

RESEARCH SCHEME ON POWER (RSOP)**PROGRESS/TECHNICAL REPORT**

Report for the year : 01/04/2024 to 31/12/2024

PROJECT DETAILS

SL No	Particulars	Details / Information
1	Project Title:	
	Development of an on-board hybrid charging system for hilly-station performance light electric vehicle	
2	a) Name of PI and Dept. where the project is implemented	Dr. Asim Datta, Dept. of Electrical Engineering Tezpur University
	b) Details of PhD candidates / RA / SRF / JRF / Consultants / Temporary Staff involved in the project	Mr. Shyamantak Taj Barman
3	Name of the Research Station / Institute / Organization & Place	Tezpur University Tezpur, District- Sonitpur, Assam-784028, India
	CPRI Codes:	
5	a) R&D Management Code no	CPRI/R&D/TC/GDEC/2022
	b) Accounts Code no	RSOP-TU-129
	c) FAS (H.O) Project ID	FAS Code: 397 Project code: RSOP/21-26/GD/7
	Schedule of the project:	
6	a) Month & Year of project sanction	19.04.2022
	b) Date of commencement of the Project	30/03/2022
	c) Scheduled date of completion	29/03/2024
	d) Project extension date (If any)	31/12/2024
	e) Duration (Years)	Two Years + 9 months (extension)
7	Project outlay (Rs Lakhs)	Rs.31.46 Lakh
8	Aim / Objectives of the Project (State the scope of investigation / research):	
	To design and develop a vehicle on-board hybrid charging system for 48 V, 40 Ah energy storage system.	
	To develop an FPGA/microcontroller based algorithm for vehicle on-board power flow and charging management to be operated from PV/grid/regenerative braking for hilly-station performance light electric vehicle.	
	To improve the uphill driving performance of vehicles utilizing complementary features of battery and supercapacitor while harnessing energy in regenerative braking of vehicle's motor. During downhill driving supercapacitors will be charged through regenerative braking of motor, whereas during uphill driving main battery power will be supplemented by the supercapacitors in order to avoid deep discharging of the main battery.	

Research Scheme on Power (RSOP)

R&D Management Division

Central Power Research Institute

P B No.8066, Sadashivanagar (PO), Bangalore 560 080, INDIA.

Phone No: 080-2207 2234, Fax No: 080-2207 2013, Mob: +91-9972311859

Email id: myvrao@cpri.in

RESEARCH SCHEME ON POWER (RSOP)**PROGRESS/TECHNICAL REPORT****PROGRESS ACHIEVED**

SL No	Particulars	Details / Information												
1	Cumulative progress of work planned (as per the proposal) & work achieved up to the previous quarter (in percentage):	<table border="1"> <tr> <td>Quarter 1: 12.5%</td><td>Quarter 2: 25%,</td><td>Quarter 9: 80%</td></tr> <tr> <td>Quarter 3: 37.7%</td><td>Quarter 4: 50%</td><td>Quarter 10: 85%</td></tr> <tr> <td>Quarter 5: 60%</td><td>Quarter 6: 60%</td><td>Quarter 11: 100%</td></tr> <tr> <td>Quarter 7: 65%</td><td>Quarter 8: 75%</td><td></td></tr> </table>	Quarter 1: 12.5%	Quarter 2: 25%,	Quarter 9: 80%	Quarter 3: 37.7%	Quarter 4: 50%	Quarter 10: 85%	Quarter 5: 60%	Quarter 6: 60%	Quarter 11: 100%	Quarter 7: 65%	Quarter 8: 75%	
Quarter 1: 12.5%	Quarter 2: 25%,	Quarter 9: 80%												
Quarter 3: 37.7%	Quarter 4: 50%	Quarter 10: 85%												
Quarter 5: 60%	Quarter 6: 60%	Quarter 11: 100%												
Quarter 7: 65%	Quarter 8: 75%													
2	Progress of the work carried out during the quarter (Physical Progress):	DC-DC converters are tested. DC/AC converter is developed and tested Development of BLDC motor drive/converter is done. Assembling and testing is done.												
3	Progress of the work carried out during the quarter (Technical Progress):	Development of DC/AC converters and testing are done. Converters and BLDC motor control circuit is developed and tested. Power flow and charging control algorithm is developed. Assembling and testing is done.												
4	Cumulative achievement up to the present quarter in percentage (attach bar chart of activity planned as per original proposal and actual achievement as an Annexure):	100% of work												
5	Slippage and reasons for slippage in progress of project:	Delay in receiving the 2 nd installment of fund. Delay in the process of purchasing equipment												
6	Proposed remedial action to overcome slippage in subsequent quarters:	Equipment are purchased as after the 2 nd installment of project fund is received.												
7	Revised Programme of work for the next three quarters: (If different from the Original proposal)	<table border="1"> <thead> <tr> <th>Quarter ending Choose year</th><th>Quarter ending Choose year</th><th>Quarter ending Choose year</th></tr> </thead> <tbody> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table>	Quarter ending Choose year	Quarter ending Choose year	Quarter ending Choose year									
Quarter ending Choose year	Quarter ending Choose year	Quarter ending Choose year												
8	Details of Papers Published (Specify title) / Seminars and Workshop conducted / attended (Please enclose copy of publications) (prior intimation :													

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RESEARCH SCHEME ON POWER (RSOP)**PROGRESS/TECHNICAL REPORT**

1. Indrajit Koley, Asim Datta, Goutam Kumar Panda, and Sanjoy Debbarma. "TLBO Optimised PID Controller for Coordinated Control in a Hybrid AC/DC Microgrid." In 2022 4th International Conference on Energy, Power and Environment (ICEPE), IEEE, Shillong, 29 April 2022 - 01 May 2022., e-ISBN:978-1-6654-7124-4, p-ISBN:978-1-6654-7125-1 DOI: 10.1109/ICEPE55035.2022.9798062.
2. Rishiraj Sarker, Asim Datta, Arif Sarwat, "Implementation of SHE-MCPWM Technique on a 5L-CHB Inverter for Electric Vehicle (EV) Application" in 2022 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, Dec. 14 - 17, 2022. P-ISBN:978-1-6654-5567-1 e-ISBN:978-1-6654-5566-4. DOI: 10.1109/PEDES56012.2022.10080199.
3. Indrajit Koley, Goutam Kumar Panda, Sanjoy Debbarma, Alejandro Castillo Atoche, Asim Datta, "Plug-in Electric Vehicle Aided Load Frequency Control using Cascaded Controller in Microgrid System," 2023 IEEE IAS Global Conference on Renewable Energy and Hydrogen Technologies (GlobConHT 2023), , Male City Maldives March 11-12, 2023. E-ISBN:979-8-3503-3211-7, p-ISBN:979-8-3503-3212-4; 10.1109/GlobConHT56829.2023.10087793.
4. Yaheya Al Aman, Asim Datta, "An Effective Filter Design for Single-Phase Inverters", EEE Guwahati Subsection Conference (IEEE-GCON 2023), 23 June - 25 June 2023, IIT Guwahati, Guwahati, Assam.
5. Mazumder, Tapashya, Lenience Saha, Shyamantak Raj Barman, Asim Datta, and Anish Ahmad. "Performance Analysis of Isolated Solar PV-Powered Processing Circuit for Light Electric Vehicle." In 2024 5th IEEE International Conference on Circuits, Control, Communication and Computing (I4C), 04 - 05, Oct. 2024, Bangalore , India, pp. 01-06, 2024.
6. Shyamantak Raj Barman; Anish Ahmad; Asim Datta and Vinod Kumar Bussa; "Renewable Energy-Based Hybrid Power Conversion System for Induction Motor Driven Light Electric Vehicle"; 11th IEEE International Conference on Power Electronics Drives and Energy Systems (PEDES), 18-21 Dec., 2024; NITK Surathkal, India, 2024.
7. Shyamantak Raj Barman; Anish Ahmad; Asim Datta; "Validation of a Novel Hybrid On-Board Charging System for Light Electric Vehicles in Hilly Terrain"; 11th IEEE International Conference on Power Electronics Drives and Energy

RESEARCH SCHEME ON POWER (RSOP)**PROGRESS/TECHNICAL REPORT**

Systems (PEDES) 18-21 Dec. 2024; NITK Surathkal, India, 2024.

8. Anurodh Yadav, Sandip Mondal, Liham Wanjen, Asim Datta, "Performance Analysis of Cascaded Bidirectional Converters in Electric Vehicle Applications" 4th IEEE International Conference on Range Technology (ICORT 2025) 06-08 Mar 2025 Integrated Test Range (ITR) Chandpur, DRDO, Ministry of Defence, India (Accepted)

** Kindly furnish details of papers proposed before submission and forward soft as well as hard copies of paper to CPRI

Name and Signature of the Principal Investigator
(With designation)

Asim Datta
Professor
Dept. of Electrical Engineering
Tezpur University

Head of the Organization / Institute
(With seal)

Date:

18/03/25
Registrar
Tezpur University

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RESEARCH SCHEME ON POWER (RSOP)**UTILIZATION CERTIFICATE (UC)**

Report for the year: 01/04/2024 to 31/12/2024

SL No	Particulars	Details / Information
1	Project Title : Development of an on-board hybrid charging system for hilly-station performance light electric vehicle	
2	Name of the Research Station / Institute / Organization & Place	Tezpur University Tezpur, District- Sonitpur, Assam-784028, India
3	Principal Project Coordinator	Dr. Asim Datta
4	CPRI Codes:	
	a) R&D Management Code no	CPRI/R&D/TC/GDEC/2022
	b) Accounts Code no	RSOP-TU-129
	c) FAS (H.O) Project ID	FAS Code: 397 Project code: RSOP/21-26/GD/7
5	Project Outlay (Rs Lakhs)	Rs.31.46 Lakh
6	Schedule of the project:	
	a) Month & Year of project sanction	April. 2022
	b) Date of commencement of the Project	30/03/2022
	c) Scheduled date of completion	29/03/2024
	d) Project extension date (If any)	31/12/2024
	e) Duration (Years)	2 years + 09 months (extension)
7	Year wise allocation of grant (Rs Lakhs):	
	First Year	Second Year
	18.5 Lakh	10.10 Lakh
		Third Year
		-
8	FINANCIAL PROGRESS:	
	a) Grants received from CPRI (Rs Lakhs):	
	Installment	Date
		For the Financial year
		2022-2023
		2023-2024
		2024--2025
		Total
	I	30/03/2022
	18.50 Lakh	-
	II	28/12/2023
	10.10 Lakh	-
	III	
	IV	
	b) Utilization of Grants:	
SL No	Nature of Expenditure	For the Financial year(Rs in Lakhs)
		2022-23
		2023-24
		2024-25
		Cumulative (Rs Lakhs)
1	Establishment Expenditure(Fellowship / Salary of temporary staff)	2.64790 Lakh
2	Travel/ Contingences expenditure	1.42193 lakh
3	Capital Equipment / Accessories	0.47945 Lakh
4	Testing / Consultancy	2.59998 Lakh
5	Consumables/Miscellaneous	9.07800 Lakh
6	Outsourcing of facilities	0.44486 Lakh
7	Institutional overheads	0.50000 Lakh
	TOTAL	0.49975 Lakh
		0.79945 Lakh
		2.59996 Lakh
		17.37012 Lakh
		2.74226 Lakh
		6.83388 Lakh
		26.94626 Lakh
	*** Appropriate Financial years may be mentioned	

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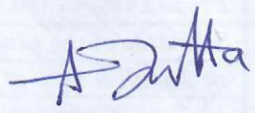
Email id: myrao@cpri.in

**RESEARCH SCHEME ON POWER (RSOP)
UTILIZATION CERTIFICATE (UC)**

9. Certificate from Organization / Institution:-

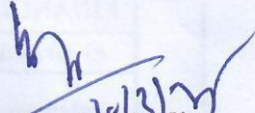
- (a) Certified that out of Rs. NIL of grant-in-aid sanctioned during the year 2024-2025 and Rs. 8.48762/- on account of unspent balance of the previous year (2023-2024), a sum of Rs 6.83388 Lakh has been utilized and that balance of Rs. 1.65374/- Lakh remaining unutilized at the end of the year has been carried forward to the next year (year) / surrendered to the CPRI vide DD No dated
- (b) Certified that I have satisfied myself that the conditions on which the grants-in-aid was sanctioned have been duly fulfilled/are being fulfilled and that I have exercised necessary checks to see that the money was actually utilized for the purpose for which it was sanctioned.
- (c) Quarterly Progress Report (QPR) for the corresponding quarter is enclosed.

Kindly strike off what is not applicable under point 9 (a).


Signature of Principal Investigator
(With designation)

Date: 03/03/2025

Dr Asim Datta
Professor
Dept. of Electrical Engineering
Tezpur University


Head of Accounts / Auditors
(With seal)

Finance Officer
Tezpur University


Head of the Institution / Organization
(With Official Designation and Seal)

Date:

Registrar
Tezpur University

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Account Statement for the period 24/03/2025 to 24/03/2025

Account Number	00000030448821505	Branch	TEZPUR UNIVERSITY
Address	TEZPUR UNIVERSITY,NAPAM,TEZPUR, Sonitpur TEZPUR ASSAM-784028 IN	Account Type	SBCHQ-SURABHI-PUB-OTH-ALL-INR
Account Name	TEZPUR UNIVERSITY R & D	MOD Balance	3,69,00,000.00
Drawing Power	0.00	Interest Rate(% p.a.)	2.7
Balance as on 24/03/2025	460.23		

Date (Value Date)	Narration	Ref/Cheque No.	Branch Code	Debit	Credit	Balance
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10832513624834*CS-IIT Guwahati	TRANSFER FROM 99509044300	4430		8,00,000.00	8,00,460.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10832513625231*CS- Tezpur Univer	TRANSFER FROM 99509044300	4430		184.00	8,00,644.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10832513717682*Tezpur Universit	TRANSFER FROM 99509044300	4430		9,000.00	8,09,644.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10832514339637*CS-IIT Guwahati	TRANSFER FROM 99509044300	4430		7,00,000.00	15,09,644.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10832514340917*CS-IIT Guwahati	TRANSFER FROM 99509044300	4430		3,00,000.00	18,09,644.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10832514340958*CS-IIT Guwahati	TRANSFER FROM 99509044300	4430		5,00,000.00	23,09,644.23
24-Mar-25 (24-Mar-2025)	TO DEBIT THROUGH CHEQUE SBI 7721390 TRANSFER 923672	923672	14259	1,07,768.00		22,01,876.23
24-Mar-25 (24-Mar-2025)	TO DEBIT THROUGH CHEQUE SBI 7721390 TRANSFER 923668	923668	14259	2,49,361.00		19,52,515.23
24-Mar-25 (24-Mar-2025)	TO DEBIT THROUGH CHEQUE SBI 7721390 TRANSFER 923666	923666	14259	1,16,572.00		18,35,943.23
24-Mar-25 (24-Mar-2025)	TO DEBIT THROUGH CHEQUE SBI 7722325 TRANSFER 923667	923667	14259	7,586.00		18,28,357.23
24-Mar-25 (24-Mar-2025)	TO DEBIT THROUGH CHEQUE SBI 7722325 TRANSFER 923673	923673	14259	58,839.00		17,69,518.23
24-Mar-25 (24-Mar-2025)	TO DEBIT THROUGH CHEQUE SBI 7722325 TRANSFER 923669	923669	14259	6,47,269.00		11,22,249.23
24-Mar-25 (24-Mar-2025)	CHEQUE WDL CHEQUE TRANSFER TO 923670	TRANSFER FROM 33834207390 CPRI RSOP & NPP PROJEC 923670	14259	1,65,374.00		9,56,875.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10842515016283*CS- BITS BioCyTiH	TRANSFER FROM 99509044300	4430		5,30,000.00	14,86,875.23
24-Mar-25 (24-Mar-2025)	TRANSFER CREDIT SWEEP DEPOSIT BY TRANSFER	SWEEP FROM 43814173731 TEZPUR UNIVERSITY R&	14259		1,72,483.00	16,59,358.23
24-Mar-25 (24-Mar-2025)	CHQ TRANSFER NEFT UTR NO: SBIN325083233652 923671 SINSIL INTERNATIONAL	923671 SINSIL INTERNATIONAL	14259	16,58,800.00		558.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10842516268248*CS- Tezpur Univer	TRANSFER FROM 99509044300	4430		770.00	1,328.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10842516273537*CS- Tezpur Univer	TRANSFER FROM 99509044300	4430		404.00	1,732.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10842516535917*CS- Tezpur Univer	TRANSFER FROM 99509044300	4430		766.00	2,498.23
24-Mar-25 (24-Mar-2025)	BY TRANSFER NEFT*RBIS0PFMS01*RB10842516624871*CS- Tezpur Univer	TRANSFER FROM 99509044300	4430		376.00	2,874.23

**This is a computer generated statement and does not require a signature.