



Indra Ganesan

COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 7

INSTITUTIONAL VALUES AND BEST PRACTICES

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

INDRA GANESAN COLLEGE OF ENGINEERING





Dr. G. Balakrishnan, M.E. Ph.D.,
Principal

Indra Ganesan

COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(D) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikendam, Tiruchirappalli - 620 012

Date:

TO WHOMSOEVER IT MAY CONCERN

7.1.2: The Institution has facilities and initiatives for

1. Alternative sources of energy and energy conservation measures
2. Management of the various types of degradable and non degradable waste
3. Water conservation
4. Green Campus Initiatives
5. Disabled friendly, barrier free environment

Options:

- A. 4 or All of the above
- B. 3 of the above
- C. 2 of the above
- D. 1 of the above
- E. None of the above

Responses: Option A.4 or All of the above

Principal

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikendam, Tiruchy-620 012.



Indra Ganesan
COLLEGE OF ENGINEERING
Madurai Main Road (NH-45B), Manikandam, Tiruchirappalli - 620 012
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
NAAC Accredited, 2(F) Status Institution by UGC



7.1 Institutional Values and Social Responsibilities

7.1.3 Quality audits on environment and energy regularly undertaken by the institution. The institutional environment and energy initiatives are confirmed through the following

- 1 Green Audit / Environment Audit**
- 2 Energy Audit**
- 3 Clean and Green Campus Initiatives**
- 4 Beyond the Campus Environment Promotion Activities**

**POLICY DOCUMENT ON ENVIRONMENT AND
ENERGY USAGE CERTIFICATE FROM THE
AUDITING AGENCY**



Indra Ganesan

COLLEGE OF ENGINEERING

Madurai Main Road (NH-45B), Manikandam, Tiruchirappalli - 620 012

Approved by AICTE, NewDelhi & Affiliated to Anna University, Chennai

NAAC Accredited, 2(F) Status Institution by UGC



Criterion 7	Institutional Values and Best Practice	100
--------------------	---	------------

Key Indicator 7.1 – Institutional Values and Social Responsibilities

7.1.3 Quality audits on environment and energy regularly undertaken by the institution. The institutional environment and energy initiatives are confirmed through the following

- 1 Green Audit / Environment Audit**
- 2 Energy Audit**
- 3 Clean and Green Campus Initiatives**
- 4 Beyond the Campus Environment Promotion Activities**

Responses: [Option A.4](#) or [All of the above](#)

**POLICY DOCUMENT ON ENVIRONMENT AND
ENERGY USAGE CERTIFICATE FROM THE
AUDITING AGENCY**

7.1 Institutional Values and Social Responsibilities

7.1.3 Quality audits on environment and energy regularly undertaken by the institution. The institutional environment and energy initiatives are confirmed through the following

- 1 Green Audit / Environment Audit**
- 2 Energy Audit**
- 3 Clean and Green Campus Initiatives**
- 4 Beyond the Campus Environment Promotion Activities**

**POLICY DOCUMENT ON ENVIRONMENT AND
ENERGY USAGE CERTIFICATE FROM THE
AUDITING AGENCY**

ENERGY AUDIT REPORT



**INDRA GANESAN COLLEGE OF ENGINEERING
MANIKANDAM, TRICHY – 620012, TAMILNADU**

**Dr. G. Balakrishnan, M.E., Ph.D.,
Principal**

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

AUDIT CONDUCTED BY

YOJO NETWORK & TRAINING CENTER

(Registered Audit Agencies)

GST no: 33AYXPP0304R1ZT

(Chennai ♦ Kumbakonam ♦ Karaikal)

Mobile: +91-9047205733

E-mail: yojoauditnetwork@gmail.com





YOJO NETWORK & TRAINING CENTER
(Registered Audit Agencies)
1st Floor, Devas Complex, Mutt St
Kumbakonam - 612 001
Mobile: +91 9047205733

GST no: 33AYXPP0304R1ZT
E-mail: yojoauditnetwork@gmail.com
(Chennai ♦ Kumbakonam ♦ Karaikal)


ACKNOWLEDGEMENT

Yojo Network & Training Center is thankful to the Board of Management, Head of Institution, Faculty and Technical team members of **INDRA GANESAN COLLEGE OF ENGINEERING** for providing an opportunity to conduct a detailed Energy Audit process in the college premises. It is our great pleasure which must be recorded here that the Management of **INDRA GANESAN COLLEGE OF ENGINEERING** extended all possible support and assistance resulting in thorough completion of the audit process. The audit team appreciates the co-operation and guidance extended during the course of site visit and measurements. We are also thankful to all those who gave us the necessary inputs and information to carry out this very vital exercise of Energy Audit.

Finally, we offer our sincere thanks to all the members in the engineering division/technical /non- technical divisions and office members who were directly and indirectly involved with us during collection of data and while conducting field measurements.

Audit Team Members

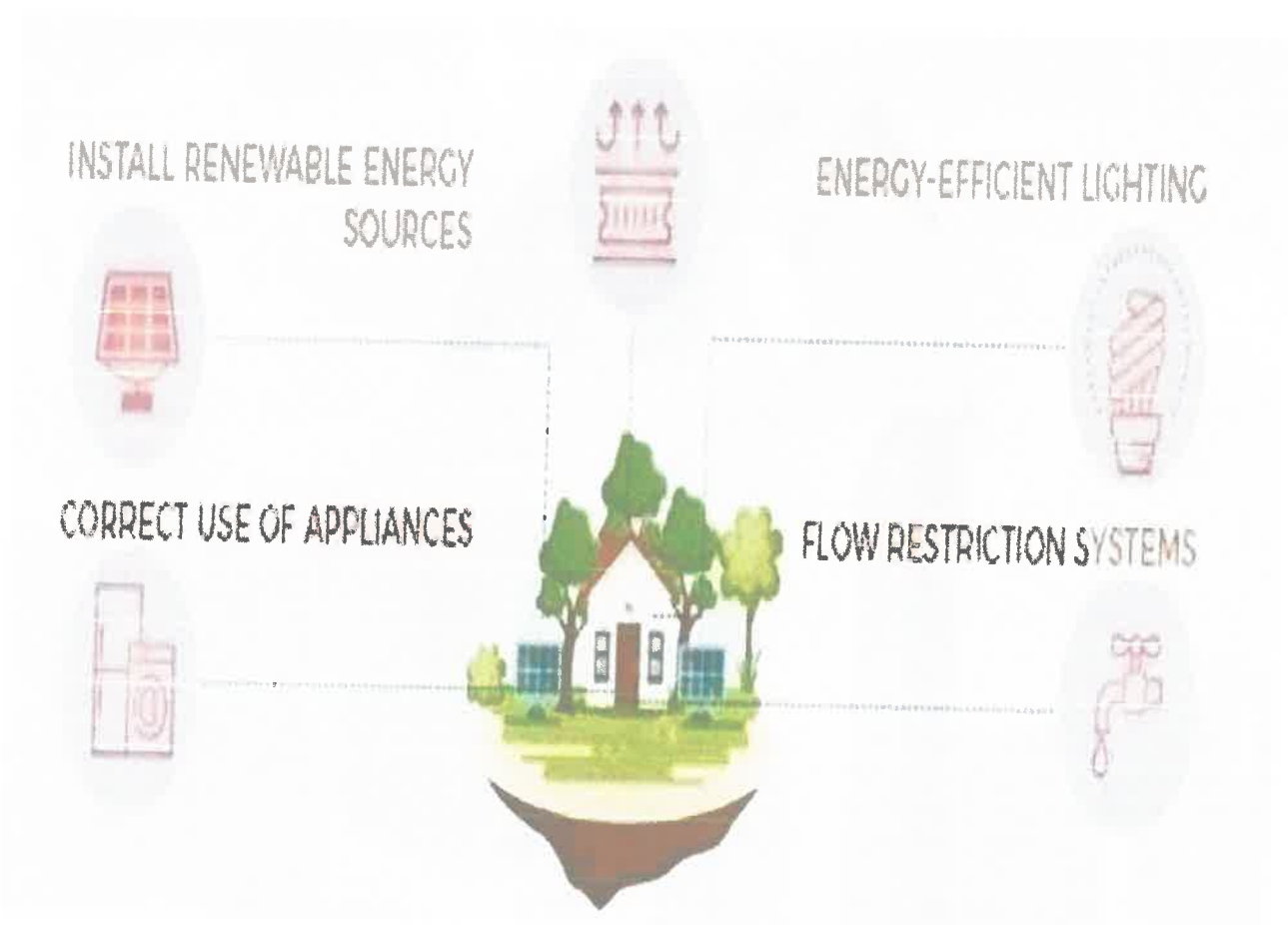
Er. V. Marimuthu., B.E., Er. C. Saravanakumar., B.E.,	UKAS Certified Energy Auditor (KQ-233) Lead Auditor-ISO-9001:2015,14001:2015(EMS), UKAS, KQ Reg., COC. Carbon Footprint Auditor Mobile:+91-9047205733
Er. R. Rajkumar, B.E.,	Audit Associate



Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

ENERGY AUDIT REPORT

INTRODUCTION TO ENERGY AUDIT

5 IDEAS FOR A SUSTAINABLE INSTITUTION




Dr. G. Balakrishnan, M.E., M.Tech.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.



YOJO NETWORK & TRAINING CENTER
(Registered Audit Agencies)
1st Floor, Devas Complex, Mutt St
Kumbakonam - 612 001
Mobile: +91 9047205733

GST no: 33AYXPP0304R1ZT
E-mail: yojoauditnetwork@gmail.com
(Chennai ♦ Kumbakonam ♦ Karaikal)

1.1 : Preface about the Institution:

INDRA GANESAN COLLEGE OF ENGINEERING was seeded by Indra Ganesan Educational Trust in the year 2008 with seven UG and three PG courses to inculcate quality education for rural students. This institute is located on the outskirts of Tiruchirappali, about 8 kilometers from Tiruchirappali junction and almost in a rural atmosphere.


The undergraduate courses offered are - Agricultural Engineering, Computer Science and Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Information Technology, Mechanical Engineering and AIDS and Mater of Business Administration. This College has a good digital library with high-speed internet facilities to the benefit of students and faculty. The well equipped library with number of International and National Journals and Magazines. This College has well-qualified faculties, modern infrastructure with well-equipped laboratories. The building has G+4 floors with a total carpet area of 1,58,681 Sq. feet. This College got permanent affiliation for five Departments - Computer Science and Engineering, Electronics and Communication Engineering, Information Technology, Mechanical Engineering and Mater of Business Administration.

1.2 : Quality Policy:

INDRA GANESAN COLLEGE OF ENGINEERING maintains various policies to enhance the growth of the students, staff along with the growth of the Institution.

The policies are as follows:

- GREEN POLICY
- CODE OF CONDUCT
- ENVIRONMENT POLICY
- ENERGY POLICY
- WASTE MANAGEMENT POLICY
- E-GOVERNANCE POLICY


Dr. G. Balakrishnan,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikādam, Trichy-620 012.

1.3 : Scope of the Audit Process:

- **Energy Audit:** To conduct a detailed energy audit in the college campus with a main focus to identify judicious usage of electrical and thermal energy (where, when, why and how energy is being utilized).

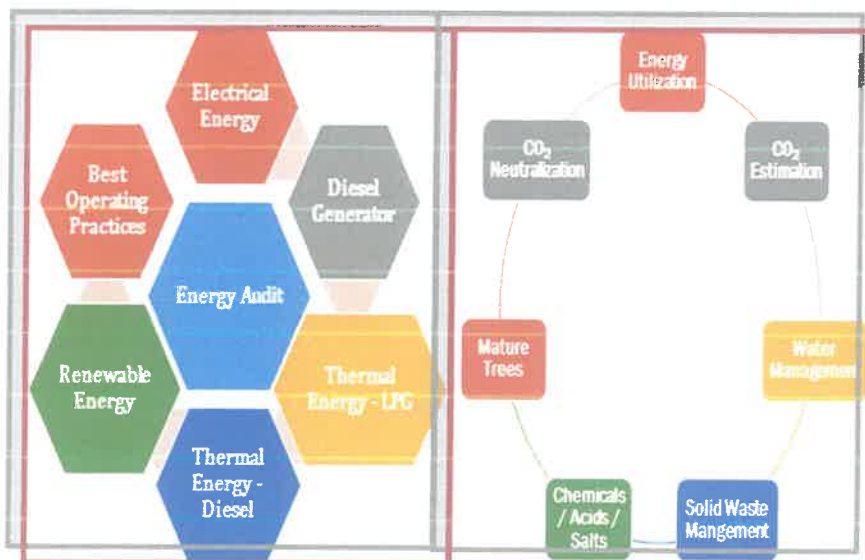
1.4 :Outcomes of the Audit Process:

- Recommendations based on field measurement with achievable **Energy Conservation (ENCON)** proposals under **No cost / Low cost and Cost investment categories.**
- **Minimization of present energy cost** by adjusting and optimizing energy usage and reduction of energy wastage without affecting the regular activities.
- **Identification of possible cost and energy saving from energy conservation.**

1.5 :Standards Used:

- Bureau of Energy Efficiency Guidelines to conduct the detailed energy audit process.
- **ISO 14064-Part-1** – Specification with guidance at the organization level for quantification and reporting of GHG emissions and removals (Second Edition).
- **ISO 14064-Part-2** – Specification with guidance at the project level for quantification, monitoring and reporting of GHG emissions reductions or removal enhancement (Second Edition-2019).
- **ISO 14064-Part-3** – Specification with guidance for the verification and validation of GHG statements (Second Edition-2019).
- The Green house Gas Protocol- a Corporate Accounting and Reporting Standard (Revised Edition) released by World Resources Institute & World Business Council for Sustainable Development – 2014.

1.6 : Coverage in Energy Audit Process:




Dr. G. Balakrishnan,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

1.7 : List of Faculty Members Involved in Audit Process & Data Collection:


S. No.	Faculty Details	Contribution
1.	Dr. R. Bharathkumar AP/ Dept. of ECE	Overall Coordinator for the Audit Process.
2.	Mr. D, Praveen AP/ Dept. of EEE	Collection of Electrical Energy Parameters from College & Hostel.
3.	Mr. M. Elangovan AP/ Dept. of EEE	Collection E.B utility & D.G Details.
4.	Dr. Saravanan Principal & Chairperson IQAC New Prince Shri Bhavani College of Engineering and Technology, Medavakkam, Chennai	External Member




Dr. G. Balakrishnan, Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

ENERGY AUDIT REPORT

STUDY ON ENERGY CONSUMPTION & GENERATION PATTERN


Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

AUDIT CONDUCTED BY

YOJO NETWORK & TRAINING CENTER

(Registered Audit Agencies)

GST no: 33AYXPP0304R1ZT

(Chennai ♦ Kumbakonam ♦ Karaikal)

Mobile: +91-9047205733

E-mail: yojoauditnetwork@gmail.com






YOJO NETWORK & TRAINING CENTER
 (Registered Audit Agencies)
 1st Floor, Devas Complex, Mutt St
 Kumbakonam – 612 001
 Mobile: +91 9047205733

GST no: 33AYXPP0304R1ZT
 E-mail: yojoauditnetwork@gmail.com
 (Chennai ♦ Kumbakonam ♦ Karaikal)

1.1 Assessment of Existing Electrical and Thermal Energy Systems

S. No.	Description	Details				
Electrical Energy (Consumption)						
1.	Name of the customer (As per the utility bill)	THE SECRETARY INDRA GANESAN COLLEGE OF ENGINEERING				
2.	Type of Utility Supply Service No. & Tariff.	LTSC. No: 06-229-013-451				
3.	Tariff Structure	Rs.12.00/kWh+Rs.120/ kw as demand charges (fixed charges accounted for the sanctioned demand)				
4.	Energy Suppliers	Tamil Nadu Generation & Distribution Corporation (TANGEDCO)				
5.	Permitted Demand (PD)	SC.No: 06-229-013-451–100.0 kW				
6.	Capacity of Diesel Generator (DG) Sets	128 KVA–1 No.				
		All are air-cooling. Internal fuel tank & separate earthing done				
7.	Annual Electricity Consumption (kWh)	2018-19	2019-20	2020-21	2021-22	2022-23
		48322	47636	27857	48153.5	47694
8.	Annual Electricity Generation from DG (kWh)	1245	1342	624	1343	1352
9.	Annual Diesel Consumption for DG (L)	4,332	4,445	1,269	4,941	4,155


Dr. G. Balakrishnan, M.E., Ph.D.,
 Principal
 Indra Ganesan College of Engineering
 IG Valley, Madurai Main Road
 Manikandam, Trichy-620 012.

Thermal Energy (Consumption)						
10.	Types of Thermal Energy Used	Liquefied Petroleum Gas (LPG)			Cooking	
		Diesel (Ordinary)			Transport + DG	
11.	Annual LPG Consumption (kg)	2018-19	2019-20	2020-21	2021-22	2022-23
		1,611	1,611	349	1,815	1,510
12.	Annual Diesel Consumption for Transport (L)	7605	7562	1372	7645	7630
General Loads (Both Electrical and Thermal)						
13.	Lighting System	Indoor lighting: LED based Energy efficient lamps				
		Outdoor lighting: All the street lightings are LED based Energy efficient lamps (20W).				
14.	Fan Loads(Ceiling)	<ul style="list-style-type: none"> All the indoor ceiling fans are conventional fans 				
15.	HVAC System	<ul style="list-style-type: none"> Unitary air conditioning system installed in the Required places Most of the AC units are Three star rated and the outdoor units are mostly placed in sunshade Total capacity of the AC system is 20 TR 				
16.	Motors and Pump loads	<ul style="list-style-type: none"> Mainly used for water distribution and purification Small motors are used in kitchen equipments 				
17.	Uninterrupted Power System (UPS)	<ul style="list-style-type: none"> All the computers, servers, surveillance systems, projectors, telephonic units are connected with UPS with nominal back up time of 15-30 min The total capacity of the UPS is 60 KVA 				




Dr. G. Balakrishnan, M.E., Ph.D.,
 Principal
 Indra Ganesan College of Engineering
 IG Valley, Madurai Main Road
 Manikandam, Trichy-620 012.



YOJO NETWORK & TRAINING CENTER

(Registered Audit Agencies)

1st Floor, Devas Complex, Mutt St

Kumbakonam – 612 001

Mobile: +91 9047205733

GST no: 33AYXPP0304R1ZT

E-mail: yojoauditnetwork@gmail.com

(Chennai ♦ Kumbakonam ♦ Karaikal)

1.2 : Recommendations and Best Operating Practices:

- All SSB must be fitted with digital energy meters and the readings must be taken daily. Or connect those meters with EMS and monitor the energy pattern of each building.
- Prepare block wise maintenance check list of electrical and thermal systems.
- Calculate the Unit per Liter (UPL) for every run of DG and average it for monthly.
- Install AIRCON energy saver gadget which works on dynamic un-saturation principle with the sensor algorithms so that the air conditioners run hours are cut by 20 to 25%
- Similar to Fan, now BLDC based ACs are made available in the market; which consumes less amount of energy (Power) during its starting and running condition.



Dr. G. Balakrishnan, M.E., F.I.E.

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

AUDIT SUMMARY & CONCLUSION



Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Sankarandam, Trichy-620 011



YOJO NETWORK & TRAINING CENTER

(Registered Audit Agencies)

1st Floor, Devas Complex, Mutt St

Kumbakonam – 612 001

Mobile: +91 9047205733

GST no: 33AYXPP0304R1ZT

E-mail: yojoauditnetwork@gmail.com

(Chennai ♦ Kumbakonam ♦ Karaikal)

SUMMARY OF THE AUDIT PROCESS:

In order to make **INDRA GANESAN COLLEGE OF ENGINEERING** Campus 100% energy efficient, the audit team recommends implementing the following measures:

i. Energy Conservation & Management – Electrical Energy:

- Implement Energy Management System (EMS) to accurately measure & monitor energy flow
- Prepare a policy plan to convert the distributed UPS layout into centralized UPS and save energy. This step also saves the maintenance time due to reduction in number of batteries
- Diesel flow meter must be fitted with each DG and calculate the UPL accurately
- Prepare suitable formats for all energy consumption and regularly follow the records. Make proper corrections; if it deviates from the standard operating procedure.

ii. Energy Conservation & Management – Thermal Energy:

- Regularly cleaned stove burners and ensured that the flame in light bluish color in the kitchen.




Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

COMPLETION OF THE REPORT

This report is prepared as a part of the Energy Audit process conducted at **INDRA GANESAN COLLEGE OF ENGINEERING, Trichy** by **YoJo Network and Training Center, Tamilnadu.**



[Signature]
LEAD AUDITOR
YOJO NETWORK
MALI STREET
KUMBAKONAM-612 001
TAMILNADU DR. I

A handwritten signature in green ink, appearing to be "G. Balakrishnan", with a checkmark-like flourish at the end.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.



YOJO NETWORK & TRAINING CENTER

(Registered Audit Agencies)

1st Floor, Devas Complex, Mutt St

Kumbakonam – 612 001

Mobile: +91 9047205733

GST no: 33AYXPP0304R1ZT

E-mail: yojoauditnetwork@gmail.com

(Chennai ♦ Kumbakonam ♦ Karaikal)

CERTIFICATE FOR ENERGY AUDIT PROCESS

This is to certify that, we have conducted the ENERGY AUDIT at **INDRA GANESAN COLLEGE OF ENGINEERING**, Manikandam, Tiruchurappali Dt, Tamil Nadu, India from 10 April 2023 to 12 April 2023 and it is **appreciated that, the institution strictly follows energy conservation measures for the use age of electrical and thermal energy.**

This process investigates the following activities;

- ✓ **Conduction of detailed energy audit for electrical and thermal energy usage in the college campus and identify the energy conservation measures followed in the Institution**
- ✓ **Minimization of present energy cost by adjusting and optimizing energy usage and reduction of energy wastage without affecting the regular activities.**
- ✓ **Identification of possible cost and energy saving from energy conservation.**
- ✓ **Recommendation for SSB may be fitted with digital energy meters and the readings must be taken daily. Or connect those meters with EMS and monitor the energy pattern of each building**
- ✓ **Recommendation to install AIRCON energy saver gadget so that the air conditioners run hours are cut by 20 to 25%.**
- ✓ **Recommendation to use BLDC based ACs is made available in the market; which consumes less amount of energy (Power) during its starting and running condition.**



Thank You

Dr. G. Balakrishnan, M.E., Ph.D.,

Page 14 of 14

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

