers	Exhaustive FEM simulations and determining criteria for margins between strength and stress values – helped the client to reduce material cost for various ratings of transformers for competitiveness
2	Kalpataru Power Transmission Limited	Computation of induced voltages in parallel transmission lines	To find induced voltage in a 220 kV line due to a nearby 400 kV line by determining positive, negative and zero sequence induced voltages due to rated current flowing in the 400 kV line - Understanding of the induced voltage magnitudes at the design stage helps in taking corrective actions
3	Crompton Greaves Limited	Short circuit calculation for 75 MVA, 220/132/33 kV transformer	Temperature rise computations during the short-circuit period for reliability assessment
4	KEC International Limited	Induced voltage calculations for transmission lines	To find induced voltage in 220 kV and 30 kV lines due to a nearby 400 kV line by determining positive, negative and zero sequence induced voltages due to rated and fault currents flowing in the 400 kV line: Understanding of the induced voltage magnitudes at the design stage helps in taking corrective actions
5	KEC International Limited	Impedance calculations for 115 kV and 500 kV transmission lines	Calculation of resistance and reactance taking into account temperature and skin effects
6	MSEB	Inspection of single-phase and three-phase static meters	Checking test certificates and calibration reports
7	GE India Business Center	Estimation and control of circulating currents in power transformer clamping structure	Understanding and interpreting results of 3-D FEM analysis of a power transformer - helped the client in understanding the root cause for the circulating currents and eliminating them
8	KEC International Limited	Calculation of homopolar, direct and inverse impedances of transmission lines	Computation of positive, negative and zero sequence impedances for HV transmission lines

9	MSEB	Analysis of transpositions on 400 kV transmission line	Study is done to analyze the effect of addition of a tapped loop in loop out line in the existing 400 kV transmission line. Impedances are calculated using Carson's formulae. Voltage drops in various sections of the lines are added together to find the total voltage drop across the line by using the given values of currents and their direction.
10	Crompton Greaves Limited	Technical consultancy in the area of transformers	Advised the client on various aspects of transformer engineering
11	KEC International Limited	Computation of reactances, electric and magnetic fields, and unbalanced voltages for transmission lines	Computation of the positive, negative and zero sequence impedances for a 400 kV transmission line, determining of induced unbalanced voltages on account of non-ideal transposition schemes, and computing electric and magnetic fields at the ground level
12	ANSYS India	Theory and applications of low frequency electromagnetics	Imparted technical training to employees and clients of ANSYS (one of the top commercial FEM software)
13	ANSYS India	Technical consultancy for low frequency computational electromagnetics	Imparted technical training to employees and clients of ANSYS
14	ALSTOM India Projects Limited	Consultation for low frequency electromagnetics	Advised the client on how to use FEM for assessing performance of static and rotating electrical machines
15	Godrej & Boyce Mfg. Co. Ltd	Technical calculations for bus-bar system	Calculations of voltage drops and currents under normal and short-circuit conditions
16	Altair Engineering	Consultations on low frequency electromagnetics	Imparted technical training to client's employees about computational electromagnetics
17	Ashok Transformers Pvt. Ltd.	Consultation on 'Analysis of load loss of a transformer'	Helped the client to understand the root cause of substantial circulating current between parallel conductors and to take corrective actions
18	Global R&D Centre, Crompton Greaves Ltd	General consultancy services	Advised the client on various aspects of R&D areas of power transformers
19	Transrail	Impedance and EM field calculations for transmission lines	Computation of the positive, negative and zero sequence impedances for a transmission line and computing electric and magnetic fields at the ground level

20	CGL	Consultancy services for evolving technology strategy	Advised the top management of the client for determining priority areas in the area of power transformers
21	GE-BEL	Consultations for construction Faraday cage to reduce electromagnetic interference	Helped the client to design a Faraday cage to reduce to and fro electromagnetic interference; ambient interference level was achieved well below the desired mark
22	Pradeep Sales and Servies	Consultancy on voltage regulator and relay	Advised the client on calculations useful in designing voltage regulators and relays
23	CGL	Consultancy services in areas related to transformers	Advised the client on various aspects of transformer engineering
24	PGCIL	Consultancy services in areas related to transformers	Advised the client on various aspects of design and specifications of power transformers and transformer-system interactions
25	L&T Construction	Study on failures of Traction Transformers	Analysis of voltage stresses due to switching transients of vacuum circuit breakers and recommendation of corrective measures to suppress the transients
26	Shrihans Electricals Pvt Ltd	Advice on design of air core reactors	The challenge was to make current distribution between parallel layers equitable. Mutual inductances between layers make it a difficult problem even when self inductances are equalized.
27	Lucy Electric India	Advice on reducing partial discharge levels	The scope included understanding probable sources of high partial discharge levels in client's product and suggesting corrective measures. It also involved helping the client to do Finite Element Analysis for correctly simulating high electric field areas in the product.
28	Adani Infra Management Services Ltd	Advice on investigation of a magnetic circuit problem of a 765 kV shunt reactor	The scope included helping the client to understand a phenomenon leading to high temperatures in yoke portions
29	Honeywell Technology Solutions Pvt. Ltd.	Consultancy on Electromagnetic Fields Associated With Development of a Product	The client was advised on electromagnetic concepts associated with a product under development and on future work that should be carried out

30	Madhya Pradesh Power Transmission Company Ltd	Analysis of failure of 400/220/33 kV ICTs at 400 kV substation Bina and suggesting remedial measures	The scope includes carrying out simulations on power system analysis softwares and FEM analysis to study the failures of the ICTs
31	Wind World India	Transformer Failure Analysis	The consultancy work involved helping the client for taking corrective and preventive actions based on site visits and discussions
32	Shrihans Electricals Pvt Ltd	Advice on magnetic clearances and quality factor of air core reactors	The scope includes giving guidelines for magnetic clearances in the radial and directions, Q factor variation with different design features
In-Progress			
33	Pragati Electricals Pvt Ltd	Advisory Type Consultancy on Finite Element Analysis of Instrument Transformers	To advise on basics of electromagnetics, the theory of the Finite Element Method (FEM), precautions to be taken to avoid errors in FEM, and Finite Element Analysis (electrostatic and magnetic) of Instrument Transformers.