INDUSTRY INSTITUTE PARTNERSHIP CELL
KONGU ENGINEERING COLLEGE
(AUTONOMOUS)
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Energy and Power Quality Audits by KEC

Kongu engineering College (KEC), a leading autonomous institution affiliated to Anna University, Chennai and approved by AICTE is located in Perundurai, Erode District, Tamil Nadu. Since 1984, it offers quality Technical and Management education in 14 UG programmes, 19 PG programmes and 16 Research programmes. Accredited by NBA and NAAC, it has 555 faculty members mentoring more than 8500 students as one of the largest technical institutions of the country.

Major industry oriented extension activities of the college include **Technology business Incubator (TBI)** and **Industry Institute Partnership Cell (IIPC).** These activities are in existence for more than 10 years and they are providing the necessary practical and industry exposure to the faculty and the students.

TBI@KEC , the recipient the coveted national award for the best TBI in the country from the President of India for 2012 , is nurturing, with the support of DST, the local entrepreneurs from concept to commercialization by providing the development infrastructure, funding and mentoring. It has developed about 76 commercial products so far through about 50 incubatees.

IIPC@KEC, originally established with the seed fund from AICTE, is now self sufficient and undertakes consultancy, testing and training activities for the industries. For the three years 2014-17 the cell had undertaken 320 nos of consultancy activities, 728 nos of testing assignments and 263 nos of training programmes. The IIPC was awarded 'A' Excellent as early as in 2003 by the AICTE review team. The AICTE-CII survey for the 4 years - 2013-2016 - has placed all the departments of KEC in the top 10% category of the departments having strong industry linkages. The EEE department was selected as the best industry linked department in National Level during 2013.

IIP Cell of KEC is undertaking **Energy Audits** (electrical energy, thermal energy studies including fuel analysis, boiler and furnace efficiency, steam utilization studies, water and waste water treatment and study for assessing potential for cogeneration) **and Power Quality Audits** as one of the major consultancy activities for the benefit of the nearby industries. Senior faculty members of the college including the professors with **previous Industrial experience** take up the audit work. **Six faculty members** of the college audit team have **BEE certification** as **Energy Auditors** and **two** members as **Energy Managers**.

The methodology followed by the Energy audit team is to visit the plant to understand the total process centres and the related energy consumptions. It collects from the customer, information like power distribution scheme, list of major motors and other energy consuming loads, their operating patterns and the production and energy consumption details over a time. It subsequently undertakes necessary measurements, analyzes the same and provide the report **indicating the energy saving opportunities and the expected saving**.

To take up these activities, the college has at its disposal the following special instruments apart from the other general instruments.

Instrument	Model /Make
Power Quality Analyzers	CA / Krykard 8332, Fluke 435PQ analyzer, Yokogowa instruments
Flue Gas Analyzer	KANE KM9106 Quintox , UK Make
Thermal Imager	Fluke Ti125, US Make
Infrared thermometer	Fluke 59 Max, US Make
Hot wire Anemometer	Extech, US Make
Vane Anemometer	Extech, US Make
Air Quality Meter	Extech, US Make
Grain Moisture Meter	Extech, US Make

Fluke 435 PQ Analyzer

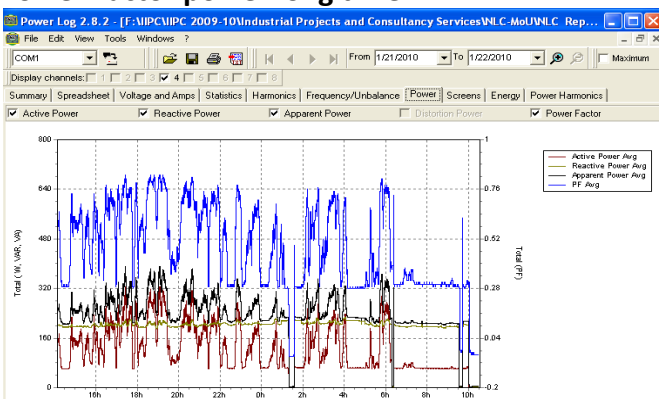
PQ Analyzer CA 8332

Kane-May KM9106 Quintox flue gas Analyzer

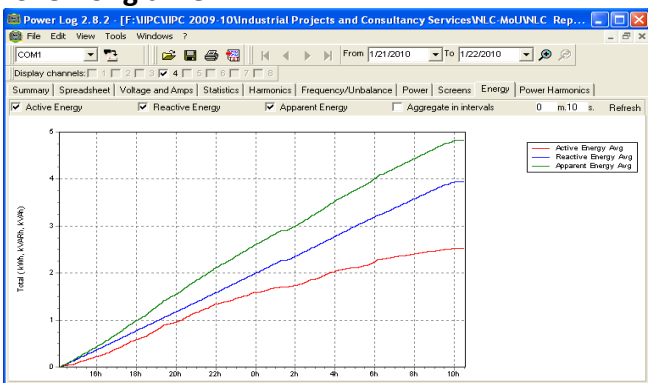
(I). Energy Audit - What it tries to achieve:

1. Identifies Potential areas of improvement with respect to energy consumption, operating and maintenance practices with a view to reducing energy costs and thus overall operating costs.

Recording of Active, reactive, Apparent power, Power Factor power long time



Recording of Active, reactive, Apparent Energy over long time



2. Energy cost reduction allows industries to invest in other quality and technological enhancements for their products apart from improving profitability.

. Focuses on

- Major energy consumption Areas; Monitors variations occurring in energy consumptions
- Availability and dependability of the energy sources and hence suggests the appropriate energy mix
- Incorporation of Energy Conservation Technologies and Equipment under the following three heads:

(a) Without any expense: to be implemented immediately

(b) With some expenses and modifications: break- even to be achieved within 3/6 months.

(c) Major Energy Conservation Equipment : to be implemented after detailed project cost- benefit analysis and ensuring return on investments within 18/ 36 months.

(II). Training the engineers of the Industry on the fundamentals of energy conservation can also be organized based on the needs.

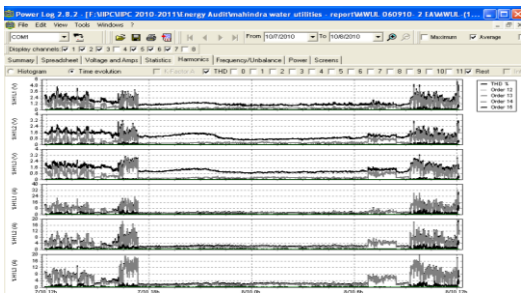
(ii) Power Quality Audit- What it tries to achieve:

1. Goes hand in hand with Energy Conservation Technologies

2. Need to maintain Quality Power to avoid

- Energy losses due to the harmonic currents
- Electrical and protection equipment break down
- Interferences with sensitive electronic circuits
- Hazards like resonance phenomena

Recording of Harmonics Over Long Time



Two case studies undertaken by Kongu Engineering College are uploaded in the Asia Power Quality Initiative (APQI) learning materials' web portal.

http://www.apqi.org/resources/case-study/details.php?id=klhdvtsbc

http://www.apqi.org/resources/case-study/details.php?id=svodyqhrm

Energy Auditing Team of Kongu Engineering College :

S.No.	Name	Educational Qualification	Designation	Discipline	Industrial Experience		
					Name of the Industry	No.of years	Certified Energy Auditor of BEE (YES / NO)
1	Dr.P.Navaneethakrishnan	ME., MBA.,Ph.D.	**Professor & Head Dept. of Mechanical Engineering**	Mechanical	**Bannari Amman Sugars Ltd.**	6 years	YES
2	Dr. R Somasundaram	ME, PGDM, PhD	**Professor & Head Dept. of Management Studies**	Management	Sterling Computers, Chennai.	3 years	YES
3	Dr. K Saravanan	M Tech PhD	**Professor and Head, Dept. of Chemical Engineering**	Chemical	1. Former Project Engineer, 2. The Bombay Oil Industries Pvt. Ltd. Mumbai	2 years	
4	Dr. R Deivasigamani	M Tech PhD	**Professor, Dept. of Mechanical Engineering**	Mechanical	-	-	YES
5	Dr.N Senthilnathan	ME, PhD	**Assistant Professor,** Dept.of Electrical and Electronics Engineering	Electrical	-	-	YES
6	Mr. T.Logeswaran	ME	**Assistant Professor,** Dept. of Electrical and Electronics Engineering	Electrical	-	-	Yes
7	Dr.P.Sathiamurthi	ME PhD	**Professor, Dept. of Mechanical Engineering**	Mechanical	-	-	NO
8	Dr.P.Selvakumar	M Tech PhD	**Assistant Professor, Dept. of Mechanical Engineering**	Mechanical	-	-	NO

List of Certified Energy Auditors / Energy Manager by Bureau of Energy Efficiency, Ministry of Power, Government of India, New Delhi

S.No.	Name	Educational Qualification	Designation	Discipline
1.	Dr. N Senthilnathan	ME PhD	**Professor and Head, Dept. of Electrical and Electronics Engineering**	Electrical
2.	Dr. R Deivasigamani	M Tech PhD	**Professor, Dept. of Mechanical Engineering**	Mechanical
3.	Dr.P Navaneethakrishnan,	ME PhD, MBA	**Professor and Head, Dept. of Mechanical Engineering**	Mechanical
4.	Dr. R Somasundaram	ME, PGDM, PGDFTM, PhD	**Professor and Head, Dept. of Management Studies**	Management
5.	Mr. T.Logeswaran	ME	**Assistant Professor,** Dept. of Electrical and Electronics Engineering	Electrical
6.	Dr.R.Meenakumari	ME PhD,	**Professor, Dept. of Electrical and Electronics Engineering**	Electrical
7.	Mr.P.Gowrishankar	ME	**Assistant Professor,** Dept. of Electrical and Electronics Engineering	Electrical

Partial Clients' List of Energy and Power Quality Audits:

Amsam Spinning Mills (P) Ltd, Amarjothi Spinning Mills Ltd,SIPCOT, A.C. Ramasamy Raja Polytechnic College, BPL Telecom P (Ltd), CARD@Neyveli lignite corporation, Compact Spinners (India) Pvt. Ltd, Dharmapuri Paper & Boards Ltd, Jamuna Textiles, Jayavarma Textiles P(Ltd), Karthikeya Paper & Boards Ltd, Kongu Arts and Science College, Kangayam Rice Mill Cluster, Mahindra Water Utilities Ltd, Mehala Carona Textile (P) Ltd, Mothi Spinner Ltd, Maharaja Sathyam Industries (P) Ltd, Modern Cotton Yarn Spinners ltd, NLC Neyveli, Premier Rotary Mills, Rengaraj Ispat Industries, Sri Ratna Lakshmi Spinning Mills Ltd, Subburaj Textile Mills (P) Ltd, Subburaj Spinning Mills (P) Ltd, , SKM Egg Products Export (India) Ltd, Saravana Polythreads, Sakthi Auto components, Sree Kumaran Thanga Maligai, Shakthi Knitting Ltd, Swastic Industries, TEKIC, United Bleachers Ltd, Seshasayee Paper and Boards ltd, Erode, Venbro Polymers, Erode. SEPR Refractories India Pvt, Ltd, Perundurai, V.Thangavel & Sons P (Ltd), M/s Ponni Sugars (Erode) Ltd.