Phone: (O) 0755-2740395
(R) 0755-2740396
Website: www.rkdf.ac.in
Email: registrar@rkdf.ac.in

NAAC Criterion VII	Institutional Values and Best Practices
Key Indicator:7.3	Institutional Distinctiveness
Metric: 7.3	University Excellence in the Mitigation of Climate Change Leading to Innovation of Technology

7.3: Institutional Distinctiveness:- University Excellence in the Mitigation of Climate Change Leading to Innovation of Technology

Supporting information

Narendra Kumar Lariya

Digitally signed by Narendra Kumar Lariya
Date: 2023.07.21 17:45:37 +05'30'

Ministry of New & Renewable Energy Project

No. 15/12/2014-15/ ST

भारत सरकार/ Government of India

नवीन और नवीकरणीय ऊर्जामंत्रालय / Ministry of New & Renewable Energy

***

Block No.14, C.G.O. Complex, Lodhi Road,
New Delhi – 03, dated: 21st July, 2015.

The Pay & Accounts Officer,
Ministry of New and Renewable Energy,
New Delhi 110 003

Subject: Sanction for implementation of a R&D project entitled "High Energy Density Thermal Energy Storage for Concentrated Solar Plant" by Dr. V K Sethi, Vice Chancellor, Ram Krishna Dharmarth Foundation University, Bhopal.

I am directed to convey sanction of the President of India for implementation of a R&D project on "High Energy Density Thermal Energy Storage for Concentrated Solar Plant" by Dr. V K Sethi, Vice Chancellor, Ram Krishna Dharmarth Foundation University, Bhopal, (RKDF University, Bhopal) at a total project cost of Rs. 41 Lakhs with MNRE share of Rs. 36 Lakhs and Rensselaer Polytechnic Institute, NY, USA (RPI) share of Rs.5 lakhs for a period of 18 months (6 months for installations and 1 year for performance analysis) funded by the MNRE, New Delhi. The detailed terms and conditions of the sanction are as follows:

2 Project Title: High Energy Density Thermal Energy Storage for Concentrated Solar Plant

2.1 Principal Investigator: Dr. V K Sethi, Vice Chancellor, Ram Krishna Dharmarth Foundation University, Bhopal

Co-PI: Dr. Partha S. Dutta, Deputy Director,
Rensselaer Polytechnic Institute, NY, USA (RPI)

2.2 Project Objective:

i) **Broad Objectives:**

The goal of this project is to demonstrate a solar thermal storage system with 1 kW capacity of volumetric energy density exceeding 300 kWh/m3, capable of operating at high temperatures up to 1000 ^{0}C. In comparison, the volumetric energy storage density for water is typically around 80 kWh/m3 and 200 kWh/m3 for molten salts used in solar thermal plants.

2.3 Time Schedule: 18 months (6 months for installations and 1 year for performance analysis)

2.4 Budget: Total budget with item wise break-up:

Sl.	Item	Amount (Rs.)
		Total Cost
1.	Equipment	10,00,000
2.	Manpower	2,40,000
3.	Consumables	2,00,000
4.	Contingencies/ Other Costs	1,00,000
5.	Travel	5,60,000
6.	Consultancy	20,00,000
7.	Institutional Overhead charges	To be borne by the RKDF University
Total		41,00,000

MNRE share: Rs. 36 Lakhs, RPI share: Rs. 5 Lakhs towards international travel

P.T.O.

2.5 Expected Output of the Project:

a) Design and construction of a prototype 1kW capacity solar thermal energy storage system with volumetric energy density exceeding 300 kWh/m^3, capable of operating at high temperatures up to 1000 ^{0}C
b) Field data on energy storage capacity and energy losses of the prototype system.
c) Economic analysis of the solar thermal energy storage system.
d) Joint IPR from the research.
e) Research papers on the final system design and field testing data.

2.6 Monitoring:

MNRE will constitute a project monitoring committee for this project. The project monitoring committee will interact with PI to review the progress and suggest course corrections if necessary.

2.7 IPR and Technology transfer:

The issues relating to IPR and technology transfer will be governed by R&D Policy guidelines as contained in this Ministry's OM No. 1/1/2005-R&D dated 18.10.2010 (copy available on MNRE website www.mnre.gov.in)

3. PI will follow the other guidelines contained in RD&D policy and formats hosted on MNRE website especially as regards to emoluments to project manpower, submission of report, monitoring etc. The general terms and conditions governing this sanction are attached at **Annexure.**

4. I am further directed to convey the sanction of the President of India for release an amount of **Rs. 20,00,000/- (Rupees Twenty Lakhs Only) to RKDF University Project Account, Bhopal** towards implementation of the project.

5. As per the provision contained in the GFR, 2005-Rule 211 (1). **The accounts of all grantee should be open to inspection by the sanctioning authority and audit, both by CAG and internal audit by the principal cum PAO of the Ministry**. The grantee institution is covered under category B-Non-Governmental Organization, in reference to the letter of controller of accounts, MNRE dated 11/7/2005.The bond is required.

6. Drawing & Disbursing Officer of MNRE will draw an amount of **Rs. 20,00,000/- (Rupees Twenty Lakhs Only)** from the Pay & Accounts Officer, MNRE and disburse the same to **RKDF University Project Account, Bhopal** through **RTGS** to their Bank Account No. 586701010050119, IFSC Code – UBIN0558672, MICR Code - 462026016, in the Union Bank of India, Rajiv Gandhi, Bhopal, Madhya Pradesh-462013.

7. The expenditure involved is debitable to Demand No.69 - Ministry of New and Renewable Energy, Major Head 2810-New and Renewable Energy, 104-Research, Design & Development in Renewable Energy, 01-R&D in New & Renewable Energy Technologies, 02-Solar Energy, 31-Grants- in-aid during the year 2015-16 (Plan). This will cover under NCEF.

8. This sanction issues in exercise of powers delegated to this Ministry and with the concurrence of IFD dated 16/07/2015 *vide* their Dy. No. IFD/544/2015-16 dated 26/06/2015 and with the approval of Competent Authority dated 16/07/2015.

21/07/2015

9. The expenditure has been entered in the Expenditure Control Register at Sl. No. 11 on Page No. 11.

Yours faithfully,

21/07/2015

(I.P. Singh)
Director (R&D-Solar)

Copy to:

1. The Director of Audit, CW&M-II (Science Audit) DACR Building, I.P. Estate, New Delhi 110 002.
2. Dr. V K Sethi, Vice Chancellor, Ram Krishna Dharmarth Foundation University, Bhopal.
3. JS (TK)/ DS(F)/US/(F)/Sc-C (AK).
4. Cash Section (2 copies).
5. Sanction Folder.

21/07/2015

(I.P. Singh)
Director (R&D-Solar)

Speed Post

15/01/2018-19/ST

भारत सरकार/ **Government of India**

नवीन और नवीकरणीय ऊर्जा मंत्रालय / **Ministry of New & Renewable Energy**

(सौर अनुसंधान और विकास प्रभाग / (Solar R&D Division)

***

Block No. 14, CGO Complex,
Lodi Road, New Delhi - 10003.
Dated: 29th March, 2019

Sub: Sanction & Release for implementation of a R&D project entitled "System Design, Erection, Testing & Commissioning of 40 kWth and 10 kWe pilot plant aiming at the Feasibility Study of MWe Scale Concentrated Solar Thermal Plant integrated with 24 x 7 Thermal Energy Storage" by Dr. V K Sethi, Ram Krishna Dharmarth Foundation University, Bhopal and RPI USA, along with the release of Rs.10,00,000/- towards Creation of Capital Assets.

Sanction of the President is hereby accorded to the approval of the project entitled ''System Design, Erection, Testing & Commissioning of 40 kWth and 10 kWe pilot plant aiming at the Feasibility Study of MWe Scale Concentrated Solar Thermal Plant integrated with 24 x 7 Thermal Energy Storage" by Dr. V K Sethi, Ram Krishna Dharmarth Foundation University, Bhopal and RPI USA, at a total cost of Rs. 81.50 Lakhs (Rs Eighty One Lakhs and Fifty Thousand only) with Ministry's financial support of Rs. 39.00 Lakhs for a duration of 18 months.

2. The sanction of the President is also accorded to the release of Rs.**10,00,000/- (Rs. Ten Lakh only)** as first instalment of grant under "Creation of Capital Assets" for implementation of the above mentioned project to Ram Krishna Dharmarth Foundation University, Bhopal.

3. The details of the previous release/s is given as under:

Sl. No.	Sanction No. & Date	Amount
1.	Nil	Nil

4. The above sanction will be on the following terms and conditions:-

4.1	Project Title	System Design, Erection, Testing & Commissioning of 40 kWth and 10 kWe pilot plant aiming at the Feasibility Study of MWe Scale Concentrated Solar Thermal Plant integrated with 24 x 7 Thermal Energy Storage
4.2	Principal Investigator	Dr. V K Sethi Vice Chancellor Ram Krishna Dharmarth Foundation , University Gandhi Naga, Bhopal 462033

Registrar
RKDF University

<table>
<tr><td></td><td>Co- Principal Investigator</td><td>Dr. Partha S. Dutta Professor, Electrical, Computer and Systems Engineering Department Rensselaer Polytechnic Institute, Troy, New York</td></tr>
<tr><td>4.3</td><td>Objectives</td><td>• To conduct a comprehensive economic feasibility analysis of a MW e (electrical) scale concentrated solar thermal power (CSP) plant integrated with 24x7 thermal energy storage and

• Engineering design, installation and testing of a pilot plant with 40 kWth (thermal) capacity integrated with 24x7 Thermal Energy Storage (TES).</td></tr>
<tr><td>4.4</td><td>Time Schedule</td><td>18 months</td></tr>
<tr><td>4.5</td><td colspan="2">Budget
<table>
<tr><th>Sl. No.</th><th>Items</th><th colspan="3">Cost (in Rs.)</th></tr>
<tr><td></td><td></td><td>1st Year</td><td>6 Months</td><td>Sharing Cost</td></tr>
<tr><td>1.</td><td>Equipment</td><td>31,00,000</td><td>-</td><td>MNRE</td></tr>
<tr><td>2.</td><td>Manpower</td><td>6,00,000</td><td>-</td><td>MNRE</td></tr>
<tr><td>3.</td><td>Consumables</td><td>1,00,000</td><td>-</td><td>MNRE</td></tr>
<tr><td>4.</td><td>Contingency RKDF Land</td><td>2,00,000</td><td>-</td><td>RKDF</td></tr>
<tr><td rowspan="2">5.</td><td rowspan="2">Travel</td><td>Int. (4,00,000)</td><td rowspan="2">-</td><td>RKDF</td></tr>
<tr><td>Local (1,00,000)</td><td>MNRE</td></tr>
<tr><td rowspan="2">6.</td><td rowspan="2">Consultancy</td><td>20,00,000</td><td rowspan="2">-</td><td>RPI, USA</td></tr>
<tr><td>9,00,000</td><td>RKDF</td></tr>
<tr><td>7.</td><td>Overhead (Custom duty + (10% Shipping etc.)</td><td>7,50,000</td><td>Performance Monitoring</td><td>RKDF</td></tr>
<tr><td>Total</td><td></td><td>81,50,000</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>4.6</td><td>Cost Sharing</td><td>RKDF share - Rs.22.50 lakhs
RPI (USA) share - Rs. 20.00 lakhs
MNRE share - Rs.39.00 lakhs (Equipment-Rs.31 lakh + manpower-Rs. 6 lakh + consumables-Rs. 1 lakh + local travel - Rs. 1 lakh)
Total cost - Rs.81.50 lakh</td></tr>
<tr><td>4.7</td><td>Deliverables</td><td>• Design and Economic Feasibility Analysis of a 1MWe capacity solar thermal energy storage system with volumetric energy density exceeding 300 kWh/m3, capable of operating at high temperatures up to 1000 o C.
• Commissioning and field data on energy storage capacity, energy losses, steam generation and electrical power generation (using steam turbine) of a pilot plant with 40 kW_{th}.
• Joint IPR from the research.
• Research papers on the final pilot plant and field testing data.</td></tr>
</table>

5. This sanction is subject to the condition that the grantee organization will furnish to the Ministry of New and Renewable Energy, financial year wise Utilization Certificate (UC) in the prescribed format of GFR-12(A) and audited statement of expenditure (ASoE) duly

Registrar
RKDF University

reflecting the interest accrued on the grants received/unspent balance under the project along with up to detailed progress report periodically as prescribed under the guidelines. The interest accrued, if any, on the released amount/unspent balance shall be treated as the part of grant.

6. The grantee organization shall ensure that the final statement of expenditure, utilization certificate and project completion report are furnished within one year from the scheduled date of completion of the project.

7. The grantee organization/institution shall be responsible for timely execution of the project as per the Provisions contained in the guidelines and within the allocated budget. Any request for extension of the project duration or for change in budget allocation, for valid reason, shall be placed before the duly constituted Committee for their recommendation before the expiry of the approved period of the project.

8. In terms of Rule 230 (1) of GFR, the grantee organization/institute will certify that it has not obtained or applied for grants for the same purpose or activity from any other Ministry or Department of the Government of India or State Government.

9. As per the Provision contained in Rule 230 of GFR, the Grants-in-Aid will be sanctioned to the grantee to meet the bonafide expenditure incurred not earlier than two years prior to the date of issue of the sanction. The grantee organization/institute shall ensure that the claims furnished by them are not exceeding the sanctioned components within the approved grant.

10. Procurement of capital equipment should be completed in the year mentioned in the sanctioned or in the succeeding financial year if circumstances so warrant. In no case procurement would be allowed beyond the next succeeding year.

11. In terms of Rule 230 (7) of GFR 2017 and instructions of DoE the Programme Implementing Agency shall record the receipt of grant and the expenditure there from in the EAT module of PFMS. Subsequent release would be contingent upon updation in the EAT module and the actual unspent balance recorded therein.

12. The grantee organization/institution shall be liable for recovery of the whole or part amount of the grant/subsidy, with applicable Penal interest, in case of non-compliance of the guidelines of the scheme/sanction.

13. The sanction of the project is subject to the condition that

(a) A transparent procurement procedure in line with Provisions of GFR, 2017 and Manual for Procurement of Goods-2017 will be followed by the Institute/Organization and /or under the appropriate Rules of the grantee organization while procuring capital assets sanctioned for the above mentioned project and a certificate to this effect will be submitted by the Grantee organization immediately on receipt of the grant:

Registrar

(b) While furnishing the Utilization Certificate/Statement of Expenditure, the organization has to ensure submission of supporting documents with regard to purchase of equipment/capital assets as per the provisions of GFR-2017.

(c) The PI will follow the norms strictly as guidelines for Renewable Energy Research and Technology Development Programme vide OM No. 223/90/2017 - R&D dated 21st Feb, 2019.

(d) The PI will follow the norms strictly as per the Guidelines for Renewable Energy Research and Technology Development Programme issued by the Ministry vide OM No. 223/90/2017 - R&D dated 21st Feb, 2019.

(e) For implementation of the project, the temporary manpower i.e SRF, JRF and RA etc. shall be hired in the R&D project based on their expertise/professional qualification in RE field depending upon availability. The hiring of the manpower will be purely on temporary basis with a condition that there will be no liability of such staff for confirmation by government. The staff services shall discontinue immediately after the project duration expires.

(f) The projects as such do not involve hiring of consultants as the projects are implemented by experts in the respective areas, hence hiring of consultants under the project will not be allowed.

(g) The funds released towards equipment to be utilized in first year itself.

15. In terms of provisions contained in Rule 233 of GFR, 2017, the Ministry reserves its rights on the assets created out of grants. Assets acquired wholly or substantially out of government grant, shall not be disposed of without prior approval of the Ministry. Further, if the assets are to be sold, the proceeds there from shall be credited to the account of the Ministry. If the assets are allowed to be retained by the institution/organization, the implementing agency shall include the assets at the book value in their own account.

16. In terms of provisions contained in Rule 236(i) of GFR, 2017, the account of the grantee organization shall be open to inspection by the sanctioning authority and audit (both by C&AG of India and Internal Audit by the Principal Accounts office of the MNRE), whenever the organization is called upon to do so.

17. Due acknowledgement of technical support/financial assistance resulting from this project grant should mandatorily be made by the grantee organization in bold letters in all publications/media releases as well as in the opening paragraphs of their Annual Reports during and after the completion of the projects.

18. The expenditure involved is debatable to Demand No., Ministry of New and Renewable energy for the year 2018-19, as per following details

Demand No.67, Ministry of New & Renewable Energy, Major Head:2810-New & Renewable Energy, 00.104-Research, Design and Development in Renewable Energy, 06-Research and Development-(Sub Head), 00-Research and Development Activities, **35-Creation of Capital Assets (2810.00.104.06.00.35) during the year 2018-19 (Plan).**

19. The amount of **Rs.10,00,000 (Rs. Ten Lakh only)** will be drawn by the Drawing and Disbursing Officer, MNRE and will be disbursed to RKDF UNIVERSITY PROJECT ACCOUNT. The bank details for electronic transfer of funds through RTGS are given below:-

Registrar
RKDF University

Name of Account Holder	RKDF UNIVERSITY PROJECT ACCOUNT
Name of Bank	UNION BANK OF INDIA
Name of Branch	RGPV BRANCH, BHOPAL 0755-2676760
Account Number	586701010050119
Account Type	Current
MICR Code	462026016
IFSC/RTGS Code	UBIN0558672

20. As per Rule 234 of GFR-2017, this sanction has been entered at S. No. 6 & Page No. 11 in the Register of grants for the year 2017-18

21. This issues in exercise of the delegated powers conferred on the Ministry and in consultation of IFD Vide their Dy. No 651 dated 28.03.2019.

29/3/2019

Anil Kumar)
Scientist-C, Solar (R&D)
Tel: 011-24360707 Extn:1034

To

The Pay and Accounts Officer,
Ministry of New & Renewable Energy,
New Delhi.

Copy for information and necessary action to:-

1. The Director of Audit, CW&M-II (Science Audit) DACR Building, I.P. Estate, New Delhi 110 002.
2. Dr.V K Sethi, Ram Krishna Dharmarth Foundation , University, Gandhi Nagar, Bhopal 462033.
3. JS (GKG)/ US/ (F)
4. Cash Section (2 copies).
5. Sanction Folder.

29/3/2019

Anil Kumar)
Scientist-C, Solar (R&D)
Tel: 011-24360707 Extn:1034

Registrar
RKDF University

GENERAL TERMS & CONDITIONS OF THE GRANT FOR R&D TECHNOLOGY DEVELOPMENT PROJECT

1. Approval of the R&D/ technology development project and the grant being released is for the specific project sanctioned and should be exclusively spent on the project within the approved time duration. The grantee organization is not permitted to seek or utilize funds from any other organization (government, semi-government, autonomous and private bodies) for this research project, unless specifically approved for joint funding. Any un-spent balance out of the amount sanctioned must be surrendered to the Government of India through an ECS/ crossed Demand Draft drawn in favour of Drawing & Disbursing Officer, MNRE payable at New Delhi.
2. Full infrastructure facilities by way of accommodation, water, electricity, communication etc. for smooth implementation of the project shall be given by the grantee organization(s) at their cost.
3. For permanent, semi-permanent assets acquired solely or mainly out of the project grants, an audited record in the form of a register in the prescribed format (Annexure-XIII of 'R&D Formats' on home page of www.mnre.gov.in) shall be maintained by the grantee organization. The term "Assets" include (a) the immovable property acquired out of the grant; and (b) movable property of capital nature where the value exceeds Rs. 50,000/-. The grantee organization is required to send to the MNRE a list of assets acquired from the grant. The grant shall not be utilized for construction of any building unless specific provision is made for that purpose.
4. Assets acquired in the project shall be shared proportionately between Government of India and grantee organization(s) in accordance with the cost sharing pattern of the project. The assets should not be disposed off or encumbered or utilized for purpose other than those for which the grant had been sanctioned, without the prior permission of this Ministry.
5. On conclusion/ termination of a project, the Government of India will be free to sell or otherwise dispose off its share of the assets, which are the property of the government. The grantee organization shall render to the Government of India necessary facilities for arranging the sale of these assets. The Government of India has the discretion to gift its share of assets to the grantee organization or transfer them to any other organization if it is considered appropriate.
6. The grantee organization/ PI will furnish Progress Report of the work carried out under the project on six monthly basis in the months of April and October during the project implementation period in a prescribed format given at Annexure-VIII of 'R&D Formats' on home page of www.mnre.gov.in.
7. Officer(s) of MNRE and MNRE designated Scientist/ Specialist/ Expert Panel/Committee may visit the organization periodically to review the progress of the work being carried out and to suggest suitable measures to ensure realization of the objectives of the project. During implementation of the project, the grantee organization will provide facilities to such visitors in the form of accommodation, site visits, etc.
8. On completion of the project, final consolidated 'Project Completion Report' on the work done on the project will be prepared after incorporating suggestions, if any, from the reviewers of the project and 10 copies of the same will be submitted to the MNRE in the prescribed format given at Annexure-XVII of 'R&D Formats' on home page of www.mnre.gov.in, in physical as well as electronic forms.

Registrar
RKDF University

9. The 'Project Completion Report' must include all relevant technical details/specifications, working drawings for designing of the systems/equipment, and an inventory of materials required, etc.
10. At the time of seeking further installment of grant and closure/ termination of the project, the grantee organization / PI has to furnish the following documents:
    a. Utilization Certificate (U.C) for MNRE grant and 'Statement of Expenditure' (S.O.E.) for the total expenditure for the previous financial year (in original or copy if sent earlier) in enclosed formats given at Annexure-IX, X and XI (of 'R&D Formats' on home page of www.mnre.gov.in).
    b. Latest authenticated 'Statement of Expenditure' including Committed Expenditure, for the expenditure on the project including cost shared by any other organization since 1st April of that financial year till the previous month; and
    c. Technical Progress Report, if not sent earlier.
11. The Comptroller & Auditor General of India, at his discretion, shall have the right of access to the books and accounts of the grantee organization maintained in respect of the grant received from the Government of India.
12. The grantee organization will maintain separate accounts for the project in a Bank. If it is found expedient to keep a part or whole of the grant in a bank account earning interest, the interest thus earned should be reported to the MNRE and should be reflected in the 'Statement of Expenditure'. The interest thus earned will be treated as a credit to the Institute to be adjusted towards further installment of grant.
13. The grantee organization will neither entrust the implementation of the work for which the grant is sanctioned to another institution nor will it divert the grant receipts to other institute as assistance. In case the grantee organization is not in a position to implement or complete the project, it should, forthwith, refund to this Ministry the entire grant or the balance received by it at the earliest.
14. All the personnel including Research personnel appointed under the project, for the full/ part duration of the project, are to be treated as project personnel on contract to the organization and will be governed by the Administrative rules/ service conditions (for leave, TA/DA etc.) of the implementing Institute. They are not to be treated as employees of the Government of India under any circumstances and the MNRE will have no liability, whatsoever, for the project personnel after completion of the project duration.
15. For the expeditious implementation of the research project, the PI will take the assistance of the grantee organization in the process of selection and appointment of staff and payment to them in accordance with the guidelines given at Annexure-VII of 'R&D Formats' on home page of www.mnre.gov.in. Scale and emoluments for the posts not covered in the said guidelines are to be governed by the norms prevalent in the grantee organization or as decided in consultation with MNRE. Deviations from these guidelines, generally, shall be considered only in consortium projects or projects taken up by an industry on 50:50 cost sharing basis.
16. The Ministry reserves the right to terminate the project at any stage if it is convinced that the grant has not been properly utilized or sufficient progress has not been reported under the project or sufficient efforts have not been devoted.
17. The project becomes operative with immediate effect or within a maximum of one month from the date on which the ECS/ Draft/ Cheque is received by the implementing Institution. This date should be intimated by the grantee authorities/ Principal Investigator to this Ministry.
18. The grantee organization shall associate a co-PI with the project, if not already part of the project team. The co-PI shall function as PI in the absence of PI and should be

Registrar
RKDF University

totally in knowledge of the activities of the project to avoid loss to the project in case PI leaves the project / organization.

19. If the PI to whom a grant for a project has been sanctioned wishes to leave the grantee organization where the project is sanctioned, the grantee organization/ PI will inform the same to the Ministry and in consultation with MNRE, evolve steps to ensure successful completion of the project through co-PI, before relieving the PI or appoint another Scientist as PI.
20. If the results of research are to be legally protected under IPR, the results should not be published without action being taken to secure legal protection for the research results.
21. Investigator(s) wishing to publish technical/ scientific papers based on the research work done under the project should acknowledge the assistance received from MNRE, indicating the project sanction no. under which grant has been given to the grantee organization. The PI will submit a copy of the paper to the Ministry as soon as it is published.
22. If the results of the work carried out under the grant require preparation of a technical booklet/ guides/ software/ CD etc. in such cases the grantee organization will publish/ prepare sufficient copies (number of copies to be decided in consultation with MNRE) and keep a portion for their use/ dissemination and submit the remaining copies to the Ministry for their use and distribution.
23. If the result is in the form of a survey report / product performance evaluation or other such activities which have commercial implications, the grantee organization will not publish the results without specific written approval of this Ministry.
24. The grantee institution/ PI should provide a copy of the 'Full Text Document' of the Patent/ PI within one month of its publication.
25. The grantee organization(s)/ Inventor(s) are required to seek protection of Intellectual Property Rights for the results/ output of the sanctioned RD&D projects and shall share royalty/ proceeds of sale of IPR in accordance with the guidelines given below:

i. The Government shall have a royalty-free license/ marching right for the use of the Intellectual Property for the purposes of the Government of India and this Ministry reserves the right to require the institution and the industry to license others and that anyone exclusively licensed to market the innovation in India, must manufacture the product in India.

ii. In case MNRE files patents (when grantee organization is unable to file a patent) any earnings accruing from transfer and commercialization shall be shared equally by this Ministry with the Institution and the generator of the Intellectual Property. However, wherever the expected earnings are above Rs.10 lakh, the proportion of sharing can be 40% for the institution, 40% for this Ministry and 20% to the generator of Intellectual Property.

iii. The grantee organization(s) is permitted to retain the benefits arising out of the IPR. In case of more than one institution, IPR generated through joint research can be owned jointly by them as may be mutually agreed to by them through a written agreement.

iv. The institution and industry may transfer the technology to another industry for commercialization, on terms and conditions as may be mutually agreed upon, on non-exclusive basis under intimation to MNRE. Any earnings accruing from such a transfer and commercialization shall be shared between the institution and the industry as may be mutually agreed to. The details of the agreement, amounts-received, annual sales turnover of the product shall [illegible] this Ministry.

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

v. In case of projects supported solely to industry, any earnings arising out of sale/transfer of IPR generated through the MNRE supported project shall be shared between the MNRE and the industry in the ratio of their individual shares of the project cost.

vi. Other terms and conditions regarding IPR issues shall be in accordance with the guidelines contained in the DST circular issued with the concurrence of Ministry of Finance, Department of Expenditure vide their O.M. No.33 (5)PF- II99, dated 22nd February, 2000 or subsequent circulars which may be issued by DST/ MOF on the subject (Annexure-XV of 'R&D Formats' on home page of the Ministry (www.mnre.gov.in).

26. In case of any dispute the decision of Secretary, Ministry of New and Renewable Energy shall be final.

***

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

ENCL : 05

"A write up on technology transfer details of Solar Thermal Project- June 2016"

1.	Project Title	:-	**High Energy Density Thermal Energy Storage for Concentrated Solar Plant**
2.	MNRE Sanction order No &date: -		**15/12/2014-15/ST& date 21st July, 2015.**
3.	Name and complete address of PI :-		**Dr. V.K. Sethi, Vice Chancellor, Ram Krishna Dharmarth Foundation (RKDF) University, Bhopal**
4.	Name and complete address of Co-PI from other participating Institution		**Dr. Partha S. Dutta, Deputy Director, Rensselaer Polytechnic Institute, NY, USA (RPI)**
5.	Date of start of the project and Scheduled completion date		**1st September 2015**
6.	Approved project budget		**Rs.36, 00,000 (MNRE), Rs. 5, 00,000 (RPI)**

7 TECHNOLOGY TRANSFER REPORT (14 to 22 June 2016)

Undersigned visited Rensselaer Polytechnic Institute –RPI, Troy, New York from 14th to 22nd June 2016 during my personal visit to Seattle, USA. The RPI is about 200 year old Center of learning in US in Engineering and Technology which was established in 1824. The New York State Center for future Energy systems and Smart Lighting Engineering Research Center were the focus areas of my study of Technology Transfer in Solar Thermal and Thermo Electrics jointly with Co-PI of the Project Dr. Partha S Dutta. There are three categories of research and development activities that were undertaken by the RPI team for this project and technology transfer deliverables made. A brief summary of each topic is included below.

7.1 Low cost high efficiency thermal storage material development

A host of metals, insulators and semiconductor materials were tested for its sensible heat storage capabilities. These include: aluminum, copper, stainless steel, iron, brass, silicon, silica, alumina, zinc oxide, iron oxide, silicon carbide, sand and gravel, mineral oil (Dowtherm Oil), salts (LiCl, KCl, NaCl and their mixtures). The goal was to select high melting point (close to 1000 ^{o}C) and with high heat capacity and low density. At the same time, the cost of the material required to fill the entire volume of the storage container played a deciding role in the final selection of the material. Composites of the metal-insulator-semiconductor were also evaluated. Eventually, a

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nag

new composites developed at RPI was found to meet the criteria for the project. The 300 KWh/m^3 of thermal energy density storage with the lowest cost and material operability of 1000 °C were met by a novel composition of NaCl-Fe_2O_3 composite. Crystals of 240 pounds (lbs) were synthesized and shipped to RKDF for this project. The photos of these crystals are presented in the appendix of this report. This composite provide the necessary 300 KWh/m^3 of thermal energy density storage when heated to 565 °C based on analysis performed with the specific heat capacity and density as shown below. This material has been successfully heated in air up to 1400 °C for short period without any melting observed. Also the material is resistant to moisture and humidity unlike pure NaCl crystals (table salt). At laboratory scale synthesis process, the cost of this storage material is calculated as $1.9/kWh. The energy stored per unit mass is 140 watts/kg.

Thermal energy stored in a solid mass (sensible heat) by raising its temperature was calculated as follows:

The heat or energy storage is given by:

$$Q = V \rho c_p dt$$

Q = sensible heat stored in the material (J)
V = volume of substance (m^3)
ρ = density of substance (kg/m^3)
c_p = specific heat of the substance (J/kg °C)
dt = temperature change (°C)

Temperature necessary to stored 300 KWh in 1 m^3 of Salt Crystals
(Thermal Energy Density: 300 KWh/m^3)

$$dt = Q/ (V \rho c_p)$$

Q (in KWh) = Q (in KJ) /3600 (second/hour)

$$Q \text{ (in KJ)} = 3600 \times 300 = 1.08 \times 10^6 \text{ KJ}$$

$$Q = 1.08 \times 10^9 \text{ J}$$

$$V = 1 \text{ m}^3$$

$$\rho = 2200 \text{ kg/m}^3$$

$$c_p = 870 \text{ J/kg °C}$$

Using the above values, we get:

$$dt = 565 \text{ °C}$$

Vice Chancellor
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Airport Bypass Road, Gandhi Nagar,

Hence we need the core temperature to rise up to 565 °C to capture and store 300 kWh/m³ of thermal energy density.

For comparison, the properties of some common materials are shown below for the design of Core heat transfer device.

Cast copper alloy C90500 (Gun Metal)
Chemical composition: Sn=10.0%, Zn=2.0%, Cu=88%
Density: 8720 kg/m³
Specific heat capacity: 377 J/(kg*K)
Thermal conductivity: 74.8 W/(m*K)
Melting temperature: 999 °C
Softening temperature: 854 °C

Copper:
Density: 8960 kg/m³
Specific heat capacity: 383 J/(kg*K)
Thermal conductivity: 385 W/(m*K)
Melting point: 1084 °C

Cast Iron:
Density: 7900 kg/m³
Specific heat capacity: 837 J/(kg*K)
Thermal conductivity: 50-80 W/(m*K)
Melting point: 1200 °C

Aluminum:
Density: 2700 kg/m³
Specific heat capacity: 900 J/(kg*K)
Thermal conductivity: 204 W/(m*K)
Melting point: 659 °C

New design of Core was prepared at RPI during stay of Undersigned using copper; the same will be manufactured at Bhopal in July 2016.

7.2 High temperature corrosion resistance coating

Corrosion of metal walls and embedded water/steam pipes used in thermal storage tanks using salt at high temperature is a major issue. To avoid long term degradation, protective coating is necessary. Coating materials such as CVD deposited SiC or metal oxides such as alumina, zirconia, etc. are very expensive and only used for niche applications. One the other hand polymeric coatings such as polyurethane mixed with nanoparticles or similar nanocomposites can only sustain low operating temperatures (below 400 °C). Based on research at RPI over the last 2 decades on high temperature corrosion resistance coating, a specific formulation was

developed for this project. Synthesis of SiC nanocomposite paint (black in color) was conducted using carbon containing precursor such as Apiezon W wax dissolved in xylene and silicon containing precursor such a tetraethylsilane or tetraethyl orthosilicate. These precursors were mixed using hydrogen carrier gas and injected into a furnace in the temperature range of 850-1100 °C. The SiC particles formed were found to be embedded in a carbon-rich and silicon-rich phases exhibiting polymeric properties. The reacted mixture of the SiC nanoparticles with the multi-phase material was dispersed in petroleum oil (kerosene or gasoline) prior to application on any metal surface. After drying these coatings were found to be resistant to any corrosive environment. A quantity of 2-3 liters of the SiC-polymeric nano-composite was delivered to RKDF University and was used for coating the interior metallic surfaces of the thermal storage unit. Photos of the precursors and final nano-composite are shown in the appendix.

7.3 Conceptual System design

The conceptual system designs of the entire thermal storage configuration including sketches with dimensions were finalized during the period of stay (now being transmitted to associated industry partners). The designs of the salt core, heat transfer pathways and solar tracker designs were revised as discussed in previous Para. The goal of these designs exercise was to enable low cost manufacturing of the entire unit in India using locally available raw material and labor resources.

8 Details of "Indigenous design of CSP and thermal storage based on imported components and designs"

Discussions were held with Co-PI Dr. Partha on the long term goal of this project is develop the necessary technology know-how to enable the manufacturing process in India for large scale MW systems. While the entire system integration and construction has to be done in India at the location where it will operate in the field, there are key components that must be imported in the near term. In the future, these components can also be developed and manufactured by a commercial entity by technology licensing or marketing from abroad. **The following is the list of components that will be imported for future Mega Watt Scale Project:**

i. Fresnel lens:

High optical quality large area Fresnel lens in not manufactured in India. The necessary lens is available in large quantities from China or USA. The cost of this lens is within the range necessary for the economic feasibility of the entire system.

ii. Thermal storage material:

High quality salt crystals are key to the performance of the energy storage system. These materials are not available commercially in India. The RPI team has conducted toll production

analysis with a suitable commercial vendor in USA. Materials necessary in large quantities can be supplied for large power plants in India. The manufacturing of these advanced materials would require significant infrastructure investment in India. This will be evaluated in the future. The cost of storage materials manufactured in USA is within the range necessary for the economic feasibility of the entire system.

iii. Corrosion resistant nano-coating:

The corrosion resistant coating is a unique formulation developed by RPI. The synthesis of the polymeric nanocomposite requires special chemical and high temperature processes that are not available in India. Due to low volume requirement, the RPI team will synthesize this material in the laboratory at RPI. In the future, when large volume is necessary, it can be toll manufactured by a US chemical manufacturer and supplied directly for projects in India.

iv. Solar tracker design:

While there are numerous commercially available solar trackers available in India, there are two issues: 1. These trackers are not suitable for integrating with the thermal storage core unit at the ground level or underground. 2. The costs of various tracker configurations are significantly high to adopt for this application. The RPI team in conjunction with a commercial vendor in USA has developed low cost solar tracker that can be easily integrated and automated with thermal storage unit. The design of suitable trackers along with the list of components will be provided to a local Indian manufacturer/workshop where it could be built.

v. Heat transfer element and core insulation designs:

Heat transport from the focal point of the lens to the salt core is a crucial part of the system and dictates the system storage efficiency. The RPI team based on experiments and thermal simulation will provide the necessary designs for this project. Some of the components like insulation material, coils and rods for heat transport, etc. will be selected by the RPI team based on thermal modeling. These components will be acquired from US commercial vendors and shipped to India.

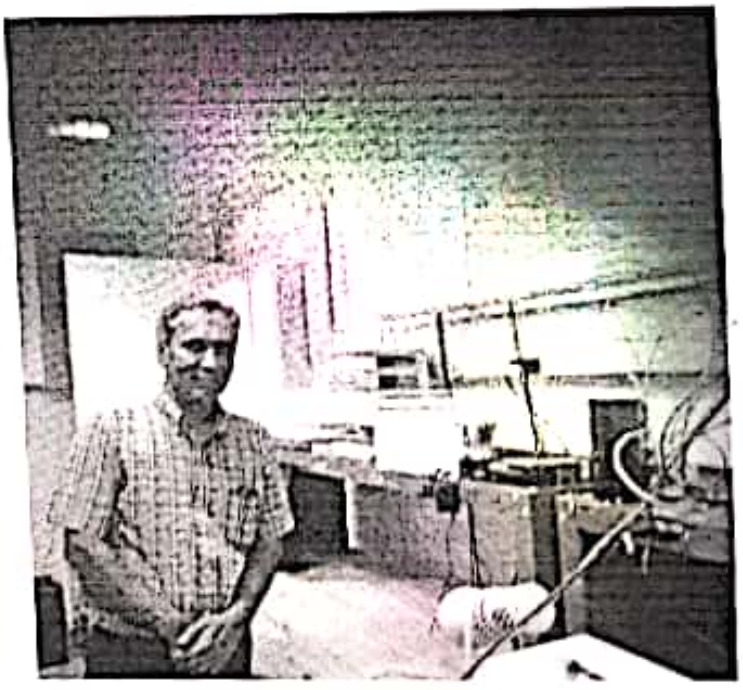
Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,

PI Dr. V.K. Sethi at Rensselaer Polytechnic Institute (RPI) USA, 14 to 22 June 2016

Co-PI Dr. Partha S. Datta at Technology Incubation Center

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

Corrosion Resistant Nano Technology Lab at LESA Technology Incubation Center



Thermo Photo voltaic Lab at LESA Technology Incubation Center

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

Memorandum of Understanding

This Memorandum of Understanding ("MOU") entered into on 8 July 2016 ("Effective Date") by and between Rensselaer Polytechnic Institute, having offices at 110 8th Street Troy, New York, USA ("RENSSELAER") and Ram Krishna Dharmarth Foundation University, having offices at Airport Bypass Road, Gandhinagar, Bhopal, Madhya Pradesh 462033, India ("RKDF"). RENSSELAER and RKDF may be referred to individually as "Party" and collectively as the "Parties.")

WITNESSETH:

WHEREAS, RENSSELAER possesses valuable skills, knowledge, expertise, and resources in the field of "solid state lighting, renewable energy, power electronics, and healthcare"; and

WHEREAS, RKDF is a private university with a mission of harmonizing higher education with excellence in science and technologies and performing as a premium national university providing dedicated service for social and economic growth;

WHEREAS, RENSSELAER and RKDF desire to explore a collaboration for the development of joint research, prototype and test-bed development, and joint proposals;

NOW THEREFORE, in order to develop this business alliance, RENSSELAER and RKDF understand the principal points of the cooperative efforts to include the following:

1. **Efforts of the Parties During the Term of this MOU**

   A. The Parties shall examine and discuss collaborative activities for the following potential projects:

   - Exchange of students and faculty
   - Joint Short Term Courses in Energy, Physics & Micro-electronics
   - Joint seminars/conferences/workshops
   - Summer Activities and Programs
   - Joint research proposal development

2. **Confidentiality**

For a period of three years after disclosure, each Party agrees to keep secret and confidential all information ("Confidential Information") received from the other Party in connection with this MOU which is clearly marked as such, or if oral, is identified as confidential and thereafter promptly confirmed as confidential in writing. The Parties further agree not to use or disclose Confidential Information for any purpose whatsoever or make any public statement in relation to this MOU, without the prior written consent of the other Party, except for disclosures as required by law. The foregoing shall not apply to information in the public domain or information in the possession of the receiving Party prior to the commencement of this MOU.

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Na

3. **Governing Law**

This MOU shall be construed and governed exclusively by the laws of the State of New York, U.S.A., without regards to conflict of laws provisions.

4. **Entire Agreement**

This MOU and the documents referenced herein constitute the entire MOU between the Parties in connection with the subject matter hereof and will supersede all prior agreements, whether oral or written, whether explicit or implicit, which have been entered into prior to the execution hereof.

5. **Non-binding MOU**

This MOU is not, nor is it intended to be, legally binding. Except for the commitments stated in Paragraph 2 ("Confidentiality") of this MOU, this MOU does not give rise to any binding obligations, express or implied any and neither party will be liable to the other for the failure to agree upon a definitive agreement. In particular, but without limiting the foregoing, no intellectual property rights are affected by this MOU. Any commitment of resources, financial or otherwise, must be made in specific agreements to be entered into for this purpose at a subsequent date. In addition, neither Party should act or fail to act in detrimental reliance on this MOU.

6. **Term**

This MOU shall be for the duration of three years, commencing on the Effective Date, unless extended in a writing mutually agreed upon by the parties.

IN WITNESS WHEREOF, the parties have caused this MOU to be executed by their duly authorized officers or representatives on the date first above written.

For and on behalf of
RENSSELAER

Richard E Scammell
Director
Research Administration

For and on behalf of
RKDF University

Name: Dr. Sadhna Kapoor
Chancellor

Name: Dr. V.K. Sethi
Vice Chancellor

Vice Chancellor
RKDF University

Name: Dr. B.N. Singh
Registrar

Registrar
RKDF University

2

Vice Chancellor
RKDF University

ENCL: 01

Rensselaer

Design, Analysis, Construction and Field Operation Demonstration of a 5 MW Capacity Thermal Storage Module along with a Dispatchable 1.6 MW Solar Power System with 60 MW Energy Storage Capacity

BY

Ram Krishna Dharmarth Foundation (RKDF) University

&

Rensselaer Polytechnic Institute

110 8th Street, Troy, New York 12180

Proposal

SUBMITTED TO

MNRE for 6 MONTHLY PROGRESS REPORT AS ON MARCH 2020

Co-PI: Professor Partha S. Dutta,
Rensselaer Polytechnic Institute, Troy, New York – 12180-3590, USA
Phone: (518)-276-8277; e-mail: duttap@rpi.edu

PI: Dr. V. K. Sethi
D G (Research), RKDF University, Airport Bypass Road, Gandhi Nagar, Bhopal, 462033
e-mail: dgresearch@rkdf.ac.in vksethi1949@gmail.com

Ram Krishna Dharmarth Foundation (RKDF) University, Gandhi Nagar, Bhopal 462033, Madhya Pradesh, India
Administrative Contact at RPI: Jennifer Newnham, Grant Administrator
e-mail: newnhj@rpi.edu; Phone: 518-276-6173
Administrative Contact at RKDF: VC, RKDF & Director Management RKDF , University

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Naga

Public Financial Management System-PFMS (formerly CPSMS)
O/o Controller General of Accounts, Ministry of Finance

Welcome: **Vinod Krishna Sethi**
User Type: **AGENCYDA**
Agency: **Ram Krishna Dharmarth Foundation (RKDF) University, Bhopal**
Financial Year: **2019-2020**

[vksethi] Logout Change Password

Home | EAT_ | Expenditure | Monitoring | E - Payment | DBT | Others

E10 - Scheme wise Expenditure — Hide Filter

Scheme Name: CENTRAL POWER RESEARCH I

From Date: 01/04/2019 To Date: 10/03/2020

Figures In: (•) Actuals ( ) Thousands ( ) Lakhs ( ) Crores

View Report

1 of 1 Find | Next

Agency Scheme wise Level Break Up

Scheme Name :	CENTRAL POWER RESEARCH INSTITUTE [0747]
Period :	01-04-2019 / 10-03-2020
Figures In :	Actuals (in Rs.)

Name	Period	Expenditure (Rs)	Advances (Rs)
⊟SUB-CENTRAL		14,00,000.00	0.00
	June-2019	12,06,000.00	0.00
	July-2019	20,000.00	0.00
	August-2019	30,365.00	0.00
	September-2019	20,500.00	0.00
	October-2019	80,426.00	0.00
	November-2019	35,000.00	0.00
	December-2019	5,000.00	0.00
	March-2020	2,709.00	0.00

Public Financial Management System Page No:1 / 1 07/03/20 15:11

https://pfms.nic.in/Reports/AgencyUserWiseAccountDetail.aspx

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

As on 31- March 2020

STATEMENT OF EXPENDITURE – MNRE PROJECT (RKDF / RPI: USA)

S.N.	Items	Sanctioned Cost (in Rs.) As per Sanction No 15/01/2018-19/ ST Dated 29 March 2019		Expenditure in Rs. as on 5th March 2020	REMARKS	Sharing cost
		1st year	6 months			
1	Equipment	31,00,000	-	15,65,075.00	Enlys Energy , USA Taylormade Renewables, ADI	MNRE
2	Manpower	6,00,000	-	2,96,500.00	Project Manager , Technician & Audit and Accounts	MNRE
3	Consumables	1,00,000	-	81,075.00	-	MNRE
4	Contingency	2,00,000	-	1,94,000.00	Site preparation, Foundations 32 No. for Solar Disc, Fencing of Plant Area, Test bed set-up for Storage , Lifting tools and Tackles, Hydra & JCB Rentals	RKDF
5	Travel	Int. (4,00,000)	-	2,20,000.00	Two visits to CO-PI from –To and Fro USA - India	RKDF
		Local (1,00,000)	-	57,350.00	Visit to Delhi, TAYLORMADE Ahmadabad	MNRE
6	Consultancy	20,00,000	-		-	RPI ,USA
		9,00,000	-	1,11,000.00	Short term Courses on "Solar Thermal" during International Conferences	RKDF
7	Overhead (Custom duty + 10%, Shipping etc.)	7,50,000	Performance Monitoring		Custom Duty will be paid by RKDF University after arrival of Shipment from ENLYS Energy, USA	RKDF
Total		81,50,000		Total MNRE: 20,00,000.00 Total RKDF: 5,25,000.00 Grand Total: 25,25,000.00	TOTAL FUND RELEASED BY MNRE Rs. 20.00 Lacs	

Director General (Research)
RKDF University

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

केन्द्रीय विद्युत अनुसधान संस्थान
(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)
प्रो सर सी. वी. रामन रोड, सदाशिवनगर डाक घर, पो. बा. सं. 8066, बेंगलूर - 560 080
CENTRAL POWER RESEARCH INSTITUTE
(A Govt of India Society under Min. of Power)
Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8066, Bangalore - 560 080, India
वेबसाइट/website : http://www.cpri.in

अनुसंधान एवं विकास प्रबंधन प्रभाग
R & D Management Division

सीपीआरआई/आर&डी/टीसी/थर्मल/२०१९
CPRI/R&D/TC/Thermal/2019

दिनांक/Date: 06.02.2019.

Dr. V. K. Sethi (PI)
Vice Chancellor, RKDF University
(RKDF) University, Airport Bypass Road
Near RGPV, Gandhi Nagar, Bhopal – 462033
& Rajiv Gandhi Proudyogiki Vishwavidyalya,
(State Technological University of MP), Bhopal-462033

Dear Sir,

विषय / Sub: Approval of RSoP Project Proposal titled "Post Combustion Carbon Capture & sequestration (CCS) Plant on a Coal Fired Thermal Power Plant – Feasibility Study"

Kind reference is invited to the above cited R&D project proposal which was presented during the 5th meeting of the Technical Committee on Thermal Research held on 12th July 2018 at CPRI Bangalore. The said project proposal submitted under the RSoP Scheme of CPRI has been recommended for funding by the Technical Committee (TC) on Thermal Research. Further, the Competent Authority has approved the recommendations of the Committee. The total approved financial outlay of the project is Rs. 38.50 Lakhs and the duration is 1.5 years.

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

The items of expenditure for which the total allocation of Rs. 38.50 Lakhs has been approved are given below:

SL No	Particulars	Year wise break up (*Rs Lakhs*)		Total Cost (*Rs Lakhs*)
		I year	II year	
1	**Major Equipment's** a) 30% CO_2 capture & sequestration table top plant: design- Engineering & installation of pilot plant comprising of MEA vessels, transfer pumps, piping etc. b) Design & Engineering – Data Acquisition System & Instrumentation & controls *c)Design Engineering, installation & commissioning of Solar Plant and Interposing a solar steam generator on coal fired Thermal Power Plant for regeneration of MEA solvent	**10.00** **00.00** -	**05.00** **10.00** -	**15.00** **10.00** -
2	Software / Hardware	-	-	-
3	Temporary man power (SRF/JRF/RA/PA/Consultancy)	**02.00**	**02.00**	**04.00**
4	Consumables / Miscellaneous	-	**01.00**	**01.00**
5	Travel / Contingencies	**02.00**	**03.00**	**05.00**
6	Cost of Project Management by CPRI @ 10%	**03.50**	-	**03.50**
7	Others (*if any*)	-	-	-
	Grand total from CPRI	**17.50**	**21.00**	**38.50**

*Item for which expenses (amounting to Rs. 15 Lakhs (approximately) as per approved proposal) will be borne by RKDF University.

The first installment of grant-in-aid amounting to Rs. 14.00 Lakhs was transferred to RKDF University, Bhopal on 17.12.2018.

सादर / Thanking You,

भवदीय / Yours faithfully,

(आर. ए. देशपांडे / R.A. Deshpande)
अपर निदेशक, सीपीआरआई / Additional Director, CPRI
आर एंड डी प्रबंधन- प्रभाग प्रमुख / HoD, R&D Management
rad@cpri.in, 9449056349

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar,
BHOPAL (M.P.)-462033

Participation in International Climate change Forum

Registrar
RKDF University

Dr. (Mrs) Sadhna Kumari
MBBS, PGDBM
Chancellor

Tel 0755 - 2746165
Fax 0755 - 4270916
Website www.rkdf.ac.in
Email info@rkdf.ac.in

RKDF UNIVERSITY

ESTABLISHED BY AN ACT OF GOVT OF MP AND APPROVED BY UGC UNDER 2(f) 1956

No. 384 /RKDF/ 2018

Dated 11 /07/ 2018

To,

Dr. V.K. Sethi

Vice Chancellor

RKDF University, Gandhi Nagar

Bhopal, M P 462033

Subject : Visit to International Conference on Solar Thermal (ICEEE) at A Herriot Watt University Edinburg, UK, Aug 11, 2018 – Aug, 16, 2018

Reference: Your office letter No VC/RKDF/Conf/ICEEE/UK/2018-19 Dated 11-07-2018

Dear Dr. Sethi

With reference to your letter dated 11th July 2018 the University is pleased to permit you to visit **International Conference on Solar Thermal (ICEEE) at A Herriot Watt University, Edinburg, UK** to present a paper in **International Conference on Solar Thermal (ICEEE) at A Herriot Watt** from ***August 11, 2018- August 16, 2018***. You will be considered on **Official Duty leave** on the above dates and also days required for Pre and Post Journey period. Please submit a detailed report of the visit for further University records.

Best wishes.

(Dr. Sadhna Kapoor)
CHANCELLOR
RKDF UNIVERSITY
BHOPAL

Copy forwarded for information & necessary action to:

(1) Registrar, RKDF University, Bhopal

(2) CAFO, RKDF University, Bhopal

Registrar
RKDF University

Ph. : (O) 0755-2740395
Website : www.rkdf.ac.in
Email : info@rkdf.ac.in

RKDF UNIVERSITY

[ESTABLISHED UNDER GOVT. OF M.P. AND APPROVED BY UGC 2(F) (1956)]

No. VC/RKDF/GHGT-14/Aus/2018-19 Dated : 11/10/2018

11/10/2018

To,

Hon'ble Chancellor

RKDF University

Bhopal

Sub: Visit to International Conference GHGT -14 Carbon Capture at Melbourne, Australia

Madam,

I have been invited to present a paper on behalf of Indian Power sector on Carbon Capture and a key note address on "Solar Integrated CCS" at Melbourne, Australia from October 19, 2018 – October 29, 2018. A copy of Invitation, from organizers and presentation first page are attached.

Kindly provide me duty leave. I will bear my International / Local travel and other expenses.

Dr. V K Sethi 11.10.2018

VC

Vice Chancellor
RKDF University
Airport Bypass Road, Gandhi Nagar Campus
BHOPAL (M.P.) 462033

Registrar
RKDF University, Bhopal

Dr. (Mrs) Sadhna Kumari
MBBS, PGDBM
Chancellor

RKDF UNIVERSITY

(ESTABLISHED BY AN ACT OF GOVT OF MP AND APPROVED BY UGC UNDER 2(F) 1956)

Tel. 0755 - 3746165
Fax 0755 2 427016
Website www.rkdf.ac.in
Email info@rkdf.ac.in

No. 671 /RKDF/ 2018

Dated : 11 /10/2018

To,

Dr. V.K. Sethi

Vice Chancellor

RKDF University, Gandhi Nagar

Bhopal, M.P 462033

Subject :- Visit to International Conference GHGT-14 Carbon Capture at Melbourne, Australia

Reference : Your office letter No VC/RKDF/GHGT-14/AUS/2018-19 Dated 11-10-2018

Dear Dr. Sethi

With reference to your letter dated 11th Oct. 2018, the University is pleased to permit you to visit International Conference GHGT-14 Carbon Capture at Melbourne, Australia to present a paper on behalf of **Indian Power sector on Carbon Capture and a key note address on "Solar Integrated CCS" at Melbourne, Australia,** from ***October 19, 2018- October 29, 2018*** You will be considered on **Official Duty leave** on the above dates and also days required for Pre and Post Journey period. Please submit a detailed report of the visit for further University records.

Best wishes.

(Dr. Sadhna Kapoor)
CHANCELLOR
RKDF UNIVERSITY
BHOPAL

Copy forwarded for information & necessary action to:

(1) Registrar, RKDF University, Bhopal

(2) CAFO, RKDF University, Bhopal

Registrar
RKDF University

Ph. : (O) 0755-2740395
Website : www.rkdf.ac.in
Email : info@rkdf.ac.in

RKDF UNIVERSITY

[ESTABLISHED UNDER GOVT. OF M.P. AND APPROVED BY UGC 2(F) [1956]]

No. VC/RKDF/OXFORD/key note Dated : 01/03/2019

1/03/2019

To,

Hon'ble Chancellor

RKDF University

Bhopal

Sub: Visit to International Conference on Solar Thermal OXFORD UNIVERSITY, UK from March 11, 2019 – March 18, 2019.

Madam,

I have been invited to present a paper in International Conference on Solar Thermal (ICEEE) at OXFORD UNIVERSITY, UK from March 11, 2019 – March 18, 2019. A copy of invitation as key note speaker and my PPT are attached

Kindly provide me duty leave. I will bear my International / Local travel and other expenses.

Dr. V K Sethi 01/03/2019

VC

Vice Chancellor
RKDF
BHOPAL (M.P.)

Registrar
RKDF University

Dr. (Mrs) Sadhna Kumari
MBBS, PGDBM
Chancellor

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RKDF UNIVERSITY

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No. 220 /RKDF/ 2019 Dated : 01 /03/2019

To,

Dr. V.K. Sethi

Vice Chancellor

RKDF University, Gandhi Nagar

Bhopal, M.P 462033

Subject : Visit to International Conference on Solar Thermal OXFORD UNIVERSITY, UK from March 11, 2019- March 18, 2019

Reference : Your office letter No. VC/RKDF/OXFORD/KeyNote Dated 01-03-2019

Dear Dr. Sethi

With reference to your letter dated 1st March 2019, the University is pleased to permit you to visit **International Conference on Solar Thermal Oxford University, UK** to present a paper in **International Conference on Solar Thermal (ICEEE) at Oxford University, UK** from ***March 11, 2019- March 18, 2019***. You will be considered on **Official Duty leave** on the above dates and also days required for Pre and Post Journey period. Please submit a detailed report of the visit for further University records.

Best wishes

(Dr. Sadhna Kapoor)

CHANCELLOR
RKDF UNIVERSITY
BHOPAL

Copy forwarded for information & necessary action to:

(1) Registrar, RKDF University, Bhopal

(2) CAFO, RKDF University, Bhopal

Registrar
RKDF University