ANNA UNIVERSITY
CHENNAI – 25

Procs.No.847/RUSA/PD3/2013 **Date. 20 .04.2021**

Sub: Anna University – RUSA 2.0 Project – ""Electric Vehicle Technologies – Smart material characterization, manufacturing and grid management" – Thematic Title "Monitoring and Analysis of Power Quality Issues on to the Distribution Network Due to Electric Vehicle Infrastructure" by Dr. C. Sharmeela - Revalidated Sanction for the year 2021-22 – Accorded.

Ref: 1. G.O.No.(Ms).139 Higher Education (A1) Dept., dated:12.10.2020.
2.Minutes of PMU Meeting held on 11-12-2020 as approved by the Vice Chancellor.
3. This office Procs.No.847/RUSA/PD3/2013 dated 11.02.2021.
4. Lr. dated 12.04.2021 from the Professor and Head, Department of Electrical and Electronics Engineering.

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In the reference 3rd cited, administrative sanction was accorded for a sum of Rs.1,17,48,750/- to the Professor and Head, Department of Electrical and Electronics Engineering towards the implementation of the research project entitled "Monitoring and Analysis of Power Quality Issues on to the Distribution Network Due to Electric Vehicle Infrastructure" as detailed in the **Annexure**.

The above said project is for the period of two years from 04-12-2020 to 03-12-2022. This is a joint project with 14 Team Coordinators with 14 different thematic areas.

One of the 14 thematic areas is "Monitoring and Analysis of Power Quality Issues on to the Distribution Network Due to Electric Vehicle Infrastructure" with following Team Coordinator and Team Members.

Team Co-ordinator : Dr. C. Sharmeela, Associate Professor, Dept. of EEE.

Team Members : 1. Dr. B. Umamaheswari, Professor, Dept. of EEE.
2. Dr. P.Vanaja Ranjan, Professor, Dept. of EEE.
3. Dr.M.R.Swaminathan, Associate Professor, Dept. of Mechanical Engg.
4. Dr.M.Vijayalaxmi, Assistant Professor, Dept. of EEE.

In the reference 4th cited, the Professor and Head, Department of Electrical and Electronics Engineering has requested to issue revalidation sanction for the year 2021-22 towards the above said research project.

Accordingly, revalidated sanction for the year 2021-22 is hereby accorded for a sum of Rs.1,17,48,750/- (Rupees One Crore Seventeen lakhs Forty Eight Thousand and Seven Hundred and fifty only) to the Professor and Head, Department of Electrical and Electronics Engineering towards the implementation of the research project entitled "Monitoring and Analysis of Power Quality Issues on to the Distribution Network Due to Electric Vehicle Infrastructure" as detailed in the **Annexure**.

The Team Coordinator is requested to conduct the recruitment process as per the guidelines given by P&D office, follow the purchase procedure of Anna University strictly, to obtain permission from the higher authorities if any required and submit the monthly report on or before 10th of every month to P&D office through the concerned Group Coordinator.

No foreign travel is allowed without specific permission from the funding agency.

The expenditure in this regard is debitable under the head of account "**M.H.No.7.1.10.37 – RUSA 2.0 – (c) Research and Innovation**".

Necessary entries have been made in the Sanction Register vide Sl.No.8 at Pg.No.4 of 2021-22.

20/04/21.

REGISTRAR

20/04/21

To

The Professor & Head,
Dept. of Electrical and Electronics Engineering,
Anna University, Chennai – 25.

Copy to:

1. Bill
2. The Group Coordinator (HoD, Dept. of EEE.)
3. Dr. C. Sharmeela, Associate Professor, Dept. of EEE.
4. Dr. B. Umamaheswari, Professor, Dept. of EEE.
5. Dr. P.Vanaja Ranjan, Professor, Dept. of EEE.
6. Dr. M.R.Swaminathan, Associate Professor, Dept. of Mechanical Engg.
7. Dr. M.Vijayalaxmi, Assistant Professor, Dept. of EEE.
8. The RUSA Coordinator
9. The Deputy Registrar (Finance), Anna University.
10. The Superintendent, FA 50 Section.

ANNEXURE

Thematic Area 7: MONITORING AND ANALYSIS OF POWER QUALITY ISSUES ON TO THE DISTRIBUTION NETWORK DUE TO ELECTRIC VEHICLE INFRASTRUCTURE

Team Coordinator - Dr. C. Sharmeela

S.No.	Component	Head	Recommended Items on which expenditure can be made in the 1st Installment	Amount (INR)
1.	Hard	**Equipment (S.No.1)**	**1. Power Quality Analyzer** • Power Quality Monitoring in Compliance with IEC 61000-4-30 class-A: Ed. 3 (2015) & IEEE 1159:2009 or better. • Power Monitoring in Compliance with IEEE 1459:2000 or better • Harmonics Monitoring in Compliance with IEC 61000-4-7 Class 1: Edition 2 (2008) & IEEE 519:2014 or better • Voltage Testing in Compliance with EN 50160:2010 or better • Minimum 0.1% or better Accuracy for Voltage and Current. • Minimum 0.2S Class Accuracy for Power and Energy. **2. Real Time Emulator / Grid Simulator for Electric Vehicle Applications** **i) Real Time Emulator with HIL System:** • **Main Processor:** Minimum Two Core based FPGA board or higher for real Time and HIL Simulation, with Analog / Digital input and output Capabilities. • **Simulation Software with Real Time Interface:** Permanent Software License for modeling as well as for real time interface with latest firmware **ii)Grid Simulator – Power Amplifier:** • Input Voltage: Minimum Three – Phase, 415V, 50Hz. • Output Voltage: Minimum Three – Phase, Four-Wire, Isolated 415V • Output Power: Minimum 2 kW or higher	66,24,375

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		Theme based projects (S.No.1) i) Business products, selection strategy, launching strategy, feasibility studies, fund mobilization ii) Research projects iii) Descriptive research	**Business Products such as AC / DC based charging** • Slow Chargers: Minimum Current and Voltage rating of 6A, 48V • Moderate Chargers: Minimum Current and Voltage rating of 10A, 48V • Fast Chargers: Minimum Current and Voltage rating of 15A, 48V • EV Charging Test Facility for moderate / fast Charging of minimum 2kW rating	3,75,000
2.	Soft	**Founding lab structures (Sl.No.4)** i)Course wise, content wise, hands on training, infrastructure, equipment, soft materials, raw materials, water facilities etc.,	**1. Scopecorder for Electric vehicle Applications including Analog voltage i/p module, current clamp, isolated probe and with a hard disk of minimum 500 GB capacity.** **2. Test Bench comprises of AC/DC Converter, Power Factor and Power Quality Enhancement Filter, DC/DC Converter, Reprogrammable development board, Programmable Load Bank and necessary Battery Packs with Battery management Systems.** **a) 3-Phase Source Impedance with Measurement Unit** • Minimum 3 Nos. 0-0.5-1-2-5-10-20 mH/15A variable Tapping inductor will be used to simulate Weak and Strong grid • 3-Phase Multi- Function Meter (MFM) used to monitor Grid Parameters **b) 3 Phase Diode Bridge Rectifier (DBR) to convert 3 Phase AC to DC** **c) Reprogrammable development Board** • Min 20MHz Operating Speed • ADC - Minimum 8 Channel (+/- 10V range) • DAC - Minimum 4 Channel (+/- 5V range) • Can be Reprogrammable **d) DC-DC buck converter for charger** • I/P Voltage - Minimum 600V DC, O/P Voltage - Minimum 48V DC • Power – Minimum 2 kW **e) Lithium ion Battery Packs with suitable BMS for EV: Minimum 48V/30 Ah, 1.44 kWh** **g) Programmable Load Bank:** • Compatible with min. pack voltage of 12V • Rating for min 250W • With inbuilt stop points based on discharge time, end voltage, discharge capacity	28,97,250

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		Hiring charges / fee for experts, consultants, resource persons(Sl.No.5) i) Board of studies, Invited lectures, Skilled professionals, Experts, Trainers– in house and out of the country. Hiring charges for services and out sourcing Skilled man power, lab fees for analysis etc.,	i) Hiring charges / Fee for Experts ii) Skilled Manpower / Lab Fee for Analysis (characterization)	6,00,000
		Salary for faculty, office staff, supporting staff, maintenance etc. (Sl.No.7)	*Man Power* *(1JRF @Rs.32,500/-p.m)* *(2 TA @ Rs.20,000/- p.m)*	6,52,500
		Travel Expenses, Contingent &Miscellaneous Expenses(Sl.No.12)	*Travel by Team Coordinator, Team member, JRFs & TAs for analysis and fabrication.* *Contingency expenses such as stationeries, Consumable and other Miscellaneous Expenses etc.*	5,99,625
Total				**1,17,48,750/-**

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