INSPIREEE

Inspirational Scripts, Personalities and Innovative Research of EEE

NEWS LETTER EEE/ VOLUME 12:ISSUE 1

September - 2023-2024

K.L.N.COLLEGE OF ENGINEERING

(An Autonomous Institution,
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
(Accredited by NAAC for 5 Years W.e.f November 2018) (Accredited by NBA for EEE)
(An ISO 9001:2015 Certified Institution)
Pottapalayam -630612,Sivagangai District,Tamilnadu

INSPIREEE

IN spirational **S**cripts, **P**ersonalities and **I**nnovative **R**esearch of **EEE**

VISION OF THE DEPARTMENT

To become a high standard of excellence in Education, Training and Research in the field of Electrical & Electronics Engineering and allied applications following Ethical values and Social commitment.

MISSION OF THE DEPARTMENT

1. To create graduates possessing excellent knowledge and skill in Electrical and Electronics Engineering fundamentals.
2. To provide employable graduates for industry and to do high quality research.
3. Emphasis on Ethics, professional conduct for societal development.

K.L.N. College of Engineering (Autonomous)

Pottapalayam–630612, Sivagangai District, TamilNadu,I ndia

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MESSAGEFROMHEADOFTHEDEPARTMENT

Dr.S.M.KANNAN,M.E.Ph.D., FIE,

MISTE, MIEEE (USA)

Professor&Head,EEE,

K.L.N.CollegeofEngineering

MESSAGE

Greetings,

I am very happy to inform that the EEE Department got Accredited, 5th time by NBA, New Delhi. It is a very prestigious moment for us. I wish to thank, in this occasion, all the well-wishers of KLNCE-EEE for their kind support and valuable assistance.

Issues 1 have been nicely prepared starting with beautiful cover page. Topics focusing latest trends in EEE filed covering FACTS, Smart Grid etc., are well informed. The articles by Final year students show their dedicated work, presenting the material in a nice manner, and their depth of knowledge. The fourth issue is focusing on social impact of Electrical field. Their presentation is also very good. Engineers should develop such writing skills, once they reached the quality, they are the expert. Engineers can acquire the best of their writing skills by reading Novels, Newspapers and watching best Hollywood movies. Once they develop such skills, their writing will like a thriller, everyone love to read, and thereby the reader get benefitted. Students can claim later, any where about their contribution on the work they submitted for the Newsletter. I thank the contributors of this issue for publishing as per the schedule. Best wishes to all.

Dr.S.M. KANNAN

Head of the Department-EEE

EDITORIALCREW

EDITORIN-CHIEF:

Dr.S.M.KANNAN[Professor &Head]

EDITOR:

Mr.R.JEYAPANDIPRATHAP[Assistant Professor2]

STUDENTIN-CHARGE:

1. **JOSHUA S 212303 IVYEAR/VIISem**
2. **RAJA PRIYADHARSHINI D 222309 IIIYEAR /V Sem**
3. **VISHWA M 232310 IIYEAR/IIISem**

POSTERCREATION:

M.D.KANAKARAJAN,M.A.,PGDCA[LabInstructor]

Staff publications in journal/conference:

JOURNAL

1. Dr. S Venkatanarayanan N. Rajeswari, "An Efficient Honey Badger Optimization Based Solar MPPT Under Partial Shading Conditions Intelligent Automation & Soft Computing, vol. 35, no.2, pp. 1311–1322, 2023, ISSN 1079- 8587, Scopus index.
2. Dr.S.M.Kannan, Prof/EEE V.R.IyyappanM.Vimal Raja Design of Quadratic High Gain Boost Converter For Electric Vehicle Charging Applications International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
3. 2. Dr. S.Venkatesan, Prof/EEE Surya.MKirishsharvesh.K.B Krishna kumar.E.J Automatic Solar Tracking System Using Heliodrive International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
4. 3. Dr.K.Gnanambal, Prof/EEE T.K.IswaryaR.Krithi Smart Traffic Light Controller & Intelligent Ambulance Tracking System International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
5. 4. Dr.K.Gnanambal, Prof/EEE M.KeerthanaV.Prasanna Devi M.BharathiNivetha Design and Implementation of an Intelligent Wheelchair Controlled by Multifunctional Parameter International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
6. Dr.S.Parthasarathy Design and Development of Onboard Charger with smart Monitoring System for Battery Electric Vehicles International Journal Science Development Research Vol8 ; Issue 4 April 2023 ISSN 2455- 2631 6.
7. Dr.S.Parthasarathy Design and Implementation of Optimized Controller for E-Vehicles Journal of Engineering Research and Reports Vol 24, Issue 12, Page 75-88, 2023; ISSN: 2582- 2926 7.
8. Dr.S.Parthasarathy Design and Implementation of Hybrid Harmonic Filter for Converter System Journal of Engineering Research and Reports 22(12): 21-35, July 2022 ISSN: 2582- 292
9. Dr. S Venkatanarayanan N. Rajeswari An Efficient Honey Badger Optimization Based Solar MPPT Under Partial Shading Conditions Intelligent Automation & Soft Computing vol. 35, no.2, pp. 1311–1322, 2023 ISSN 1079- 8587 Scopus index
10. Dr S Venkatanarayanan M. Balamurugan, S. Rubanraj M. Sabarivasan S. Sainagarjun RF based Transformer fault finder International Conference on Power and Energy systems (ICPES'23) VelammalCollege of Engineering and Technology, Madurai 17 -18 March, 2023
11. 9. Dr S Venkatanarayanan, Prof/EEE A bidirectional DC-DC converter fed separately excited DC motor electric vehicle application International Conference Renewable Energy For Electric Vehicle Charging System Sri Vidya College Of Engineering & Technology Viruthunagar 17 March 2023

12. Dr S Venkatanarayanan, Optimizing Operation Indices Considering Different Types of Distributed Generation and Microgrids for Small Island Electrification. International Conference on Emerging Trends in Electrical, Electronic & Communication Technology (ICETEECT'23) Sri RaajaRaajan College of Engineering and Technology, Karaikudi 20th April 2023.
13. Dr S Venkatanarayanan, An Internet of Things (IOT) based Joint Energy Auditing, International Conference on Emerging Trends in Electrical, Electronic & Sri RaajaRaajan College of Engineering 20th April 2023 Energy Conservation and Energy Management System for Industries. Communication Technology (ICETEECT'23) and Technology, Karaikudi
14. 12. A. Marimuthu, ASP/EEE D.HarishK.ManikandanT.Mukesh Design for MultiSource Energy Storage System International Conference on Smart Engineering for Renewable Energy Technologies (ICSERET 2023), Ramco Institute of Technology, Rajapalayam 24-25, March 2023
15. 13. Dr. P.Loganthurai, ASP/EEE P.VarunPandianR.NaveenBalajiV.G.V.Kirrendran GPS Based Supporting System for Blind International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
16. 14. Dr.M.JegadeesanAkashkumar, HariPrasathPrithivi Raj IoT based Single Axis solar Tracking System International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
17. 15. Dr. M. Jegadeesan, ASP/EEE S. Akash Kumar M.R. HariPrasath S.G. Prithivi Raj Single Axis Solar Tracking International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
18. Dr.S.ManoharanDr.K.GnanambalThe Incremental Loading Factor based Maximum Loadability Limit Prediction using Modern Optimization Tools Journal of Engineering Research (JER) Vol 11. No 28, pp.84-89 DOI.No:10.3690 9/jer.VxIx.11507 2023 ISSN (P): 2307- 1877, (O): 2307- 1885 Scopus index
19. 16. DrS.Manoharan, AP P.KannanC.Karthick Kumar M.SelvaBharathi Design and Implementation of Multilevel Inverter for Electrical Vehicles International Conference on Smart Engineering for Renewable Energy Technologies (ICSERET 2023), Ramco Institute of Technology, Rajapalayam 24-25, March 2023
20. 17. Dr.M.GaneshKumari S. Jayashree J. Keerthana V. Preethi Cloud Computing Based Lineman Security System While Working on Transmission line International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023
21. 18. Dr.M.GaneshKumari, AP(Sr.Gr.)/EEE G. Lalitha Alias LatchanaK.SakthiEswariS.Sivasankari Autonomo Rover for Cleaning Photovoltaic Panel International Conference on Smart Engineering for Renewable Energy Technologies (ICSERET 2023), Ramco Institute of Technology, Rajapalayam 24-25, arch 2023
22. 19. M. Jeyamurugan, AP(Sr.Gr.)/EEE R. JeyapandiPrathap, AP/EEE K. Balaji R. Mugesh Automatic Rubber compound Injecting System for Mixing Mill International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023

23. 20. R. JeyapandiPrathap , AP/EEE M. Jeyamurugan, AP(Sr.Gr.)/EEE R. YuvaPrasath K. BharathiDasan R. Gurubarasriram Automatic Maximum Demand Controller with Indication International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 - 18 March, 2023
24. 21. N. VimalRadhaVignesh, AP/EEE R. ShyamKishorre P. Prabakaran Developing and Designing a Smart Library Management System International Conference on Power and Energy systems (ICPES'23) Velammal College of Engineering and Technology, Madurai 17 -18 March, 2023.

Short term courses/seminar/symposium attended by the Staff

S.No.	NameoftheFaculty withDesignation	SEMINAR /WORKSHOP /COURSEATTENDED/ RESOURCEPERSON	DATE/ PLACE
1	Dr.K.Gnanambal, Prof./EEE	Certificate earned by Completing NPTEL OnlineCertification course on "Analog Circuits"	Jan-Mar 2023 (8 Week Course) IIT Bombay.
2.	Dr.S.Parthasarathy, Prof./EEE	Participated in three days PLAST INDIA 2023-An International plastic exhibition EXPO	02.02.2023 to 04.02.2023/ PragatiMaidan, New Delhi-India.
		Participated in Seminar on CII Madurai Zone - Confederation of Indian Industry.	17.02.2023/ Madurai
3.	Dr. S.Venkatanarayanan,Prof./EEE	Delivered a lecture on one day PEACE Awareness Program for the MSME Industries.	20.04.2023/ Sri RaajaRaajan College of Engineering & Technology, Karaikudi.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	15.03.2023to17.03.2023/ District IndustriesCentre,Tiruppattur.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	09.03.2023to11.03.2023/ ict IndustriesCentre, ectorateComplex,Sivagangai.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	04.03.2023/ DistrictIndustriesCentre ,CollectorateComplex, Sivakasi,
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	23.02.2023to25.02.2023/ DistrictIndustriesCentre,IndustrialEstate,Kallakurichi.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	16.02.2023to18.02.2023/ District IndustriesCentre, Ariyalur.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	15.02.2023/ District IndustriesCentre,Valajangaram, Ariyalur.

		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	14.02.2023/ DistrictIndustriesCentre, Tiruppathur.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	27.01.2023to29.01.2023/ DistrictIndustriesCentre, District CollectorateComplex,Thiruvannamalai.
		Delivered a lecture on three days PEACE Training Program for the MSME Industries.	11.01.2023to13.01.2023/ District Industries Centre,District CollectorateComplex,Cuddalore.
4	A.Marimuthu, ASP/EEE	NPTEL–AICTE Faculty Development Programmeon"ElectricVehicles-Part1".	Jan-Feb2023 (4WeekCourse)IITMadras.
5	Dr.M.Jegadeesan, ASP/EEE	NPTEL– AICTE Faculty Development Programmeon"ElectricVehicles-Part1".	Jan-Feb2023 (4WeekCourse)IITMadras.
6	Dr.M.Ganesh Kumari,AP(Sr.Gr.)/EEE	NPTEL–AICTE Faculty Development Programme on"IntroductionToMachineLearning (Tamil)".	Jan-Mar2023 (8WeekCourse)IITMadras.
		ParticipatedinFivedayOnlineFacultyDevelopmentProgramon"ArtificialIntelligenceandData ScienceinImageAnalysis".	13.02.2023 to 17.02.2023/ CMR Institute ofTechnology,Bengaluru.
		Participated & Completed Successfully 30Days Masterclasson "MachineLearning".	11.01.2023to10.02.2023/ Panteche-learningPvt. Ltd.,Chennai.
		Participated in ISTE sponsored a Twoday NationalWorkshopon"ApplicationsofDeepLearning TechniquesinImageRetrieval".	11.01.2023&12.01.2023/ Mangayarkarasi CollegeofEngineering,Madurai.
7	M.Jeyamurugan, AP(Sr.Gr.)/EEE	NPTEL–AICTE Faculty Development Programme on "ElectricVehicles-Part1".	Jan-Feb2023 (4WeekCourse)IITMadras.
		Participated & Completed Successfully 30Days Masterclasson "MachineLearning".	11.01.2023to10.02.2023/ Panteche-learningPvt. Ltd.,Chennai.
8.	M. Balamurugan, AP/EEE	NPTEL–AICTE Faculty Development Programme on"ElectricVehicles-Part1".	Jan-Feb2023 (4WeekCourse)IITMadras.
9.	R.Jeyapandiprathap, AP/EEE	NPTEL–AICTE Faculty Development Programmeon"ElectricVehicles-Part1".	Jan-Feb2023 (4WeekCourse)IITMadras.
		Participated in Three day National Level Virtual Workshop on "Role of Assessment and Accreditation towards Improving the Quality of Education and National Educational Policy Implementation in Higher Educational Institutions".	08.02.2023 to 10.02.2023/ KamarajCollegeofEngineering andTechnology.

		Participated in IPAwareness/Training Program underNationalIntellectualProperty AwarenessMission	16.01.2023/ K.L.N. College ofEngineering.Sivagangai Dt.
		Participated in ISTE sponsored a TwodayNationalWorkshopon“ApplicationsofDeep Learning TechniquesinImageRetrieval".	11.01.2023&12.01.2023 / Mangayarkarasi CollegeofEngineering,Madurai.
10.	N.VimalRadhaVignesh, AP/EEE	ParticipatedinOnlineOneWeekFacultyDevelopment Programmeon“SoftComputingTechniquesinEngineeringApplication".	24.02.2023to03.03.2023/ Velammal College of Engineering and Technology, Madurai.
		Participated in Virtual mode Five daysFacultyDevelopmentProgrammeon“Challenges and new Trends in PowerElectronics".	13.02.2023to17.02.2023/ JCTCollegeofEngineeringandTechnology, Coimbatore.
11.	A.Manoj, AP/EEE	Participated & CompletedSuccessfullyforlearning thecourseof“8051Microcontroller”	22.07.2022to28.01.2023 / BharatAcharyaEducation.
		Participated & CompletedSuccessfullyforlearning thecourseof“8086Microprocessor”	22.07.2022to28.01.2023/ BharatAcharyaEducation.

Short term courses/seminar/symposium organized by the Department:

DATE	TITLE	DETAILS OF RESOURCE PERSON	NO. OF PARTICIPANTS
Date: 28.04.2023 @ 11.10am to 12.50pm **Type:** Expert Talk	**Expert Talk on “Energy Conservation, Smart Grid, Electrical Safety and Distribution Systems”**	**Resource Persons:** Er.A.Ramalingam, AE Training HRD Er.M.Sundarraj, AE Training HRD/ TANGEDCO, Madurai. 	**Participant Details:** Total**:60** Roll:74 [Internal: Students: 60 Nos. B.E –EEE- II Year / IV Semester “A”&“B” Sec] **[**% of attendance=60/74= 81.08%] **Co-ordinator(s):** Dr.M.GaneshKumari,AP(Sr.Gr.)/EEE Dr.P.Loganthurai, ASP/EEE **Organizing Student Chapter:** IEEE **Sponsor & Amount: IIPC&Rs.2000/-**
12.04.2023 **Type:** Symposium **Participant**	State Level Technical Symposium on ECHELON 2K23	**Chief Guest:** Mr.P.Karuppanan,Project Associate, Startup TN Madurai Regional Hub, Dr.K.Srinivasan,Vice President,	**Details:** External**:**82 Students **Co-ordinator(s):** Dr.S.Venkatesan,

		Greaves Cotton Ltd., **Guest of Honour:** Er.B.Vinoth (1998-2002 Batch Alumnus), Manager-Business Development, PenisulaElectronics,Bengaluru. Er.S.P.Ushandren (2000-2004 Batch Alumnus), Regional Terminal Co-ordinator, IMC Limited,Chennai. Er.T.K.Rishikesh (2013-2017 Batch Alumnus), Associate Technical Lead, KLA TencorSoftware,Chennai. 	Prof/EEE Mr.M. Jeyamurugan, AP(Sr.Gr)/EEE Mr.R,Jeyapandiprathap, AP/EEE Mr.A.Manoj, AP/EEE **Sponsor & Amount:** IIPC & Rs.8500/-
28.02.2023 **Type: Technical Program Participant**	National Science Day Scientific Model Contest	Mr.Sureshkumar, Asst.Manager, EID Parry (India) Limited, Sivagangai. 	Total**:** 225 Nos. Students:220Nos Faculty:25 Nos.[Internal] *(All First year students & Faculty members)* **Co-ordinator(s):** Dr.J.K.Subhasini, HOD/Maths Dr.S.Parthasarathy, Prof./EEE **Organizing Student Chapter:** Nil **Sponsor & Amount:**Nil
Date: 11.02.2023 **Type:**CSR/ Awareness Programme	**Conservation of Electrical Energy & Safety**	Er.G.Murugesan, Assistant Executive Engineer, TANGEDCO, Sivakasi 	**Participant Details:** Total**:63** [Internal: Non-Teaching Faculty: 11Nos. Students: 52 Nos. B.E –EEE- II Year / IV Semester "A"&"B" Sec **Co-ordinator(s):** Dr.P.Loganthurai,

			ASP/EEE **Organizing Student Chapter:** Nil **Sponsor & Amount:** Nil
Date: 11.02.2023 @ 11.10am to 12.50pm **Type:** Expert Talk	**Electrical Machines in Power Systems**	Er.G.Murugesan,M.E., Assistant Executive Engineer, TANGEDCO, Sivakasi 	**Participant Details:** Total**:51** Roll:74 [Internal: Students: 51 Nos. B.E –EEE- II Year / IV Semester "A"&"B" Sec]**[**% of attendance=51/74= 68.92%] **Co-ordinator(s):** Dr.P.Loganthurai, ASP/EEE Mr.A.Marimuthu,ASP/EEE, Mr.M.Balamurugan, AP/EEE **Organizing Student Chapter:**IEEE **Sponsor & Amount: IIPC&Rs.1500/-**
Date: 09.02.2023 **Type: Awareness Program**	**Awareness Program on "Intelluctual Property Rights under NIPAM"**	Smt.K.Susi, Examiner of Patents and Design, NIPAM Officer, IntellctualPropertyOffice,Chennai, Government of India. 	**Participant Details:** Total**:**356 [Internal: Non-Teaching Faculty: 30Nos. Students: Nos.326Nos. B.E –II Year &III Year[All Branches] **Co-ordinator(s):** Dr.S.Parthasarathy,Prof./EEE Mr.R.Karthick,ASP/EEE **Organizing Student Chapter:** Nil **Sponsor & Amount:** Nil
Date: 30.01.2023 to 03.02.2023 (5 Days) **Type**	**5 days Professional Development Course on "**Lucrative Technology-C & C++ Programming" (Phase-II)	Mrs.G.Karthikayini, Sr.Software Trainer PROG-TEC Academy, Madurai.	**Participant Details:** Total**:40** Students:39 B.E –EEE- II Year / IV Semester "B" Sec (39/40=97.5%)

: Professional Developme nt Course			**Co-ordinator(s):** Mr.M. Jeyamurugan, AP(Sr.Gr)/EEE Dr.C.Vimalarani, ASP/EEE Dr.M.GaneshKumar i, AP(Sr.Gr)/EEE **Or ganizing Student Chapter:IEEE&II PC Sponsor & Amount:** Nil
Date: 30.01.2023 to 03.02.2023 (5 Days) **Type :** Value Added Course	**5 days Value Added Course on " Embedded Systems and Controller Applications " (Phase-II)**	**Mr.V.Selvaganesh,Director-Electrical-R&D. Mr.T.Sundrapandy, Director-IT-R&D, Shubham Solutions, Madurai.** 	**Participant Details:** Total**:40** Students:40 B.E –EEE- III Year / VI Semester "B" Sec (30 students) &IV Year (10 Students) / (40/40=100%) **Co-ordinator(s):** Dr.S.Venkatesan, Prof/ EEE Mr.A.Marimuthu, ASP/EEE Mr.R.Jeyapandiprath apAP/EEE Mr.A.Manoj,AP/EEE **Organizing Student Chapter: IEEE&IIPC Spons or & Amount:** Nil
Date: 27.01.2023 Time:1.30 pm to2.30pm **T ype: Expert Talk**	**Expert Talk on** "Energy Conservation and Audit"	Dr.S.Venkatanarayanan, Prof./EEE, K. L. N. College of Engineering,Sivagangai Dt., PCRA, Govt of India, Empanelled Faculty. 	**Participant Details:** Total**:38** Students:38 (B.E.EEE–III &II Year/VI &IV Semester 'B'sec [(2020-2024Batch)&(2021-2025Batch]) (38 / 69 = 55.1 %) **Co-ordinator(s):** Mr. M. Jeyamurugan, AP(Sr.Gr)/EEE Mr.R.Jeyapandiprath ap, AP/EEE **Organizing Student Chapter: IEEE &IIPC Sponsor & Amount:** Nil

Date: 23.01.2023 to 28.01.2023 (5 Days) **Type :** Value Added Course	**5 days Value Added Course on** "Embedded Systems and Controller Applications" (Phase-I)	Mr.V.Selvaganesh,Director-Electrical-R&D. Mr.T.Sundrapandy, Director-IT-R&D, Shubham Solutions, Madurai. 	**Participant Details:** Total**:31** Students:31 B.E –EEE- III Year / VI Semester "A" Sec (31/31=100%)) **Co-ordinator(s):** Dr.S.Venkatesan, Prof/ EEE Mr.A.Marimuthu,ASP/EEE Mr.R.Jeyapandiprathap, AP/EEE Mr.A.Manoj,AP/EEE **Organizing Student Chapter:IEEE&IIPC Sponsor & Amount:** Nil
Date: 23.01.2023 to 28.01.2023 (5 Days) **Type :** Professional Development Course	**5 days Professional Development Course on "**Lucrative Technology-C & C++ Programming**"** (Phase-I)	Mrs.G.Karthikayini, Sr. Software Trainer PROG-TEC Academy, Madurai 	**Participant Details:** Total**:34** Students:34 B.E –EEE- II Year / IV Semester "A" Sec (34/34=100%)) Mr.M. Jeyamurugan, AP(Sr.Gr)/EEE Dr.C.Vimalarani, ASP/EEE Dr.M.GaneshKumari, AP(Sr.Gr)/EEE **Organizing Student Chapter: IEEE &IIPC Sponsor & Amount:** Nil

Basic Economics of Transmission and Distribution

JOSHUA S - 212303 -IV YEAR /VIISem

Department of EEE, KLNCollege Of Engineering, Sivagangai

In most industrialized countries, electric power is provided by generating facilities, knownascentralstationgenerators,areoften located inremote areas, far fromthe point of consumption. The economics of central station generation is largely a matter of costing. As with any other production technology, centralstationgenerationentails fixed and variable costs. The fixed costs are relatively straightforward, but the variable costofpower generation is remarkablycosts of power generation.

The fixed costs of power generation are essentially capital costs and land. The capital cost of building central station generatorsvaryfromregiontoregion,largely as a function of labor costs and "regulatory costs," which include things like obtaining siting permits, environmentalapprovals, and so on. It is important to realize that building central station generation takes an enormous amount of time.

Inastate,suchasTexas,thetime-to-build can be as short as two years. In California, where bringing new energy infrastructure to fruition is much more difficult (due to higher regulatory costs), the time-to-buildcanexceedtenyears.Table5.1 showscapitalcost ranges for severalcentral-station technologies. Although the ranges in Table5.1arequitewide,theystillmaskquite a bit of uncertainty in the final cost of erecting power plants.

Operating costs for power plants include fuel, labor and maintenance costs. Unlike capital costs which are "fixed" (don't vary with the level of output), a plant's total operating cost depends on how much electricity the plant produces. The operating cost required to produce each MWh of electricenergyisreferred toasthe"marginal cost." Fuel costs dominate the total cost of operation for fossil-fired power plants. For renewables, fuel is generally free (perhaps with the exception of biomass power plants in some scenarios); and the fuel costs for nuclear power plants are actually very low. For these types of power plants, labor and maintenance costs dominate total operating costs.Further, generatorswhichrunonfossil fuels tend to have operating costs that are extremely sensitive to changes in the underlying fuel price.

DIASTERMANAGEMENT

MAHIMA VISHALI R -212304 -IV YEAR /VIISem

DepartmentofEEE,KLNCollegeOfEngineering,Sivagangai

Disaster management is the creation of plans through which communities reduce vulnerability to hazards and cope with disasters. Disaster management does not avert or eliminate the threats; instead, it focuses on creating plans to decrease the effect of disasters. Failure to create a plan could lead to human mortality, lost revenue, anddamagetoassets.CurrentlyintheUnited States 60 percent of businesses do not have emergency management plans. Events coveredbydisastermanagementincludeacts ofterrorism,industrialsabotage,fire,naturaldisasters (such as earthquakes,hurricanes, etc.), public disorder, industrial accidents, and communication failures.

RESEARCH

The Centre for Disaster Management and Public Safety aims to facilitate and enable research collaborations, projects and engagement leading to an increased understanding ofdisaster, risk and resilience trends, challenges and solutions. One of the key objectives of the research program is to use a multi-disciplinary approach to create a knowledge base that can be used to support further research activity, training and education programs.

RESEARCHPRIORITYAREAS

The Centre has identified through consultation with key stakeholders and an analysis and review of studies conducted on major disaster events, six key priority areas. These key areas reflect the research that is consideredtobecriticalinenhancingdisaster management practice and policy over the next three years.

RECENT

The recent oil spill off the Chennai coast makes this painfully obvious The Chennai oil spill which occurred after a collision between two tankers at the Kamraj Port in Ennore brings back into sharp focus India's preparation to handles disasters from its port developments. Coast Guard has repeatedly brought up the need of Local Contingency Plans (LCPs) for the proper functioning ofthe nationalplan NationalOil Spill Disaster Contingency Plan.

The National Oil Spill Disaster Contingency Plan (NOS DCP) was adopted way back in 1996. The plan has been reviewed and revised periodically to reflect international safetystandards and provisions according to the Union MinistryofShipping and Indian Coast Guard, in charge of oversight and implementation.

Disaster Risk Reduction can take place in the following ways:

1. Preparedness

This protective process embraces measures which enable governments, communities and individuals to respond rapidly to disaster situations to cope with them effectively. Preparedness includes the formulation of viable emergency plans, the development of warning systems, the maintenance of inventories and the training ofpersonnel.It mayalso embracesearchand rescue measures as well as evacuation plans for areasthat maybe at risk froma recurring disaster.Preparednessthereforeencompasses those measures taken before a disaster event which are aimed at minimizing loss of life, disruption of critical services, and damage when the disaster occurs.

2. Mitigation

Mitigation embraces measures taken to reduce both the effect of the hazard and the vulnerable conditionsto it inorderto reduce the scale of a future disaster. Therefore, mitigation activities can be focused on the hazard itself or the elements exposed to the threat. Examples of mitigation measures which are hazard specific include water managementin drought prone areas, relocating people away from the hazard prone areas and by strengthening structures to reduce damage when a hazard occurs. In addition to these physical measures, mitigation should also aim at reducing the economic and social vulnerabilities of potential disasters.

DIASTERMANAGEMENTINELECTRICAL ENGINEERING

VEL MURUGAN K -212308 IVYEAR /VII Sem

DepartmentofEEE,KLNCollegeOfEngineering,Sivagangai

Disaster management(oremergency management)isthecreationofplansthrough which communities reduce vulnerability to hazards and cope with disasters. Disaster management does not avert or eliminate the threats; instead, it focuses on creating plans to decrease the effect of disasters. Failure to create a plan could lead to human mortality, lostrevenue,anddamagetoassets.Currently in the United States 60 percent ofbusinesses do not have emergency management plans. Events covered by disaster management include acts ofterrorism, industrial sabotage,fire,natural disasters (such as earthquakes,hurricanes, etc.), public disorder, industrial accidents, and communication failures.

Emergencyplanningideals:

If possible, emergency planning should aim to prevent emergencies from occurring, and failing that, should develop a good action plantomitigatetheresults andeffectsofany emergencies.Astimegoeson,andmoredata becomesavailable,usuallythroughthestudy of emergencies as they occur, a plan should evolve.Thedevelopmentofemergencyplans is a cyclical process, common to many risk management disciplines, such as Business Continuity and Security Risk Management, as set out below:

- Recognitionor identificationofrisks
- Rankingor evaluationofrisks
- Resourcingcontrols
- ReactionPlanning
- Reporting & monitoring risk performance
- Reviewing the Risk Management framework

There are a number of guidelines and publications regarding EmergencyPlanning, published by various professional organizations such as ASIS, National Fire Protection Association (NFPA), and the International Association of Emergency Managers (IAEM). There are very few Emergency Management specific standards, and emergency management as a discipline tends to fall under business resilience standards.

Inordertoavoid,orreducesignificant losses to a business, emergency managers should work to identify and anticipate potential risks, hopefully reducing their probability of occurring. In the event that an emergency does occur, managers should have a plan prepared to mitigate the effects of that emergency, as well as to ensure Business Continuity of critical operations post-incident. It isessential for anorganizationto include procedures for determining whether an emergency situation has occurred and at what point an emergency management plan should be activated.

An emergency plan must be regularly maintained, in a structured and methodical manner,toensureitisup-to-dateintheevent of an emergency. Emergency managers generally follow a common process to anticipate, assess, prevent, prepare, respond and recover from an incident.

Pre-incidenttrainingandtesting:

Emergency management plans and procedures should include the identification of appropriately trained staff members responsible for decision-making when an emergency occurs. Training plans should include internalpeople, contractorsand civil protection partners, and should state the nature and frequencyoftraining and testing.

Testingofaplan'seffectivenessshouldoccur regularly.Ininstanceswhereseveralbusiness ororganizationsoccupythesamespace,joint emergency plans, formally agreed to by all parties, should be put into place.

Communicatingandincidentassessment:

Communication is one of the key issues during any emergency, pre-planning of communications is critical. Miscommunication can easily result in emergency events escalating unnecessarily.

Once an emergency has been identified a comprehensive assessment evaluating the levelof impact and its financialimplications shouldbeundertaken.Followingassessment, the appropriate plan or response to be activated will depend on specific pre-set criteriawithintheemergencyplan. Thesteps necessary should be prioritized to ensure critical functions are operational as soon as possible.

LocalEmergencyPlanning Committees:

Local Emergency PlanningCommittees (LEPCs)arerequiredbythe United States Environmental ProtectionAgency under the Emergency Planning andCommunity Right-to-Know Act to develop anemergencyresponseplan,reviewtheplan at least annually, and provide information about chemicals in the community to local citizens. Thisemergencypreparednesseffort focuses on hazards presented by use and storage of extremely hazardous, hazardous and toxic chemicals. Particular requirements of LEPCs include

- Identification of facilities and transportation routes of extremely hazardous substances
- Description of emergency response procedures, on and off site
- Designationofa communitycoordinator and facility emergency coordinator(s) to implement the plan
- Outline of emergency notification procedures
- Description of how to determine the probableaffectedareaandpopulationby releases
- Description of local emergency equipment and facilities and the persons responsible for them
- Outline ofevacuationplans.

BESTTRANSFORMERPROTECTION

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INTRODUCTION

This technical relies on the previously published article (6 alarms coming from a substation transformer you MUST take very seriously), but is much more dedicated to the implementation of relay protection principles. You know that transformer is one of the most important links in a transmission system.
Unfotunately, its great range of characteristics and special features makes complete protection difficult.

Practical implementation of thesix most common transformer protection principles

The choice of suitable protection for transformers also is governed by cost, as the ratings required in transmission, and distribution systems, range from a few kVA to several hundred MVA.

Fuses are used for the lower rated transformers. Higher ratings, however, require the best protection that can be designed.

The most common principles adopted in transformer protection include the following:

1. Overheatingprotection
2. Overcurrentprotection
3. Earthfaultprotection(restrictedandstandby)
4. Biaseddifferentialprotection
5. Gasdetectionprotection,and
6. Overfluxingprotection(largetransformerso rwhere a risk of over flux exists).

1. OverheatingProtection

Theratingofatransformer isbasedon the**temperature rise above an assumed maximum air temperature**. An oil temperature of about **95°C** isconsideredtobethemaximumworkingvalue beyondwhichafurtherriseof8-10°Cwillhavea detrimentaleffectonthe transformersinsulation.It willlowerthelifeofatransformer,ifsustained. Large transformershave oil and/orwinding temperature detection devices. Both **direct (oil) and indirect (winding) methods** of temperature measurementmaybeemployed,oracombinationof both

2.EarthFault(Restricted)

Generally,thesimpleovercurrentandearthfault scheme used in a typical line protection application does not give adequate protection to a star connected winding.

Thedegreeofprotectionisgreatlyimprovedby the application of a **unit differential earth fault scheme (or restricted earth fault protection)**. This is shown in Figure 2. This diagram shows a high impedance relay.

Theprotectionsystemis operativeforfaults within the zone of the current transformers. Virtually complete cover for earth faults is obtained, particularly when thestar point is solidly earthed.

3. OvercurrentProtection

Protection against excess current was the earliest evolved protection system. From this basic principle, the **graded overcurrent system** was introduced for fault protection. Mostsystemdisturbancesutilizingthismethod are detected with IDMT relays, that is, relays having:

1. **Inversecharacteristic**(thelarger thefaultcurrent,thequickeristhe operation), and
2. **Definite minimum time of operation**.Thedegreeofovercurrentprotection provided to a transformer by an IDMT relayis limited. Usually, settings oftheserelays must behigh, that is, **150% to 200%**. This is because the relaysmustnotoperateforemergencyoverload conditions.

4.GasDetection

Faults inside oil immersed electrical plant(for example, transformers) cause gas to be generated.Ifthefaultissevere,oilmovement occurs.
The generation of gas is used as a means of **faultdetectioninthegas/oiloperatedrelay**. This comprises one or two hinged vanes, buckets, or similar buoyant masses inserted intothepipeworkbetweenthe oilconservator andthetransformer tank

5. Overfluxing

Transformer overfluxing is caused by **overvoltage and/or a reduction in system frequency**. Overvoltage causes an increase in theflux generated and stress on insulation. The increasedflux densitycausesanincreaseiniron loss and an increase in magnetising current.

Fluxisdivertedfromthelaminatedcoreofthetr ansformer into the steel structure. Thisgivesrise,particularly,tothecore bolts carrying more flux
than their designed limits. Under these conditions,thecorebolts mayberapidlyheated to a temperature which destroys the insulation surrounding them.

6. DifferentialProtection

Differential protectionis designedtocover the completetransformer. This is possiblebecause of the high efficiency of transformer operation andthenearlyequalampereturnsdevelopedin the primary and secondary windings. (MVA 'in'approximatelyequalsMVA'out').

This type of protection scheme **compares current quantities flowing into the network with quantities flowing out of the network**. Thedifferencebetweenthesevaluesisreferred to as the 'spill' current available for operation oftheprotectionrelay.

7.MagnetisingCurrentInrush

When a transformer is energized initially, magnetising current is required. The current appears **only on the primary side of the transformer**, therefore, the whole of the magnetizingcurrentappearsasanimbalanceto thedifferentialprotection.

Since this phenomenon is only transient, **stability of protection may be maintained by the use ofasecond harmonic restraint**, being themostwidelyusedtopreventtheoperationof magnetizing inrush current. This is because the waveform produced by inrush currents has a significantamountofsecondharmonics.

"AnalysisofagassamplecollectedinaBuchholzchamberfrequentlyma yassistdiagnosisofthetypeoffault.Therateofgasgenerationindicate sthe severity ofthe fault."

GSM-BASEDSMARTENERGYMETERWITHARDUINOUNO

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INTRODUCTION

Smart electrical energy meter technologies have been investigated and developed for approximately 10 years. Various technologies have been developed and used to measure the electrical consumptions. For the billing, the users will get the bill from the energy board after they generated and provided using the several methods. At the moment,mostoftheresidencesinMalaysiafor exampleuse the traditional electro - mechanical watt meters and the readings are not automated. The users will have to wait the bill of energy consumptions for every month to pay their energy bill. Normally, at the end of the month, a staff from the meter board billing will visit every house to read the meter reading and at the same time, give the bill to theusers. An electricity meter or energy meter is a device that measures the amount of electric energy consumed to residence or business. There are two types of Domestic Ordinary Power Consumers meters single phase and three phases. The energy consumption is measured by allelectrical services using kilowatt- hours meter with refer to kilowatt-hours (kWh) .

Then electronicmeters was introduced with similar function with the electro-mechanical, but it replaces from analog to digital system. With this system users can note down the voltage, power readingunit, currentandthetime, dateofthe energy consumption. This system just gives someadvantages over the previous meter reading. After the electronic ones, the meter reading developed with the Bluetooth based technology which is the wireless communication and also known as Automatic MeterReading (AMR). This system is wireless and the personal computer could beused torecord thepower consumption of energy meter. The reading meter will be saved to the database and bill will be generated. The latest technology is using a Global System for Mobile Communication (GSM) based system. This system replaces the Bluetoothtechnology and the data sent using Short Message Service (SMS) to the customer and the energy board.

OVERVIEWOFTHESYSTEM

The System consists of hardware and software part. Figure 1, the hardware parts, shows the block diagram of energy meter project that the users can monitor their home current power consumptions anytime and anywhere. As for the software part, all the program located in Ardiuno UNO, using C language. Arduino UNO, as the main controller, connect energy meter, GSM module, and other sensors/peripherals so they can communicate each other. And Arduino UNO can only work after we uploaded the designed program into it.

Figure1: BlockDiagramoftheSystem

HardwareSystem

AutomaticMeterReadingsystem(AMR)continuously monitorstheenergymeterandsendsdata onrequest of the service provider through SMS. It saves hugehuman labor. The data received from an energy meter has been stored in database server, which was located at the electricity Board station through an SMS gatewayfor further processing bythe energyprovider. Automatic meter reading system helps the customer and energy service provider to access the accurate and updated data from the energymeter. AMRSystem can send energy consumption in hourly, monthly or on request. This data is sent toa central system for billing and troubleshooting. These data are stored into the database server for processing and recording. This technology mitigates labor cost, collection time,energy theft, avoids late payment. Adding to this it increases data security, improved customer service, reduced revenue losses. This system provides freedom for electricity companies to take action against lenient customers who have outstanding dues; otherwise companiescan disconnectthepower of customer.This meter use 240V AC current and count 1Wh per pulse

Figure2: Energymeterwithloadsof2lamps

In figure 2 shows the box covered the circuit, only Energy meter and LCD can be seen from the outside. Thematerial for the box is plastic PVC with A4 size and cover with stickers wallpaper. The socket was implementing as a switch between load and the energy meter. So that, 2 lamp can be used as the load.Eachlampcan giveloadfor 100Wfor 1hours.TheLCD display had been place at the top side of the meter whilebeside theLCD, theLEDindicator will blinkwhen counting1 pulse. The sensor was placed close to the LED at the Energy Meter to catch the blinking when 1 pulse. This prototypemight be different to the real product in the future. It must be well arranged without the socket close to the Energy meterand the box should be built with the proper material such as wood or Perspex transparent.

AsforGSM,Itisthesecondgenerationdigitalcellularsystem.Digitaltransmissionwasusedratherthananalog transmission in order to improve transmission quality, system capacity, and coverage area. GSM works on three frequencies 900 MHz, 1800MHz and 1900 MHz Tomake efficient useof frequency bands GSM networks uses combination of FDMA (frequencydivisionmultipleaccess)andTDMA(time divisionmultipleaccess).GSMoperatorshavesetup roaming agreement with foreign operator which help users to travelabroadandusetheircellphones.GSMmodulewas usedforreceivingSMSfromusersmobilephonethat automatically enable the controller to take further action like switching ON and OFF electrical applications such as fan, air conditioner, light and other . The system was integrated with microcontroller and GSM network interface using arduino or other microcontroller and software was utilized to accomplish the integration.

In this project, GSM module SIM900 is chosen to use. The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. Define that, GSM module which contain of SIM card and subscription with mobile operator will operate like a mobile phone. The GSM module must be connected to Arduino with TXand RX to pin 2 and 3 respectively. When switch 'ON' the module, the blue LED will be 'ON' andafter push the Button Keythered LED will be blinking. That shows the GSM in good condition, but we cannot define the line connected or not until we program the Arduino to test the GSM module.

There are other technologies beside GSM that can act as interface between the energy meters to the users, so that the users can monitor the current usage of their power consumptions. Technologies like Bluetooth and ZigBee arethe some of the them. ZigBee is a radio frequency (RF) communications standard based on IEEE 802.15.4. ZigBee isa new wireless communication technology, representing a wireless sensor network which is highly reliable, secure, low data rate, low power consumption, low cost and fast reaction. The Zigbee coordinator is responsible for creating and maintaining thenetwork. All communication between devices propagates through the coordinator to the destination device. The wireless nature of ZigBee helps overcome the intrusive installation problem with the existing systems identified earlier. The ZigBee standard theoretically provides 250kbps data rate, and as 40kbps can meet the requirements of most control systems, itis sufficient for controlling thesystem. The low installation and running cost offered by ZigBee helps tackle the expensive and complex architecture problems with existing systems.Zigbee enables broad-based deployment of wireless networks with low-cost, low-power solutions. It provides the ability to run for years on inexpensive batteries for a host of monitoring and control applications. Smart energy/smart grid, AMR (Automatic Meter Reading), lighting controls, building automation systems, tank monitoring, HVAC control, medical devices and fleet applications are just some of the many spaces where zigbee technology is making significantadvancements. Butthelimitation ofZigBeeagainst GSM is the coverage or distance area. Unlike ZigBee that has distance limitation up to hundred metres, we can find or get GSM signal in almost everywhere. This is the main consideration whyweuseGSMinsteadofZigBeetechnology. So that the users can monitor their home power consumption from anywhere as long as they have cellular (GSM) signal in their mobile phones. Different frequencies have different characteristics, low frequency tend to have better penetration of particular materials compare to high ones, with the assumption of using same power. Experiment conducted in showed the microwave capability of penetrating material of water to measure moisture content.

A microcontroller is an integrated circuit that contains processor core, memory and programmable input and output peripherals. Italsoknown assmallcomputer thatdesigned for embeddedapplications. Ontheotherhand,themicrocontroller incorporates all the features that founds in microprocessor. However, it has also added features to make a complete microcomputer system on its own. The microcontroller has built-in ROM, RAM parallel I/O, serial I/O, counters andclock circuit . The project use Arduino UNO for the microcontroller, The host processor for the arduino UNO istheAtmel Atmega328. The‘328’isthe28bit microcontroller. The architecture is based on Reduced Instruction SetComputer concept which allows the processor to complete 20 million instructions per seconds operating at 20MHz. The ATmega328 is equipped with three main memory section which is flash programmable read only memory (EEPROM), Static random access memory (SRAM) and byte-addressable EEPROMfor datastorage.TheArduinoUnoisthe‘standard’ Arduino board and themost readilyavailable. It ishave 32KB of flash memory, 2KB of SRAM and 1KB of EEPROM memory. With a total of 14 digital I/O pins and 6 analog I/O pins, this is a verycapable device, able torun most programs.

The DS1307 serial real-time-clock (RTC) is low power, full binary-coded decimal (BCD) clock / calendar plus 56 bytes. It communicatestoArduinooverI²Cconnection.Arealtime clock just act like watch, it use 3V batteryand keep time even when no current . Real time clock was used in this project to get thereal timecountingand storingthe bill in theEEPROM. With the real time clock, the bill can be reset at 1st date for every month. It used battery 3V to maintain their life even no current flow.

For light to voltage converter, the TSL257 is combination of photodiode a transimpedance amplifier on a single monolithic CMOS intergrated circuit, it is high-sensitivitylow-noise light tovoltageopticalconverter.Outputvoltageisdirectly proportional to light intensity (irradiance) on the photodiode The TSL 257 light to Voltage converter also known as sensor because itdetectthe lightand convert it to the voltage.It is used as interface energy meter to the arduino. It connected to thedigitalpinatthearduinoanddeclaresasdigitalwrite output ‘HIGH’. When the LED at energy meter blinking, this sensorwillsentthe voltage to the arduinoas apulse 1.The systemalsoaddedliquidcrystaldisplay(LCD),thedisplay unit thatused inthis projectis a16 X 2 alphanumeric LCD whichconsistof16characters and2lines.Itcanactasthe outputdisplay to show thebill,unitand GSMstatusonthe meter.

SoftwareSystem

Figure 3 shows the flowchart of the program used in the project, developed in C language with the Arduinosyntax in the Arduino IDE. The software is alsoused for loading the program code into Arduino board. In this project, the arduino IDE was used to program, create, debug and upload the coding into the microcontroller. There are parts that need to be program which aredigitalwriteinput/output, GSMnetwork, Real timeclock and EEPROM. Each program need to include the libraries of the coding such as for GSM use GSM.h or SIM900.h and other type of libraries but it depend on the coding requirement. For this project, it used libraries GSM.h, DS1307RTC.h, Wire.h, LiquidCrystal.h, and EEPROM.h

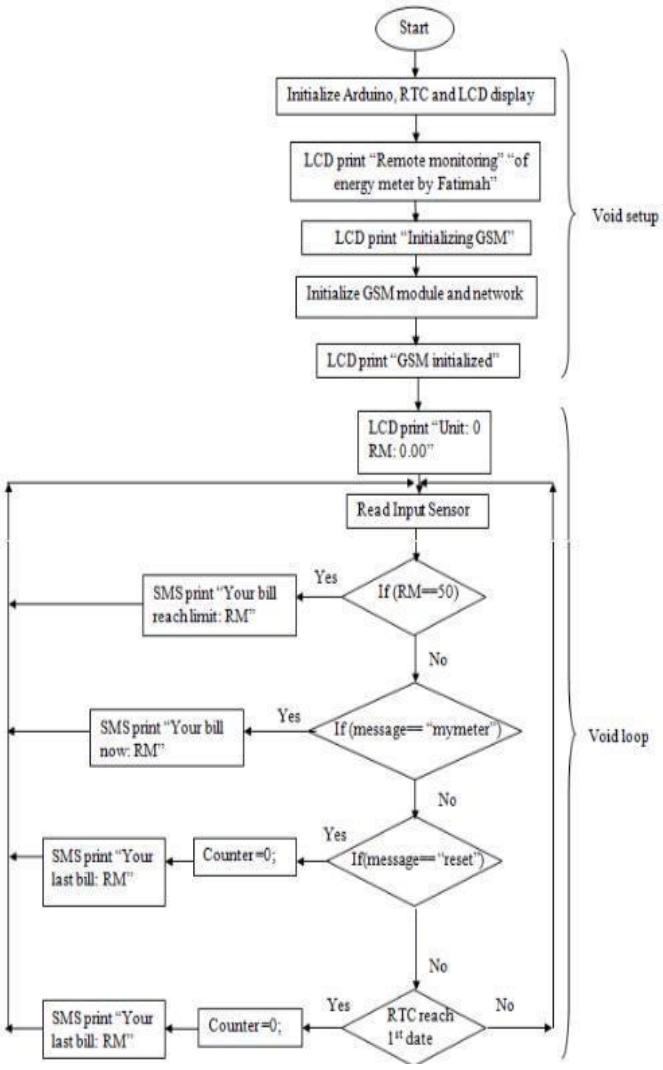

Figure3: FlowchartoftheProgram

In the RTC coding, the real time get the time from the laptop for the first time when the program uploaded, and then it will continue as normal watch until we upload the new time. For the EEPROM coding, it writes 2byte andreadback 2byte the data we write. To save the space, the EEPROM just store the bill for every 30 minutes pulse count and it can store up to 1 Kb.Thedatawillnotdeletedeventhepower breakoutbecause EEPROM isnon-volatile memory. 'Count' isthe unit of pulse for every 1Wh. Figure 4 shows the calculation of bill in 3 conditions. In this project, if the Count is less than and equalto 10, the unit will be multiple with RM 0.22 but in the real tariff for the first 200KWh must be multiple byRM0.218. For the next 100KWh the tariff is 0.334 while the net 300KWh is RM0.516. For thisproject, thetariff block and thebillrangein small scale for simplification.

```
if (Count <=10)
{
  RM = Count*0.22;
}

if ((Count >= 11)&&(Count <=20))
{
  RM = ((10*0.22)+((Count-10)*0.26));
}

if (Count >= 21)
{
                                          //GST 6%
  RM = ((10*0.22)+(10*0.26)+(((Count-20)*0.35)+0.06));
}
```

Figure4: BillCalculationFormula

The Real time clock is used as indicator to reset the bill for every month. If the time reaches to the setted time, the Count will reset tozeroand start count back thepulse.The SMS will be sent to inform the bill for that month. Another function of GSM in this project is to send SMS to users when the bill reached the limit as figure 5, or user ask a bill anytime orwhen the users wishes to reset the Count or Unit using SMS.

```
    if((RM >=50)&&(sms_sent==false))

{
sms.beginSMS(phoneNUM);
sms.print("SMS from meterEnergy: ");
sms.print(" \n You reach your limit RM :");
sms.println(RM);
sms.endSMS();
Serial.println("\nCOMPLETE!\n");
sms_sent = true;
  }
```

Thescopeor workingprincipleoftheprojectwouldbe,

- The remote monitoring of energy meter was installed at residentialhouse.
- The sensor was place close on the LED flash indicatorof KWh energymeter and Arduinocounted the pulse as 1 pulse = 1 Wh when LED blinking.
- Theuser setthelimitofenergyconsumption usingSMS for example the limit is RM50
- TheArduinocountthepulsecontinuously
- User received SMS from the Energy Meter after the energy consumption reach the limit.
- User sent "mymeter"ascommandtoaskthecurrent unit of energy consumption and the price.
- The Energy Meter replied the SMS to the user with contain of Unit and RM.
- The counter was reset to zero at the 1st date for every month and user received the last bill.
- User alsocanresetbytheir own withsendingmessage "reset" to the system when needed.

RESULTANDDISCUSSION

There are two parts that was combined to make the system. The two parts that was combined were circuit for interfacing energy meter to arduino and interface from GSM module to Arduino. Circuit operation was in good condition with the right sequence of program that uploaded into microcontroller. For the light to voltage sensor part, Arduino with microcontroller ATmega238 was used to count the input, calculatethe bill and store it into EEPROM. Real Time Clock was used to set the reset counter every month. LED indicator was blinking when input from sensor detected. The value of unit and bill price was displayat the LCD displayas set in the microcontroller. At the program, the number of mobile phone user was set to receive a message when limit reach. In GSM network, the network plan SIM card was used to transmit message to mobile phone. To combine this two part system, the GSM module Tx and Rx was connected to pin 2 and 3 respectively to Arduino while RTC used analog pin A4 andA5 at Arduino for CLOCK and RS. The other components such asLCD, LEDandlight tovoltage sensor were connected to digital port 4 to 13.

ENERGYEFFICIENTLAMPANDITS APPLICATIONS

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Electric lighting is a major energy consumer. Enormous energy savings are possible using energy efficient equipment, effective controls, and careful design. Using less electric lighting reduces heat gain, thus saving air-conditioning energy and improving thermalcomfort. Electric lighting design also strongly affects visual performanceandvisualcomfortbyaimingto maintain adequate and appropriate illumination while controlling reflection and

glare. Lighting is not just a high priority whenconsidering hotel design; it is also a high return, low-risk investment. By installing new lightingtechnologies, hotels can reduce the amount of electricity consumedandenergycostsassociatedwith lighting. There are several types of energy efficient lighting and affordable lighting technology. The following are a few examples of energy- saving opportunities with efficient lighting**.**

Installation of Compact Fluorescent Lamps (CFLs) In Place of Incandescent Lamps.

Compact Fluorescent Lamps use a different, more advanced technology than incandescent lightbulbsandcomeinarange of styles and sizes based on brand and purpose. They can replace regular, incandescentbulbsinalmostanylightfixture including globe lamps for the bathroom vanity,lampsforrecessedlighting,dimming, and 3-way functionality

lights. CFLs use about 2/3 less energy than standard incandescent bulbs, give the same amount of light, and can last 6 to 10 times longer. CFL prices range from $4 to $15 dependingonthebulb,butyousaveabout $25 to $30 per bulb on energy during the lifetime ofthe bulb. EnergyEfficient Lighting Electric lighting is a major energy consumer. Enormous energy savings are possible using energyefficient equipment,effective controls, and carefuldesign. Using lesselectric lighting reducesheatgain,thussavingair-conditioning energy and improving thermal comfort. Electric lighting design also strongly affects visual performance and visual comfort by aiming tomaintain adequate and appropriate illumination while controlling reflection and glare. Lighting is not just a highprioritywhen considering hotel design; it is also a high return, low-risk investment. Byinstalling new lighting technologies, hotels can reduce the amount of electricity consumed and energy costs associated with lighting. There are several types of energy efficient lighting and affordable lighting technology. Thefollowing are a few examples of energy- saving opportunities with efficient lighting. When looking to purchase CFLs in place of incandescent bulbs, compare the light output, or Lumens, and not the watts. Watts refers to the amount of energy used, not the amount of light. In other words, if the incandescent bulb you wish to replace is 60 Watts, this isequalto 800 Lumens. To get the same amount of light in a CFL, you should look to find a CFLthat provides 800 Lumens or more (equal to about a 13-watt fluorescent bulb). Use the table below to easily figure the conversions**.**

Installation of Energy-Efficient Fluorescent Lamps in Place Of "Conventional" Fluorescent Lamps.

Many lodging facilities may already use fluorescent lighting intheirhightrafficareas suchasthelobbyorofficearea.However,not

all fluorescent lamps are energy efficient andcost effective.

There are several types of fluorescent lamps that vary depending on theduration of their lamp life, energy efficiency, regulated power, and the qualityofcolor it transmits. There are a few styles worth noting; these models are simply labeled as "T-12", "T-8", or "T-5". The names come from the size of their diameter per eighth inch. For example, a T-12 lamp is 12/8inch in diameter (or 1 1/2 inch); a T-8lamp is8/8inchindiameter(or1inch);aT- 5 lamp is 5/8inch in diameter. This is a simple way to identify the type of fluorescent lamps your facility is using. The recommended style of fluorescent lightingisaT-8.T-8lightsarethemostcost effective. They usually cost about

$0.99 a bulb and are 30% to 40% more efficient than standard T-12 fluorescent lamps, which have poor color renditionand cause eye strain. T-8 lamps provide more illumination, better color, and don't flicker (often exhibited by standard fluorescent fixtures). T-5 lamps are the most energy efficient and also tend to transmit the best color; however, they usually cost about $5.00 per bulb. Each style of fluorescent lamp cannot function without a ballast. A ballast isan electrical deviceusedinfluorescent lampsto regulate starting and operating characteristicsofthe lamp. Some ballasts aremagnetic where as others are electronic. Electronic high frequency ballasts are now standard for mostfluorescentlights. Due to

the differences in wattage between the types of lights, if converting from a T-12 to a T-8 light,onemustalsochangethetypeofballast being used.

InstallationofOccupancy/MotionSensors to Turn Lights on And Off Where Appropriate

Lighting can be controlled by occupancy sensors to allow operation whenever someone is within the area being scanned. When motion can no longer be detected, the lightsshut off. Passive infrared sensorsreact to changes in heat, such as the pattern created by a moving person. The control must have an unobstructed view of the building area being scanned. Doors, partitions, stairways, etc. will block motion detection and reduce its effectiveness. The best applications for passive infrared occupancy sensors are open spaces with a clear view of the area being scanned. Ultrasonic sensors transmit sound above the range of human hearing andmonitor the time it takes for the sound waves to return. Abreak inthe patterncaused byany motion in the area triggers the control. Ultrasonic sensors can see aroundobstructions and are best for areas with cabinets and shelving, restrooms, and open areas requiring 360-degree coverage. Some occupancy sensors utilize both passiveinfrared and ultrasonic technology, but are usually more expensive. They can be used to control one lamp, one fixture or manyfixtures. The table below provides typical savings achievable for specific buildingareas, asdeterminedbyEPAstudies,withtheaverage savings being 60%.

Use an Automated Device, Such as A Key Tag System, To Regulate the Electric Power in A Room.

The key tag system uses a master switch at theentranceofeachguestroom,requiringthe use of a room key-card to activate them. Using this technique, only occupied rooms consume energy because most electrical appliancesareswitchedoffwhenthekeycard isremoved(whentheguestleavestheroom). Along with lighting, the heating, air conditioning, radio and television may also be connected to the master switch. This innovationhasapotentialsavingsofabout $105.00perroomperyear.

OfferNightlightstoPreventtheBathroom Lights from Being Left on All Night.

Manyguestsopttohavealightonwhilethey sleep. By turning the bathroom light on and leaving the bathroom door cracked open, guests are able to find their way through an unknown room in the middle of the night. Thosewhoareaccompaniedbychildrenmay often do the same to comfort their child. By

offering a nightlight, the energy used to power a bathroom light during the nighttime

can be avoided and guests will still be able tofeel comfortable in unfamiliar territory. One particular model uses six Light Emitting Diodes (LEDs) in the panel of a light switch to provide light for guests. LEDs arejust tinylight bulbs that fit easily into anelectrical circuit. They are different from ordinary incandescent bulbs because they don't burn out or get really hot. They are often used in digital clocks or remote controls.

MV/LV TRANSFORMERS,WHERE EVERY THING STARTS…

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ABSTRACT

The general term power supply in LV networks refers to the supply of electrical energy. The power supply, and more generally the different supplies, are provided by sources (mains supply, batteries, generator sets, etc.) which canbe MV/LV transformers, diesel generator sets, and UPSs.

This technical article will explain the most common power supply for LV networks provided by a MV/LV transformer. Don't be confused, the same transformer with or without some modifications can be used also as backup power supply, special power supply for safety services or auxiliary power supply.

Let'sseenowthethemostcommon power supply source – transformers that are used in MV/LV networks.

MV/LV transformers are generally divided into three types depending ontheirconstruction:Oil,AirinsulatedandResininsulateddry-typetransformers.

Contents:

- Oiltransformers
- Airinsulatedtransformers
- Resin insulated dry-typetransformers
- Applications
- Medium-voltagewinding
- Characteristics of MV/LVtransformers
- Primary and Secondary ConnectionConfigurations
- MV/LV transformer common
- Timeindexcouplings
- Couplinggroup

1. Oiltransformers

The magnetic circuit and the windings are immersed in a liquid dielectric that provides insulationand evacuates the heat losses of the transformer.

This liquid expands according to the load and the ambient temperature. PCBs and TCBs are now prohibited and mineral oil is generally used. It is flammable and requires protective measures against the risks of fire, explosion and pollution.

The four types of immersed transformer:

- Freebreathingtransformers,
- Gascushiontransformers,
- Transformers with expansion tank and
- Transformers with integral filling, only the latter are currently installed.

Structural standards for immersed transformers

Powerfrom50to2500kVA(25kVA possible):
Primary voltage up to 36 kV
Secondaryvoltageupto1.1kV Power > 2500 kVA:
HVvoltagegreaterthan36kV
IEC60076-1,IEC60076-2,IEC60076-3, IEC60076-4,IEC60076-5

Freebreathingtransformers

A quantity of air enters the surface of the oil and the cover allows the liquid to expand with no risk of overflowing. The transformer“breathes”, but the humidity of the air mixes with the oil and the dielectric strength deteriorates.

Gascushiontransformers

Thetankissealedandacushionofneutral gas compensates for the variation in volume of the dielectric (risk of leak).

Transformers with expansion tank

Tolimitthepreviousdisadvantages,an expansiontank limitstheair/oilcontact and absorbs the overpressure.

However the dielectric continues to oxidise and take in water. The addition of a desiccant breather limits this phenomenon but requires regular maintenance.

Transformers with integral filling

Thetankiscompletelyfilledwithliquid dielectricandhermeticallysealed.There is no risk of oxidation of the oil.

To become a high standard of excellence in Education, Training and Research in the field of Electrical & Electronics Engineering and allied applications following Ethical values and Social commitment.

To create graduates possessing excellent knowledge and skill in Electrical and Electronics Engineering fundamentals.

To provide employable graduates for industry and to do high quality research

Emphasis on Ethics, professional conduct for societal development.