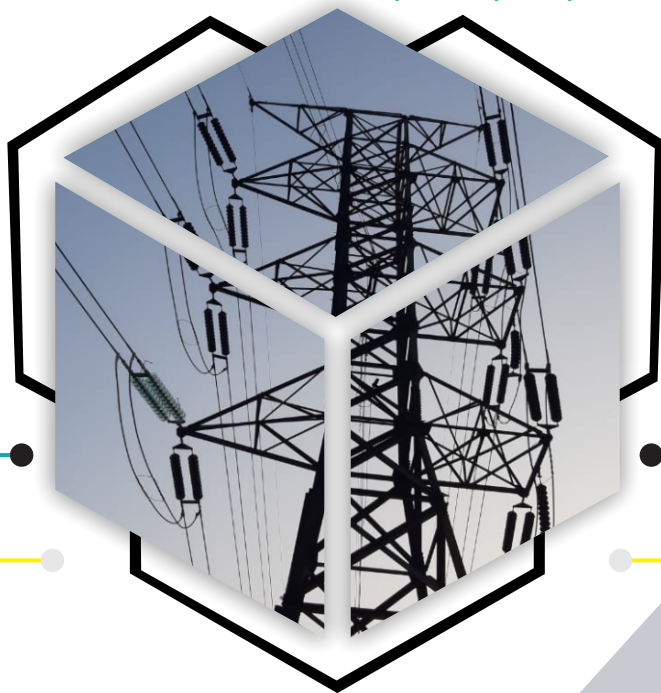




PROCEEDINGS OF THE 2ND INTERNATIONAL CONFERENCE ON HIGH VOLTAGE ENGINEERING AND POWER SYSTEMS (ICHVEPS) 2019

BALI, OCTOBER, 1st - 4th, 2019
Inna Grand Bali Beach Hotel, Sanur, Bali, Indonesia

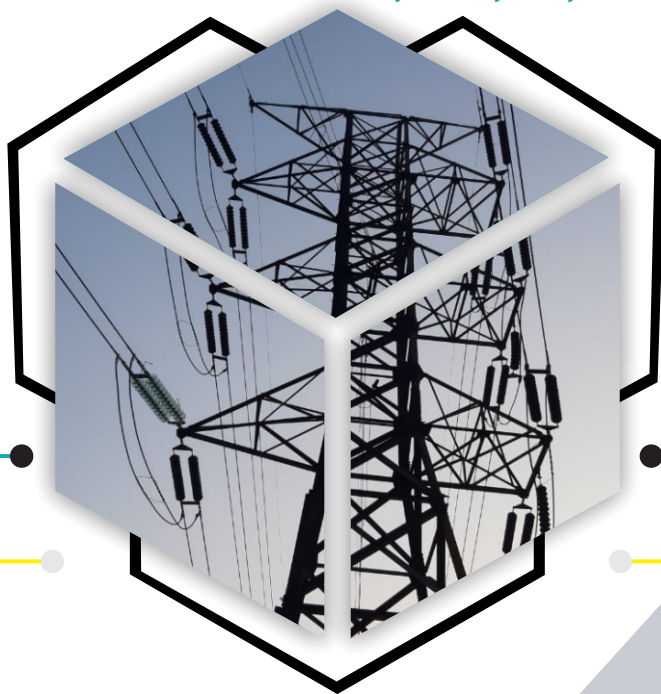


The 74th National Electricity Day 2019

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LIST OF PAPERS
THE 2ND INTERNATIONAL CONFERENCE ON HIGH VOLTAGE
ENGINEERING AND POWER SYSTEMS
(ICHVEPS) 2019

BALI, OCTOBER, 1st - 4th, 2019
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The 74th National Electricity Day 2019

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WELCOMING MESSAGES



Distinguish participants and guests, welcome to Bali, welcome to Indonesia and welcome to The International Conference on High Voltage Engineering and Power System 2019 (ICHVEPS 2019). The conference will be held in Inna Grand Bali Beach Hotel Sanur Bali, Indonesia on 1-4 October 2019. The ICHVEPS 2019 is a biannual conference organized by the School of Electrical Engineering and Informatics, Institut Teknologi Bandung (ITB), Indonesia and sponsored by IEEE Indonesia Section, IEEE Power and Energy Society Indonesia Chapter, IEEE Indonesia Student Branch and PT.

PLN (Persero). The conference is designed to be an international forum for exchange ideas, discussion and dissemination of research results and recent technologies in the field of High Voltage Engineering and Power System from power utilities, universities, research institutes as well as industries. The conference received a large number of abstracts/papers submission of more than 170. After review, finally 136 papers from 14 countries (Indonesia, Germany, Malaysia, India, Australia, South Korea, China, Japan, Taiwan, Vietnam, Canada, Italy, USA and Morocco) were accepted. The papers will be presented in 2 invited plenary sessions and 16 technical sessions. All accepted papers will be sent to IEEE Explorer (and Scopus) and selected papers will be invited to be published in International Journal on Electrical Engineering and Informatics.

I hope ICHVEPS 2019 will provide all of you a fruitful meeting, memorable experience and pleasant stay in Bali

I am looking forward to welcoming you in Bali, Indonesia.

A handwritten signature in black ink, appearing to read 'Suwarno'.

Prof.Dr.Ir. Suwarno,
General Chairman of ICHVEPS 2019

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Invitation

The 2nd International Conference on High Voltage Engineering and Power Systems 2019 (ICHVEPS 2019) will be held in Sanur-Denpasar, Bali, Indonesia on October 1-4, 2019. The Organizing Committee of ICHVEPS 2019 cordially invites you to participate in the conference.

About Bali

Bali lies between the islands of Java and Lombok and is one of more than 17,000 islands that makes up the Indonesian Archipelago. Lying just 8° south of the Equator, Bali boasts a tropical climate with just two seasons, wet and dry, a year and an average annual temperature of around 28°C.

The Balinese people have strong spiritual roots and despite the large influx of tourists over the years, their culture is still very much alive inspired by stories from the Ramayana and other Hindu epics. With a reputation as being one of the most beautiful and diverse tourist spots in the world, Bali attracts more than 4.5 million visitors a year, from all around the world.



Conference venue of ICHVEPS 2019 is Inna Grand Bali Beach Hotel. It is located on a wide stretch and white sand of Sanur beach, the most complete and competitive resort in Bali. Only 12 miles from Denpasar Ngurah Rai International Airport.

CALL FOR PAPERS



The 2nd International Conference on High Voltage Engineering and Power Systems 2019

October 1-4, 2019
Bali, Indonesia



Organized by:

Power Engineering Research Group
School of Electrical Engineering and Informatics
Institut Teknologi Bandung, Indonesia

Technically Sponsored by:

IEEE Indonesia Section
Power and Energy Society Chapter

The 2nd International Conference on High Voltage Engineering and Power Systems 2019



Language

The working language of the symposium is English. All printed matter will appear in English.



Registration Fee

	Registration Fee
IEEE Member	USD 300
Non Member	USD 350
Student	USD 250
Local Academia	IDR 2,500,000

The registration fee includes conference kit, conference proceedings, admission to all sessions, welcoming reception, banquet, lunches, and coffee breaks.

ICHVEPS 2019 SECRETARIAT

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EXHIBITION

Open call for Company Exhibition.

At the 2nd ICHVEPS 2019, we invited Power Engineering related companies to have their own company exhibitions at the venue during the three days conference. For those who are interested, please contact us at:

Email : secretary@ichveps.org

Contact Person : Lunnetta (+62-859-5666-6696)

Main topics

1. High Voltage Generation, Measurement, and Instrumentation
2. High Voltage Insulation System
3. Condition monitoring and diagnosis for power equipments and power systems
4. Dielectric materials and their aging mechanisms
5. New and environmental friendly materials for high voltage application
6. Application of high voltage in industry
7. Degradation assessment for power equipment
8. Lightning and Transient Phenomena
9. Outdoor Insulation: Insulator, Environmental Effects
10. High Voltage Insulation for UHV AC and HVDC System
11. High Voltage Apparatus: Reliability and Maintenance
12. Grounding system
13. Power Quality
14. Electromagnetic Compatibility
15. Smart Grid Technology
16. High Voltage Engineering Education
17. Power system planning, operation and control
18. Power system stability
19. FACTS
20. Renewable energy and microgrid

Abstract Submission

You are invited to submit your abstract(s) through the abstract submission system that can be reached from the conference web site. Abstract can be received by text only, no figures or graphs, with length of around 300 words. Detail of abstract submission can be seen in the conference web site

Important Dates

Abstract Submission	:	May 15, 2019
Notification	:	May 31, 2019
Full Paper Submission	:	August 1, 2019

CONFERENCE DAYS
- October 1-4, 2019 -

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		<i>Tajuddin Waris, Tomohiro Kawashima, Naohiro Hozumi, and Yoshinobu Murakami Toyohashi University of Technology, Japan</i>
TS5-2	151	Methods for Remaining Life Prediction of Power Cable based on Partial Discharge with Regard to Loading Factor Calculation and Voltage Variation
		<i>Arpan Zaeni, Umar Khayam, and Deny Viviantoro Institut Teknologi Bandung, Indonesia</i>
TS5-3	85	Leakage Currents on the Distribution Post Insulator with Different Profile Factors
		<i>Moch Dhofir, Unggul Wibawa, Rini Nur Hasanah, and Hadi Suyono Universitas Brawijaya, Indonesia</i>
TS5-4	68	Algorithms for a Multi-Sensor Partial Discharge Expert System Applied to Medium Voltage Cable Connectors
		<i>Björn Böttcher¹, Ali Sinai¹, Matthias Menge¹, Thomas Gräf¹, Ronald Plath², and Thomas Hücker¹ ¹University of Applied Sciences HTW-Berlin, Germany ²Technische Universität Berlin, Germany</i>
TS5-5	47	Temporal Transition of Partial Discharge Characteristics in XLPE Cable Joint Model Taking Account of Long-Term Operation and Deterioration
		<i>Nurcahyo Wibowo^{1,2}, Takafumi Mashimo³, Toshihiro Takahashi³, and Suwarno¹ ¹Institut Teknologi Bandung, Indonesia ²PT. PLN (Persero), Indonesia ³Central Research Institute of Electric Power Industry, Japan</i>
TS5-6	70	Multi-Physical Sensor Fusion Approach For Partial Discharge Detection On Medium Voltage Cable Connectors
		<i>Ali Sinai¹, Björn Böttcher¹, Matthias Menge¹, Thomas Gräf¹, Ronald Plath², and Thomas Hücker¹ ¹University of Applied Sciences HTW-Berlin, Germany ²Technische Universität Berlin, Germany</i>
TS5-7	38	Observation of Partial Discharge Waveform of Electrical Treeing in Epoxy Resin with Filler
		<i>Totoh Abdul Matin^{1,2,3}, Tomohiro Kawashima¹, Yoshinobu Murakami¹, Naohiro Hozumi¹, and Suwarno² ¹Toyohashi University of Technology, Japan ²Institut Teknologi Bandung, Indonesia ³PT. PLN (Persero), Indonesia</i>
TS5-8	29	Development of Real-Time Monitoring and Identification System of Aging Insulators in the Tropics
		<i>Tambi¹, Salama Manjang², Syafaruddin², and Ikhlas Kitta² ¹Halu Oleo University, Indonesia ²Hasanuddin University, Indonesia</i>
TS6-1	155	Information System Management on Asset Management in PT. PLN West Java Transmission Regional
		<i>Ira Mardya Sari and Lia Frisila PT. PLN (Persero), Indonesia</i>

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TS6-2	87	Mitigation of Communication Failures on Line Current Differential Relays by adding Automatic Function Switching Logic to Improve Protection System Reliability: Study Case in PT PLN (Persero)
		<i>Nurul Ibnu Majid, Hikmah Prasetya, and Amdi Nopriansyah</i> <i>PT. PLN (Persero), Indonesia</i>
TS6-3	98	IoT Application for On-line Monitoring of 1 kWp Photovoltaic System Based on NodeMCU ESP8266 and Android Application
		<i>Handoko Rusiana Iskandar¹, Marsudiono¹, Dede Irawan Saputra¹, Susanto Sambasri¹, Nana Heryana², Arwindra Rizqiawan², and Agus Purwadi²</i> <i>¹Universitas Jenderal Achmad Yani, Indonesia</i> <i>²Institut Teknologi Bandung, Indonesia</i>
TS6-4	59	Consideration in Communication Media Selection for Advanced Metering Infrastructure in Indonesia
		<i>Kemas M. Tofani, Kevin Gausultan M., Nur Widi Priambodo, and Buyung S. Munir</i> <i>PLN Research Institute, Indonesia</i>
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		<i>Kiswanto and Dian Agung Nugroho</i> <i>PT Telkom Indonesia, Indonesia</i>
TS6-6	4	Implementation of Multiple CAASDU IEC-104 Gateway for an Efficient SCADA Communication in PT PLN UP2D Jakarta
		<i>I Gede Nyoman Chidhi A., Eka Dharma Yanthi, and Isti Dwi Hermawati</i> <i>PT. PLN (Persero) UP2D Jakarta, Indonesia</i>
TS6-7	149	Automation Of Electricity System PLN UPDL Banjarbaru Using Passive Infrared Sensors
		<i>Soni Asmaul Fuadi and Ario Dwi Prabowo</i> <i>PT. PLN (Persero) UPDL Banjarbaru, Indonesia</i>
TS6-8	167	Design of IoT Based Monitoring System for Miniature Smart Grid
		<i>Waluyo, Febrian Hadiatna, Andre Widura, and Rangga Maulana</i> <i>Institut Teknologi Nasional, Indonesia</i>
TS7-1	172	Spacer Flashover in Humid SF ₆ under Different Electrical Stresses
		<i>A.P. Purnomoadi¹, A. Rodrigo Mor², J.J. Smit², G. Supriyadi¹, and B.S. Munir¹</i> <i>¹PLN Research Institute, Indonesia</i> <i>²Delft University of Technology, Netherland</i>
TS7-2	173	Health Index Model for Gas-Insulated Switchgear Operating in Tropical Environment
		<i>A.P. Purnomoadi¹, Gugun Bonar M.J.D¹, A. Rodrigo Mor², J.J. Smit², and B.S. Munir¹</i> <i>¹PLN Research Institute, Indonesia</i> <i>²Delft University of Technology, Netherland</i>
TS7-3	174	Risk Assessment Model for GIS Operating under Tropical Conditions
		<i>A.P. Purnomoadi¹, D.S. Rahmani¹, A. Rodrigo Mor², J.J. Smit², and G. Supriyadi¹</i> <i>¹PLN Research Institute, Indonesia</i> <i>²Delft University of Technology, Netherland</i>
TS7-4	132	The Impact of Wall Materials to Reduce Energy Costs for Air Conditioning
		<i>Marwan Marwan</i> <i>Polytechnic State of Ujung Pandang, Indonesia</i>

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		<i>Soumya Thakur and R Sarathi</i> <i>Indian Institute of Technology Madras, India</i>
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		<i>Umar Khayam and Mukhlisah Yunus</i> <i>Bandung Institute of Technology, Indonesia</i>
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TS7-8	136	Optimization of Transmission Line Design and Insulating Materials
		<i>Jeff Butler</i> <i>Hubbell Power Systems, Inc., USA</i>
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		<i>Bernardus Galih Dwi Wicaksono, Arga Iman Malakani, Dwi Handoko Arthanto, and Agus Purwadi</i> <i>Institut Teknologi Bandung, Indonesia</i>
TS8-2	23	Interconnection Study of Photovoltaic – Battery Storage Hybrid Power Plant in A Coal Mine Microgrid
		<i>Dimas Jalaluddin Ahmad¹, Dadan Nurafiat², and Nanang Hariyanto¹</i> <i>¹Institut Teknologi Bandung, Indonesia</i> <i>²PT. Tritama Mitra Lestari (TMLEnergy), Indonesia</i>
TS8-3	128	Synchronous Generator Stability Investigation in Power System with High-Penetration Photovoltaics Under Varying Solar Irradiances
		<i>Muammar Zainuddin¹, Frengki Eka Putra Surusa¹, Wayan Eka Sastra Wibawa², Syafaruddin³, and Salama Manjang³</i> <i>¹Universitas Ichsan Gorontalo, Indonesia</i> <i>²PT. PLN (Persero) UIKL Sulawesi, Indonesia</i> <i>³Universitas Hasanuddin, Indonesia</i>
TS8-4	89	Off-Grid PV System Modeling for Communal Load at Jifak Village-Asmat Regency, Papua Province Based on Matlab/Simulink
		<i>Dwi Handoko Arthanto, Arga Iman Malakani, Bernardus Galih Dwi Wicaksono, and Agus Purwadi</i> <i>Institut Teknologi Bandung, Indonesia</i>
TS8-5	157	The Requirement of Indonesian Grid Code Adaptation toward Variable Renewable Energy Penetration (case study: Solar Power Plant in Kupang Sub System)
		<i>Dhany Harmeidy Barus and Rinaldy Dalimi</i> <i>University of Indonesia, Indonesia</i>
TS8-6	161	Optimizing Unit Commitment Schemes for Variable RES Power Plant Integration in Microgrid Systems
		<i>Ignatius Rendroyoko, Ngapuli Irmea Sinisuka, and Deddy P Koesrindartoto</i> <i>Institut Teknologi Bandung, Indonesia</i>

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TS8-7	91	Study and Design of Off-Grid PV Power System in Pirien, Asmat Regency, Papua Province using MATLAB/SIMULINK
		<i>Arga Iman Malakani, Dwi Handoko Arthanto, Bernardus Galih Dwi Wicaksono, and Agus Purwadi</i> <i>Institut Teknologi Bandung, Indonesia</i>
TS8-8	31	Increasing Reliability of Coal-Fired Plant by Integrating Battery Energy Storage (Part 1: Heat Rate Side)
		<i>Aditya Eka Purba Sejati and Nanang Hariyanto</i> <i>Institut Teknologi Bandung, Indonesia</i>
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		<i>Neris Peri Ardiansyah and Umar Khayam</i> <i>Institut Teknologi Bandung, Indonesia</i>
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		<i>Salama Manjang, Ikhlas Kitta, and Abdi Ikhlas</i> <i>Hasanuddin University, Indonesia</i>
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		<i>Harry Gumilang</i> <i>PT. PLN (Persero), Indonesia</i>
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		<i>Bayu Hadi Nugraha¹, Tobias Kinkeldey², Tobias Münster², Peter Werle², and Suwarno³</i> ¹ <i>PT. PLN (Persero), Indonesia</i> ² <i>Leibniz University Hannover, Germany</i> ³ <i>Institut Teknologi Bandung, Indonesia</i>
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		<i>Yulia Erina Sari, Tjokorda Istri Diah Karisma Dewi, and Suwarno</i> <i>Institut Teknologi Bandung, Indonesia</i>
TS9-6	46	Determination of Acidity in Accelerated Aged Insulating Paper, Impregnated with Different Insulating Oil
		<i>Wind Adiati^{1,2}, Peter Werle³, Tobias Kinkeldey³, and Suwarno¹</i> ¹ <i>Institut Teknologi Bandung, Indonesia</i> ² <i>PT. PLN (Persero), Indonesia</i> ³ <i>Leibniz University Hannover, Germany</i>
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		<i>Yuda Muhammad Hamdani and Umar Khayam</i> <i>Institut Teknologi Bandung, Indonesia</i>
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		<i>A. Rajab, A. Hanalde, Andi Pawawoi</i> <i>Andalas University, Indonesia</i>
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		<i>Dedi Roicandra Sihombing, Yokeu Wibisana, and Master Jan Roy Turnip</i> <i>PT. PLN (Persero) UIT JBT, Indonesia</i>

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		<i>Nur Al Anshari Munir, Yogasmana Al Mustafa, and Fransileo Siagian PT. PLN (Persero), Indonesia</i>
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		<i>Yokeu Wibisana, Master Jan Roy Turnip, and Dedi Roi Candra Sihombing PT. PLN (Persero) UIT JBT, Indonesia</i>
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		<i>Sinanuri Surawijaya, Rahman Azis Prasajo, Winanda Riga Tamma, I Gusti Ngurah Mahendrayana, and Suwarno Institut Teknologi Bandung, Indonesia</i>
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		<i>Rahman Azis Prasajo, Achmad Setiawan, Suwarno, Nur Ulfa Maulidevi, and Bambang Anggoro Soedjarno Institut Teknologi Bandung, Indonesia</i>
TS10-7	40	Power Transformer Degradation Condition and Insulation Index Estimation Based on Historical Oil Data
		<i>Muhammad Fuad Al Hamdani¹, Rahman Azis Prasajo², Suwarno Suwarno², and A. Abu-Siada³ ¹PT. PLN (Persero), Indonesia ²Institut Teknologi Bandung, Indonesia ³Curtin University, Australia</i>
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		<i>Lutfhi Lukman Hakim, I Gede Arka Prawira Putra, I Made Yulistya Negara, I Gusti Ngurah Satriyadi Hernanda, Dimas Anton Asfani, and Daniar Fahmi Institut Teknologi Sepuluh Nopember, Indonesia</i>
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		<i>Dhruba Kumar and Partha Sarathee Bhowmik National Institute of Technology Durgapur, India</i>
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		<i>Wayan Eka Sastra Wibawa¹, Muammar Zainuddin², Steven Humena², Syafaruddin³, and Salama Manjang³ ¹PT. PLN (Persero) UIKL Sulawesi, Indonesia ²Universitas Ichsan Gorontalo, Indonesia ³Universitas Hasanuddin, Indonesia</i>
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		<i>Duy C. Huynh¹, Thanh H. Truong¹, Anh V. Truong², and Matthew W. Dunnigan³</i>
		<i>¹Ho Chi Minh City University of Technology, Vietnam</i>
		<i>²Ho Chi Minh City University of Technology and Education, Vietnam</i>
		<i>³Heriot-Watt University, United Kingdom</i>
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		<i>Reza Widya Hutama</i>
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		<i>Alfi Yulianta</i>
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		<i>Chur Hee Lee¹ and Seung Wan Kim²</i>
		<i>¹KEPRI, Korea</i>
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		<i>Muhammad Fadli Nasution, Fajli Mustafa, and Shaga Shaulgara</i>
		<i>PT. PLN (Persero) UIT JBB, Indonesia</i>
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		<i>Chih-Chiang Hua and Cheng-Hao Hsiao</i>
		<i>National Yunlin University of Science and Technology, Taiwan, R.O.C.</i>
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		<i>Institut Teknologi Bandung, Indonesia</i>
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		<i>National Yunlin University of Science and Technology, Taiwan, R.O.C.</i>
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		<i>Cekmas Cekdin¹, Zainuddin Nawawi², and Muhammad Faizal²</i>
		<i>¹Muhammadiyah University, Indonesia</i>
		<i>²Sriwijaya University, Indonesia</i>
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		<i>Bintang Antares, Faris H. Makarim, Sofyan M. Ilman, Arwindra Rizqiawan, and Pekik A. Dahono</i>
		<i>Bandung Institute of Technology, Indonesia</i>

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		<i>Chuangyang Li¹, Bo Liu², Jiancheng Wang², Ruilei Gong², Guan Wang³, Zhipeng Lei¹, Davide Fabiani¹, Chuanjie Lin⁴, and Jun Hu⁴</i> <i>¹University of Bologna, Italy</i> <i>²Shandong Taikai High Voltage Switchgear Co., Ltd., China</i> <i>³Tai'an Sheng Yuan Powder Co., Ltd., China</i> <i>⁴Tsinghua University, China</i>
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		<i>Mochammad Wahyudi¹, Tumiran¹, I Made Yulistya Negara², Noor Akhmad Setiawan¹, and Bambang Sugiyantoro¹</i> <i>¹Universitas Gadjah Mada, Indonesia</i> <i>²Institut Teknologi Sepuluh Nopember, Indonesia</i>
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		<i>Rai Naveed Arshad¹, Zolkafle Buntat¹, M.A.B. Sidik², Arbab Alamgir³, Z. Nawawi², and Mohd. Hafizi¹</i> <i>¹UTM, Malaysia</i> <i>²Universitas Sriwijaya, Indonesia</i> <i>³University Technology Malaysia, Malaysia</i>
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		<i>Muhammad Muslih Mafruddin^{1,2}, Suwarno², and A. Abu-Siada³</i> <i>¹PT. PLN (Persero), Indonesia</i> <i>²Institut Teknologi Bandung, Indonesia</i> <i>³Curtin University, Australia</i>
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		<i>Yudi Saputra^{1,2}, Myungchin Kim³, Suwarno¹, Youngtaek Jeon³, and Younghun Byeon³</i> <i>¹Bandung Institute of Technology, Indonesia</i> <i>²PT. PLN(Persero), Indonesia</i> <i>³Chungbuk National University, Republic of Korea</i>

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		<i>Bryan Denov, Ilham Hendratama, and Reynaldo Zoro</i> <i>Institute of Technology Bandung, Indonesia</i>
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		<i>Yuli Astriani¹, GM Shafiullah², and Farhad Shahnai²</i> <i>¹BPPT, Indonesia</i> <i>²Murdoch University, Australia</i>
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		<i>Giri Angga Setia¹, Gibson HM Sianipar², Kuku Samudra², Fauzia Haz¹, Naftalin Winanti¹, Handoko R Iskandar¹</i> <i>¹University of Jenderal Achmad Yani, Indonesia</i> <i>²Institute of Technology Bandung, Indonesia</i>
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		<i>Duy C. Huynh¹, Nam V. Pham¹, and Matthew W. Dunnigan²</i> <i>¹Ho Chi Minh City University of Technology, Vietnam</i> <i>²Heriot-Watt University, United Kingdom</i>

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		<i>Fauzia Haz¹, Giri Angga Setia¹, Handoko Rusiana Iskandar¹, Sri Mawar Said², and Yusran²</i> ¹ University of Jenderal Achmad Yani, Indonesia ² Universitas Hasanuddin, Indonesia
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		<i>Ignatius Rendroyoko, Ngapuli I Sinisuka, and Deddy P Koesrindartoto</i> Institute Technology of Bandung, Indonesia
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		<i>Arunachalam Natarajan</i> CSL Silicones Inc. Canada, Canada
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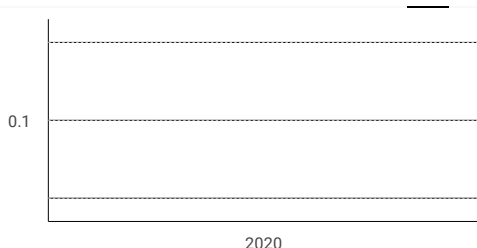
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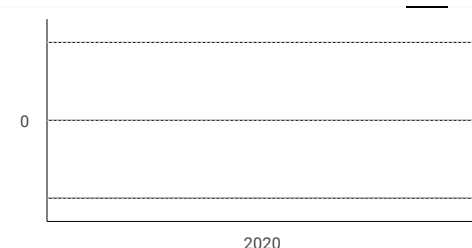
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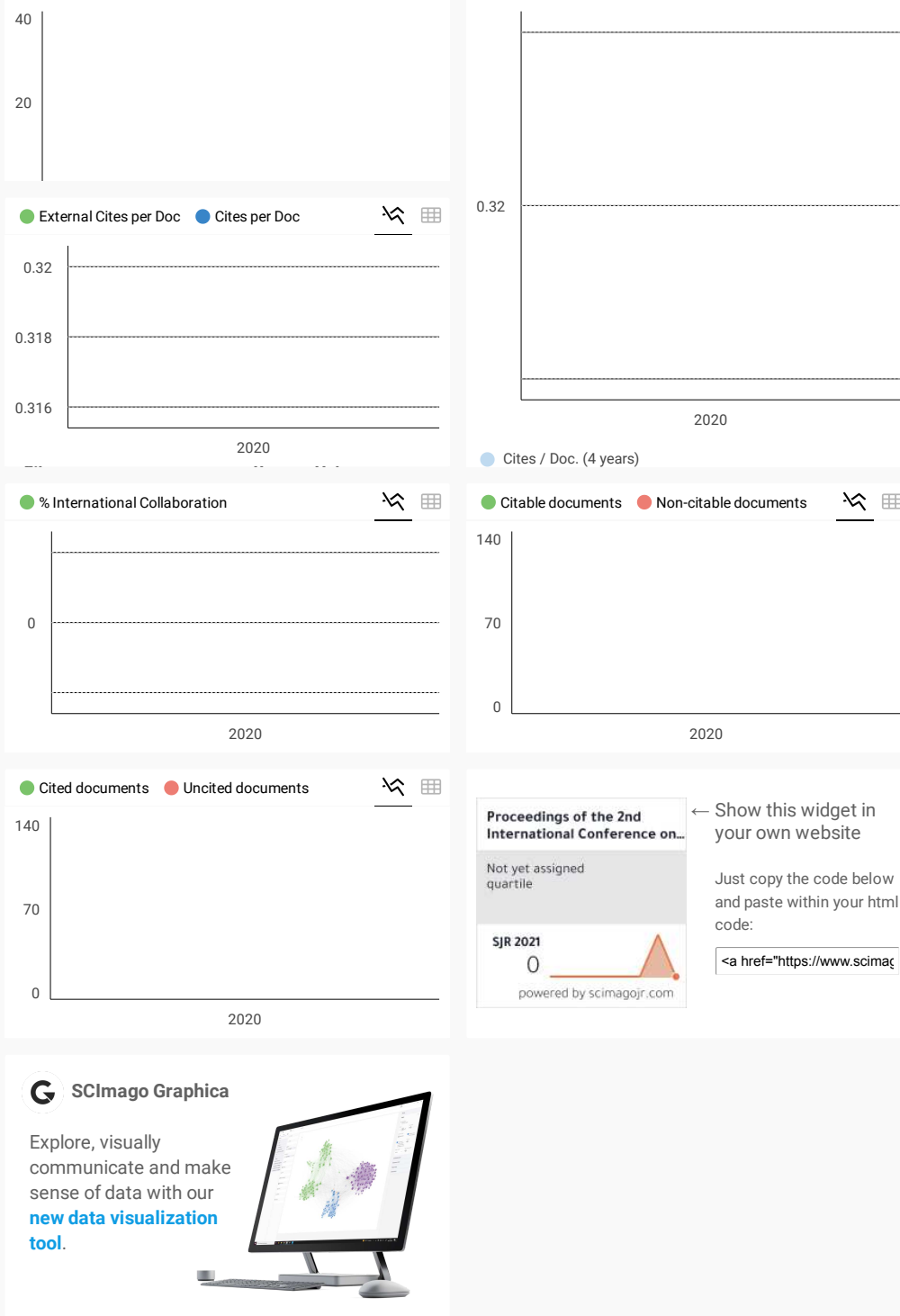


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I. Introduction
Electric energy consumption continues to grow to be more complicated, along with demand. Therefore, it is necessary to have smart grids. Renewable energy sources, wind and PV (photovoltaics), allow penetration into smart grids and require supporting equipment [1]-[3]. Smart grid makes it possible to meet energy demand, increase reliability, quality, efficiency and integrate renewable energy sources [4], towards energy independence and economic growth [5]. Customers can consume, produce, and save energy [6]. The development of smart grids requires adequate management [7], the integration of energy sources and loads [8], and the penetration of renewable energy generation requires modifying the network structure [9]. The concept of smart grids, including hybrid PV / WT (wind turbines), can overcome the issue of global warming [10]-[12]. Generally, it focuses on the design of PV-grids [13]. Internet of Things (IoT), for monitoring and controlling PV on smart grids, improves

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Design of IoT Based Monitoring System for Miniature Smart Grid

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Abstract—This paper presents a preliminary design of IoT based monitoring system for miniature smart grid. In this case, the smart grid is the interconnection of electric sources between a solar panel and the 220 V PLN network. The main components of the monitoring and controlling system consisted of relays, inverters, charge controller, and measuring instrument. The results showed that the measured voltages between 202.8 up to 210.6 volts. Moreover, the electric current, power, and energy were also appropriately recorded.

Keywords—IoT, monitoring, relays, smart grid, solar panel

I. INTRODUCTION

Electric energy consumption continues to grow to be more complicated, along with demand. Therefore, it is necessary to have smart grids. Renewable energy sources, wind and PV (photovoltaics), allow penetration into smart grids and require supporting equipment [1-3]. Smart grid makes it possible to meet energy demand, increase reliability, quality, efficiency and integrate renewable energy sources [4], towards energy independence and economic growth [5]. Customers can consume, produce, and save energy [6]. The development of smart grids requires adequate management [7]. A microgrid is characterized by the integration of energy sources and loads [8], and the penetration of renewable energy generation requires modifying the network structure [9]. The concept of smart grids, including hybrid PV / WT (wind turbines), can overcome the issue of global warming [10-12]. Generally, it focuses on the design of PV-grids [13]. Internet of Things (IoT), for monitoring and controlling PV on smart grids, improves the performance of electricity supply [14-16]. Renewable energy generation is a challenge to smart grids so that the right information and communication technology (ICT) is needed [17].

Thus, the smart grid system and technology are essential for saving and sustaining electricity supply, by involving renewable energy, as well as monitoring and controlling with automation systems, ICTs, and IoT. The objective of the research, at this moment, is to design the monitoring system based on IoT for miniature smart grid. The urgency of this research is very useful for the integration and saving of electricity consumption, involving renewable energy sources.

II. DESIGN METHOD

Fig. 1 shows the main necessary components used for the design of the monitoring system. The components consisted of (a) Arduino nano, MPPT solar charge

controller, off-grid inverter, panel box, solar panel, Raspberry Pi 3+, relay, and wattmeter.

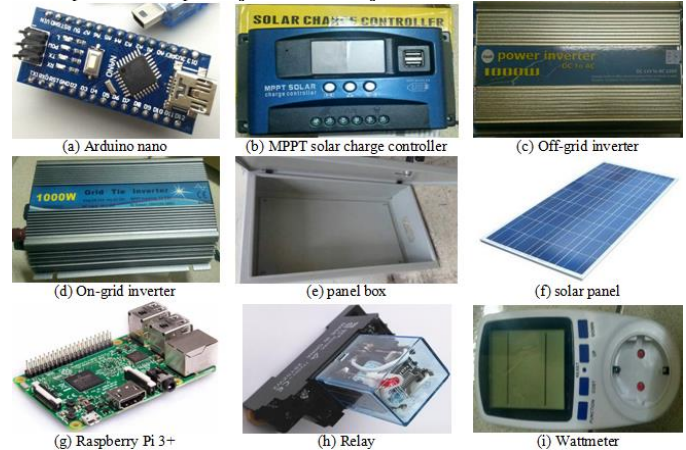


Fig. 1. A necessary component for IoT based monitoring system

While Fig. 2 shows the schematic diagram of the general system design.

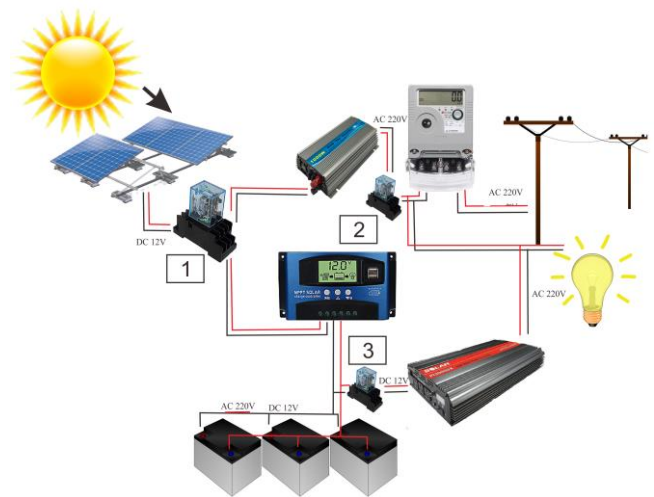


Fig. 2. The schematic hybrid solar power generation system

The hybrid system of solar power plant operates on-grid and consists of several components, including batteries. In this system, there are three relays. The relay 1 served as a determinant of whether the system would operate on-grid or off-grid by observing two parameters, namely the supply from the grid, and also the condition of the battery. If there was supply from the network and the battery was fully charged, the solar panel supply would be directly forwarded to the grid. Otherwise, if the battery were not charged or empty, the relay 1 would prioritize the supply from the solar

panel to fully charge the battery. When the battery was full, the charge controller would give a signal to the relay 1 which would then cut off the supply to the battery. The supply from the solar panel would be directly forwarded to the grid.

The relay 2 functioned to disconnect and connect the supply from the solar panel while providing a signal to the relay 1. If it were detected not any current from the grid, the relay would cut off the supply from the solar panel to the grid. If the current was detected from the grid, the supply from the inverter would be forwarded to the grid. The relay 3 functioned to disconnect or connect the supply from the battery to the load. The relay 3 worked based on the signal given from the relay 2. If the relay 2 detected that there was not any supply from the grid, the relay 3 would get a message to connect the batteries to the load. While, if the relay 2 detected that there was any supply from the grid, the relay 3 would get a signal to disconnect the batteries from the connected load.

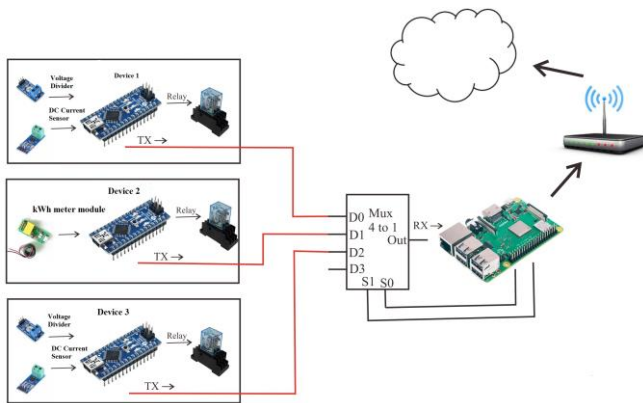


Fig. 3. Controller diagram block

Fig. 3 shows the block diagram of the controller that governed system work. The device 1 consisted of a current sensor, voltage sensor, relay, and microcontroller. These devices functioned as a regulator of the supply of solar panels, which would be forwarded to the grid, or to the battery depending on the parameter set. The device 2 consisted of kWh meter module, relay, and microcontroller. This device functioned to connect and disconnect the grid with the on-grid inverter supplied by the solar panel by detecting the current from the grid or not. Finally, device 3 consisted of the current sensor, voltage sensor, relay and microcontroller. This device functioned to connect and disconnect the supply of the batteries for the load. All of these devices are connected to one central controller, namely Raspberry PI so that each device could communicate with each other. The central controller could receive data from each connected device and could send it to the cloud where the data would be accessible via a computer or smartphone.

III. RESULTS AND DISCUSSION

At this moment, the power system was loaded by an 8-watt lamp. The loading was to prove the monitoring system operated adequately.



Fig. 4. Display monitoring system data on the cloud

Fig. 4 shows the display of monitoring system data through the cloud, which functions to monitor parameters such as voltage, current, power, and energy both in real-time and at certain time intervals. While Table 1 lists an example of the test results on the system. This table consisted of identity number, voltage, current, power, energy, and created time parameters.

Table 1. Example of test results on the system

ITNAS - ELECTRONIC LABORATORY					
REPORTING DATE 22-07-2019 to 22-07-2019					
ID	VOLT (V)	CURRENT (A)	POWER (W)	ENERGY (kWh)	CREATED (DateTime)
1	202,8	0,07	8	29	22/07/2019 14:27:51
2	204,5	0,07	8	29	22/07/2019 14:27:54
3	204,5	0,07	8	29	22/07/2019 14:27:56
4	204,1	0,07	8	29	22/07/2019 14:27:59
5	204,1	0,07	7	29	22/07/2019 14:28:01
6	204,3	0,07	8	29	22/07/2019 14:28:18
7	204,5	0,07	8	29	22/07/2019 14:28:21
8	206,5	0,07	8	29	22/07/2019 14:30:41
9	205,8	0,07	8	30	22/07/2019 14:35:12
10	205,8	0,07	7	30	22/07/2019 14:35:15

Fig. 5 shows the sample of voltage chart that recorded. Generally, the values range between 202.8 up to 210.6 volts. These voltage values gave an average of 207.9 volts and the standard deviation of 0.99. Thus, voltage monitoring ran properly.

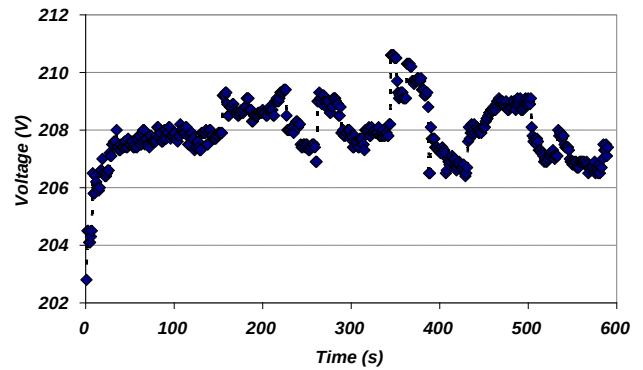


Fig. 5. Voltage chart

Fig. 6 shows the results of current monitoring chart. Generally, the monitored current values were reasonably constant. Nevertheless, at second of 407, the load of the lamp was disconnected, so that the current would be zero. Before it was zero, the current would be transient.

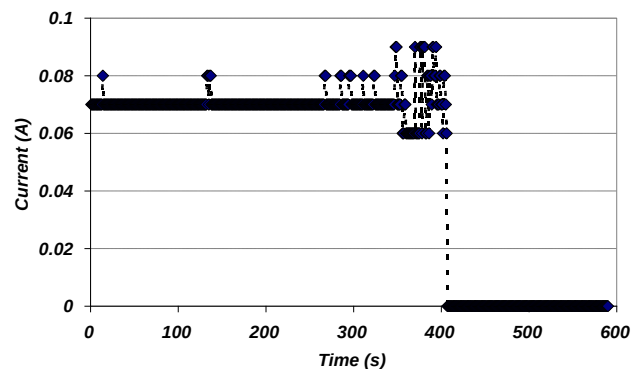


Fig. 6. Current chart

Fig. 7 shows the results of power monitoring chart. Due to power is voltage times current, so that the power behavior is similar to the current. The load of the lamp was

disconnected at second of 407 so that the power would be zero too. Before it was zero, the power would also be transient.

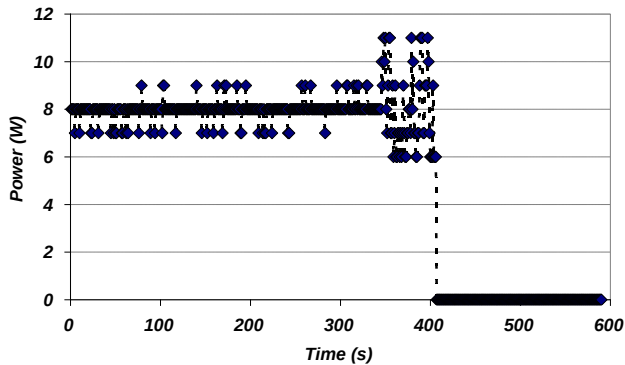


Fig. 7. Power chart

Fig. 8 shows the results of the energy monitoring chart. The electric energy is power accumulation to the time of the second. Therefore, starting at the second of 407, so that the consumed energy was constant, due to the consumed power was zero.

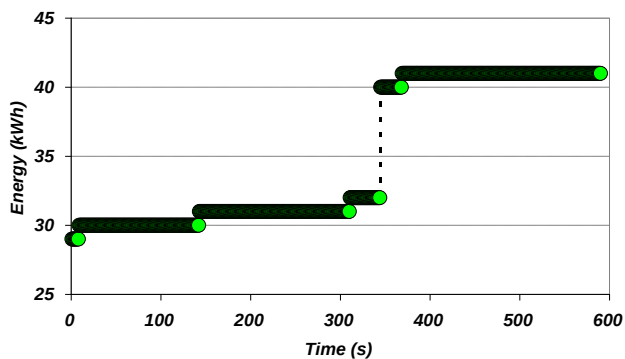


Fig. 8. Energy chart

IV. CONCLUSIONS

The monitoring and controlling system consisted of relays, inverters, charge controller, and measuring instrument, as main components. The voltage measurements showed the results between 202.8 up to 210.6 volts, with the average and standard deviation of 207.9 volt and 0.99, respectively. While, the remaining recordings, such as electric current, power, and energy, also operated adequately, both for the loading and unloading conditions.

ACKNOWLEDGMENT

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REFERENCES

- [1] Blaabjerg, F., Guerrero, J.M., Smart Grid and Renewable Energy Systems, Proceedings of the International Conference on Electrical Machines and Systems, ICEMS 2011.
- [2] Koenigs, C., Suri, M., Kreiter, A., Elling, C., Eagles, J., Peterson, T.R., Stephens, J.C., Wilson, E.J., A Smarter Grid for Renewable Energy: Different States of Action, Challenges 2013, 4, 217-233.
- [3] Mekkaoui, A., Laouer, M., Mimoun, Y., Modeling and simulation for smart grid integration of solar/wind energy, Leonardo Journal of Sciences, ISSN 1583-0233, Issue 30, Jan.-Jun. 2017, p. 31-46.
- [4] Intel, A Digital Energy Network: The Internet of Things & the Smart Grid, Smart Grid, White Paper, Intel, 2014.
- [5] Vijayapriya, T., Kothari, D.P., Smart Grid: An Overview, Smart Grid, and Renewable Energy, Scientific Research, 2011, 2, 305-311.
- [6] Lee, E. K., Advancing Building Energy Management System to Enable Smart Grid Interoperation, International Journal of Distributed Sensor Networks, Hindawi Publishing Corporation, Vol. 2016, Article ID 3295346, Jan. 17, 2016, 12 pages.
- [7] Trefke, J., González, J.M., D'aneke, C., Chapter 3 IEC/PAS 62559-Based Use Case Management for Smart Grids, M. Uslar et al.: Standardization in Smart Grids, POWSYS, Springer-Verlag Berlin Heidelberg, 2013, pp.39-57.
- [8] Lee, E.K., Shi, W., Gadhi, R., Kim, W., Design, and Implementation of a Microgrid Energy Management System, Sustainability 2016, 8, 1143, pp.1-19.
- [9] Ali, A., Li, W., Hussain, R., He, X., Williams, B.W., Memon, A.H., Overview of Current Microgrid Policies, Incentives and Barriers in the European Union, the United States and China, Sustainability 2017, 9, 1146, pp.1-28.
- [10] Raut, M.M., Sable, R.R. Toraskar, S.R., Internet of Things(IoT) Based Smart Grid, International Journal of Engineering Trends and Technology (IJETT), Vol. 34, No. 1, April 2016, ISSN 2231-5381, pp.15-20.
- [11] Camacho, E.F., Samad, T., Sanz, M.G., Hiskens, I., Control for Renewable Energy and Smart Grids, The Impact of Control Technology, 2011.
- [12] Natsheh, E.M., Albarbar, A., Yazdani, J., Modeling, and control for smart grid integration of solar/wind energy conversion system, 2011 2nd IEEE PES International Conference and Exhibition on Innovative Smart Grid Technologies, Manchester, UK, 5-7 Dec. 2011.
- [13] Massawe, H.B., Norum, L.E., Grid Connected PV Systems with Smart Grid functionality, Master of Science in Electric Power Engineering, Norwegian University of Science and Technology, Dept. of Electric Power Engineering, June 2013.
- [14] Shrihariprasath, B., Rathinasabapathy, V., Design and Implementation of Solar PV Smart Grid System Using IoT and M2M Integrated 6LoWPAN Wireless Sensor Network, International Conference on Advances in Information Technology and Networking, Feb. 2017.
- [15] Foleya, A., Connolly, D., Leahya, P., Mathiesend, B.V., Lunde, H., Leahy, M., McKeogha, E., Electrical Energy Storage & Smart Grid Technologies to Integrate the next generation of Renewable Power Systems, SEEP2010, Conference Proceedings, June 29th-July 2d, 2010, Bari, Italy.
- [16] Habault, G., Lefrançois, M., Lemerrier, F., Montavont, N., Chatzimisios, P., Papadopoulos, G.Z., Monitoring Traffic Optimization in Smart Grid, IEEE Transactions on Industrial Informatics, Jan. 2017, pp.1-9.
- [17] Wang, Q., Granelli, F., Devetsikiotis, M., Renewable Energy, and the Smart Grid: Architecture Modeling, Communication Technologies, and Electric Vehicles Integration, Ph.D. Dissertation, International Doctorate School in Information and Communication Technologies, DISI - University of Trento, April 2015.

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ICHVEPS 2019

1-4 October 2019

Inna Grand Bali Beach, Bali, Indonesia

Bandung, August 4th, 2019

Dear Author(s),

It is our pleasure to inform you that your submission,

Number : 167

Title : Design of IoT Based Monitoring System for Miniature Smart Grid

Author (s) : Waluyo, Febrian Hadiana, Andre Widura, and Rangga Maulana
has been accepted for paper presentation at ICHVEPS 2019.

You are invited to present your paper in the 2nd International Conference on High Voltage Engineering and Power Systems 2019, on October 1-4, 2019, at Grand Bali Beach Hotel, Denpasar, Bali, Indonesia.

We look forward to seeing you in the conference.

Sincerely,



Dr. Umar Khayam

General Secretary of ICHVEPS2019



Towards sustainable and reliable power delivery
The 74th National Electricity Day 2019

CERTIFICATE

OF PARTICIPATION

THIS CERTIFICATE IS PROUDLY PRESENTED TO

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Engineering and Power Systems 2019***

*that has been held on October 1st - 4th, 2019
at Inna Grand Bali Beach, Sanur, Bali, Indonesia*



Prof. Dr. Ir. Suwarno, MT, IPU
General Chair, ICHVEPS 2019