പതിനാലാം കേരള നിയമസഭ
പതിമൂന്നാം സമ്മേളനം

നക്ഷത്രചിഹ്നമിടാത്ത ചോദ്യം നം.2579 06.12.2018 ൽ മറുപടിയ്ക്ക്

അനെർട്ട് സി-ഡാക്ക് എന്ന സ്ഥാപനങ്ങളുമായി ഉണ്ടാക്കിയിട്ടുള്ള കരാറുകൾ

ചോദ്യം		ഉത്തരം	
ശ്രീ. എം. വിൻസെന്റ്		ശ്രീ. എം. എം. മണി (വൈദ്യുതി വകുപ്പ മന്ത്രി)	
(എ)	അനെർട്ട്, സി-ഡാക്ക് എന്ന സ്ഥാപനങ്ങളുമായി ഏതെല്ലാം പദ്ധതികളിൽ കരാർ ഉണ്ടാക്കിയിട്ടുണ്ട്; കരാറിന്റെ പകർപ്പ് ലഭ്യമാക്കാമോ;	(എ)	(1) ഇടുക്കി ജില്ലയിൽ രാമക്കൽമേട്ടിൽ അനെർട്ടിന് റവന്യൂ വകുപ്പിൽ നിന്നും ലഭിച്ച ഭൂമിയിൽ നൂതന സാങ്കേതിക വിദ്യകൾ സ്ഥാപിക്കുകയും പരിചയപ്പെടുത്തുകയും ചെയ്യുന്നതിലേക്ക് ഭരണാനുമതി ലഭിച്ചിരുന്നു. ആദ്യ ഘട്ടമായി സോളാർ വിൻഡ് ഹൈബ്രിഡ് പവർ പ്ലാന്റ് സ്ഥാപിക്കുവാനാണ് ഉദ്ദേശിക്കുന്നത്. അതിൽ 1 മെഗാവാട്ട് സോളാർ പവർ പ്ലാന്റാണ് ഈ വർഷം നടപ്പാക്കുന്നത്. കേന്ദ്ര സർക്കാർ സ്ഥാപനമായ സി-ഡാക്, കേരള സർക്കാർ സ്ഥാപനമായ കെൽട്രോൺ എന്നീ സ്ഥാപനങ്ങളുമായി ചേർന്നാണ് പദ്ധതിയുടെ ആദ്യ ഘട്ടം നടപ്പിലാക്കുന്നത്. അവരുമായി ഏർപ്പെട്ട കരാറിന്റെ പകർപ്പ് അനുബന്ധം-1 ആയി ഉള്ളടക്കം ചെയ്യുന്നു. (2). ബാറ്ററി ഇന്റർവെൻഷൻ പവർ സപ്ലൈ അഥവാ ബാറ്ററി ഉൾക്കൊള്ളിച്ചുള്ള പ്രത്യേക ഗ്രിഡ് ബന്ധിത സോളാർ ഇൻവെർട്ടർ എന്ന പദ്ധതിക്കായി അനെർട്ടും സി-ഡാകും ചേർന്ന് കരാറിൽ ഏർപ്പെട്ടിട്ടുണ്ട്. ടി കരാറിന്റെ പകർപ്പ് അനുബന്ധം-2 ആയി ഉള്ളടക്കം ചെയ്യുന്നു.
(ബി)	പ്രസ്തുത പദ്ധതികളുടെ കരാർ കാലാവധി എന്നാണ് അവസാനിപ്പിച്ചിട്ടുള്ളത്; എന്ത് തുക ഇതുവരെ നൽകി; തുക നൽകിയതിന്റെ ഉത്തരവുകളുടെ പകർപ്പ് ലഭ്യമാക്കുമോ; പദ്ധതികളുടെയും പ്രോജക്ടിന്റെയും ഇപ്പോഴത്തെ സ്ഥിതി വിശദീകരിക്കാമോ;	(ബി)	**(1). ഹൈബ്രിഡ് പവർ പ്ലാന്റ്** ആദ്യ ഘട്ടത്തിലെ സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിന്റെ കരാർ ഉടമ്പടിയിൽ ഒപ്പുവച്ചത് 2017 ഒക്ടോബർ 19 ാം തീയതിയാണ്, എന്നാൽ കരാർ കാലാവധി തുടങ്ങുന്നത് കരാർ തുകയുടെ 30% അഡ്വാൻസ് ലഭ്യമാക്കുന്ന തീയതി മുതലാണ്. ഇതിനായി കരാർ തുകയുടെ 30%-മായ 5,21,32,500/- രൂപ നല്കികൊണ്ടുള്ള 13/12/2017-ലെ എ.എഫ്. 890/R&D/ANERT/2017 നമ്പർ ഉത്തരവു പ്രകാരം അനുവദിച്ചിരുന്നെങ്കിലും (അനുബന്ധം 3) ട്രഷറി നിയന്ത്രണം നിലനിന്നതിനാൽ 2018 മാർച്ച്

			മാസം മാത്രമാണ് ഇക നൽകിയത്. ഇത പദ്ധതിയുടെ പ്രവർത്തനങ്ങൾ വൈകുവാൻ ഇടയാക്കി. കൂടാതെ അനെർട്ടിന് അനുവദിച്ച ഭൂമിയുമായി ബന്ധപെട്ട് തർക്കങ്ങൾ ഉയരുകയും ഉടുമ്പഞ്ചോല തഹസ്സിൽദാരുടെ നേതൃത്വത്തിൽ റീ സർവ്വേ നടപ്പടികൾ പൂർത്തിയാക്കുകയും ചെയ്യേണ്ടതായി വന്നു. ഇതിനു പുറമേ പ്രതികൂല കാലാവസ്ഥയെ തുടർന്ന് സ്ഥലത്ത് എത്തി ചേരുവാനുള്ള ബുദ്ധിമുട്ടുകളും ഉണ്ടായിരുന്നു. നിലവിൽ പവർ പ്ലാന്റിന്റെ ഫൗണ്ടേഷൻ ജോലികളും കൺട്രോൾ റൂമിന്റെ നിർമ്മാണവും പുരോഗമിക്കുന്നു. ഇക നൽകിയ ഉത്തരവിന്റെ പകർപ്പ് അനുബന്ധം-3 ആയി ഉള്ളടക്കം ചെയ്യുന്നു. റീ സർവ്വേ നടപടികൾ പൂർത്തിയാക്കി നിർമ്മാണം പുനരാരംഭിച്ച ഭൂമിയിന്മേൽ വീണ്ടും ഉടമസ്ഥാവകാശ തർക്കം ഉണ്ടാവുകയും നിർമ്മാണം തടസ്സപ്പെടുന്ന സാഹചര്യവുമാണ് നിലവിലുള്ളത്. ഉടുമ്പൻചോല പോലീസ് സ്റ്റേഷനിൽ ഇത സംബന്ധിച്ച് പരാതി നൽകുകയും, ഇടുക്കി ജില്ലാ കളക്ടർ, ജില്ലാ പോലീസ് മേധാവി എന്നിവരുടെ അടിയന്തര ഇടപെടൽ ഉണ്ടാകണമെന്ന് കാണിച്ച് കത്ത നൽകുകയും ചെയ്തിട്ടുണ്ട്. **(2). ബാറ്ററി ഇന്റർവെൻഷൻ പവർ സപ്ലൈ അഥവാ ബാറ്ററി ഉൾക്കൊള്ളിച്ചുള്ള പ്രത്യേക ഗ്രിഡ് ബന്ധിത സോളാർ ഇൻവെർട്ടർ.** ബാറ്ററി ഇന്റർവെൻഷൻ പവർ സപ്ലൈ അഥവാ ബാറ്ററി ഉൾക്കൊള്ളിച്ചുള്ള പ്രത്യേക ഗ്രിഡ് ബന്ധിത സോളാർ ഇൻവെർട്ടർ വികസിപ്പിക്കുക എന്നതാണ് ഈ പദ്ധതികൊണ്ട് ഉദ്ദേശിക്കുന്നത്. കരാർ പ്രകാരം 2018 ഡിസംബർ വരെ പ്രസ്തുത പദ്ധതിക്ക് കാലാവധിയുണ്ട്. 14.95 ലക്ഷം രൂപ സി-ഡാക്കിന് നൽകി. ഇക നൽകിയ ഉത്തരവിന്റെ പകർപ്പ് അനുബന്ധം-4 ആയി ഉള്ളടക്കം ചെയ്യുന്നു. പദ്ധതി 85% പൂർത്തിയായിട്ടുണ്ട്.
(സി)	കെൽട്രോണുമായി ഏതെല്ലാം പദ്ധതികളിൽ കരാർ ഉണ്ടാക്കിയിട്ടുണ്ട്; കരാറിന്റെ പകർപ്പ് ലഭ്യമാക്കുമോ; ഇക നൽകിയതിന്റെ ഉത്തരവുകളുടെ പകർപ്പ് ലഭ്യമാക്കുമോ; സി.എം.ഡി.മുഖേന താൽക്കാലിക നിയമനം ലഭിച്ച ജീവനക്കാർക്ക്	(സി)	കെൽട്രോൺ (ഐ.റ്റി. ബിസിനസ് ഗ്രൂപ്പ്) മുഖാന്തരം ഇലക്ട്രോണിക് മാർക്കറ്റ് പ്ലേസ് (www.buymysun.com), അനെർട്ടിന്റെ പ്രോഗ്രാം മാനേജ്മെന്റ് സിസ്റ്റം (PMS), കസ്റ്റമർ റിലേഷൻ മാനേജ്മെന്റ് (CRM) എന്നീ പോർട്ടലുകൾ വികസിപ്പിക്കുന്നതിന് കരാറിലേർപ്പെട്ടിട്ടുണ്ട്. കരാറുകളുടെയും ഇക നൽകിയ ഉത്തരവുകളുടെയും പകർപ്പ് അനുബന്ധം-5 ആയി ഉള്ളടക്കം ചെയ്യുന്നു.

	ശമ്പളം കൊടുക്കുന്നത് ഏത് സ്ഥാപനം മുഖേനയാണ്;		അനെർട്ടിൽ സി.എം.ഡി. മുഖേന താൽക്കാലിക നിയമനം ലഭിച്ച ജീവനക്കാർക്ക് ശമ്പളം കൊടുക്കുന്നത് അനെർട്ട് ആണ്.
(ഡി)	സി.എം.ഡി. മുഖേന താൽക്കാലിക നിയമനം ലഭിച്ച എത്ര ജീവനക്കാർ എത്ര പ്രാവശ്യം വിമാന മാർഗ്ഗം, എവിടെയെല്ലാം എത്ര പ്രാവശ്യം യാത്ര ചെയ്തിട്ടുണ്ട്; ഇവരുടെ പേരും തസ്തികയും ചെലവായ തുകയും പട്ടിക തിരിച്ച് ലഭ്യമാക്കുമോ; ഈ യാത്രയ്ക്ക് സർക്കാർ അനുമതി ലഭിച്ചിട്ടുണ്ടോ; ആയതിന്റെ പകർപ്പ് ലഭ്യമാക്കുമോ?	(ഡി)	സി.എം.ഡി. മുഖേന അനെർട്ടിൽ റിസർച്ച് ഫെല്ലോ ആയി താൽക്കാലിക നിയമനം ലഭിച്ച ശ്രീ. പി. വിനയ് എന്ന ജീവനക്കാരൻ ഔദ്യോഗിക ആവശ്യത്തിലേയ്ക്കായി തിരുവനന്തപുരത്ത് നിന്നും ന്യൂഡൽഹിയിലേയ്ക്കും അതു പോലെ തന്നെ തിരികെയും ഒരു തവണ വിമാന മാർഗ്ഗം യാത്ര ചെയ്തിട്ടുണ്ട്. ചെലവായ തുക 22,433/- രൂപ. 13/08/2018 ലെ ജി.ഒ(ആർ.ടി) നം.150/2018/ഊ.വ പ്രകാരം ഈ യാത്രയ്ക്ക് സർക്കാർ അനുമതി നൽകിയിട്ടുണ്ട്. ടി സർക്കാർ ഉത്തരവിന്റെ പകർപ്പ് അനുബന്ധം-6 ആയി ഉള്ളടക്കം ചെയ്യുന്നു.

സെക്ഷൻ ഓഫീസർ

Annexure-1

അനുബന്ധം-1

കേരളം केरल KERALA BT 162083

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement is made and executed on this day 19th October, Two Thousand and Seventeen.

BETWEEN

Centre for Development of Advanced Computing, Vellayambalam, Thiruvananthapuram - 695 033, a constituent Unit of CDAC, a Scientific Society of the Ministry of Electronics and Information Technology, Government of India, registered under the Societies Registration Act of 1860, having its registered office at Pune, (hereinafter referred to as "**CDAC(T)**", which expression shall, unless it be repugnant to or inconsistent with subject or context thereof, include and be deemed to include their heirs, executors, successors or administrators and assigns) on the **FIRST PART**

AND

ANERT, PMG - Law College Road, Vikas Bhavan P.O., Thiruvananthapuram – 695 033, (hereinafter referred to as "**ANERT**" which expression shall, unless it be repugnant to or inconsistent with subject or context thereof, include and be deemed to include their heirs, executors, successors or administrators and assigns) on the **SECOND PART**

AND

Kerala State Electronics Development Corporation Limited (KELTRON), Corporate Office, Keltron House, Vellayambalam, Trivandrum 695 033 (hereinafter referred to as "**KELTRON**" which expression shall, unless it be repugnant to or inconsistent with

S. Sobhanakumari 17-10-17

DIRECTOR ANERT

SASTHAMANGALAM VENDOR S. SOBHANAKUMARI

19 OCT 2017

subject or context thereof, include and be deemed to include their heirs, executors, successors of administrators and assigns) on the THIRD PART

Hereinafter collectively referred to as the "Parties" or individually as the "Party"

WHEREAS ANERT is an agency under government of Kerala actively involved in dissemination and related R&D works of new and renewable energy sources.

WHEREAS CDAC (T) has strong team for Power Electronics R&D and has developed various systems for renewable energy conversion using Power Electronics technology.

WHEREAS KELTRON is a Public Sector Enterprise owned by the Government of Kerala and is managed by a Board of Directors and is a multi-product organisation producing a wide range of products from discrete electronics components to complex equipment and systems

WHEREAS ANERT has initiated development of a hybrid renewable energy power plant using renewable energy sources and battery storage. This development activity aims at bringing out an operational technology demonstration platform in Kerala which can also be used for technology upgradation and experimentation in future. This activity is planned in a phased manner and in the first phase a 3 MW indigenous grid interactive solar photovoltaic power plant will be developed, deployed and demonstrated. CDAC (T) and KELTRON are identified as two potential technology partners for the implementation of the above grid interactive solar photovoltaic power plant.

WHEREAS CDAC (T), through various development projects executed, has acquired know how of an array of technology related to renewable energy power conversion and grid integration. CDAC (T) is capable of design and development of Power Conditioning Units (PCU) made with power electronic converters required for realizing the grid connected solar photovoltaic power plant. CDAC (T) can also execute the overall implementation of the proposed power plant.

WHEREAS KELTRON is a pioneering electronic system manufacturer in the region who has vast experience in manufacturing and deployment of complex industrial electronics system. The capability of KELTRON for manufacturing power electronic converter systems will be utilized to bring out engineered and optimized PCUs based on CDAC (T)'s design for realizing the power plant. Moreover KELTRON has got a good network for system operation and maintenance which will be useful in the sustenance of the indigenous solar photovoltaic power plant proposed to be developed and deployed under this MoA.

ANERT and CDAC(T) has agreed to undertake a joint project aiming indigenous development and deployment of a 3 MW grid interactive solar photovoltaic power plant which will be funded by ANERT as per the terms and conditions detailed below. This activity will be executed with fabrication, testing and commissioning support from KELTRON.

DIRECTOR
ANERT

1.0. SCOPE OF THE MoA

The scope of work as per MoA is to develop, deploy and demonstrate an indigenous 3 MW grid interactive solar photovoltaic power plant with technical features as described in Annexure 1. The suitable deployment locations will be identified and provided by ANERT.

The scope of the development and deployment project will also involve

- Development and deployment of grid connected solar photovoltaic power plant having PCUs with advanced features suited for Indian Grid conditions using economical and reliable solar PV module technology available in the market
- Development and deployment of PCUs as test and evaluation platform for different solar PV cell technology, namely poly crystalline, mono crystalline and thin film
- Development and deployment of PCUs as test and evaluation platform solar PV auto tracking system
- Establish a remote monitoring and data acquisition system and preserve the generation data for further studies

The activities covered and the responsibility sharing covered under the MoA is tabulated below

Sl. No	Activity	Agencies responsible
1.	Preparation of specification	CDAC(T)
2.	Finalisation of specification	CDAC(T) and ANERT
3.	Preliminary design of the power plant and subsystems	CDAC(T) in consultation with ANERT
4.	Detailed design of the power plant and subsystem	CDAC(T) in consultation with ANERT
5.	Field preparations for deployment of the power plant	ANERT and CDAC(T) with the support of KELTRON
6.	Formal approvals for execution of the deployment and grid integration	ANERT
7.	Procurement and deployment of solar PV array	CDAC(T) with the support of ANERT and KELTRON
8.	Fabrication of PCUs for the power plant	KELTRON with the support of CDAC(T)
9.	Testing of the PCUs	CDAC(T) and KELTRON at KELTRON
10.	Transportation of the PCUs	KELTRON, CDAC(T)
11.	Extension of grid in coordination with KSEBL	ANERT with the support of CDAC(T)
12.	Erection and commissioning of the PCUs	CDAC(T), KELTRON and ANERT
13.	Field level testing	CDAC(T), ANERT and KELTRON
14.	Field trial and demonstration	CDAC(T) and ANERT
15.	Long term maintenance of the system	CDAC(T), KELTRON *(This will be based on an AMC*

DIRECTOR
ANERT

		agreement with ANERT based on mutually agreed terms and conditions)

The parties agree to fulfil the scope and responsibility on their part as listed above, and complete the project in **Twelve months'** time as per the schedule fixed, and to achieve the overall outcome of the product as per specifications given in Annexure–1.

KELTRON and CDAC(T) will collaborate for fabrication, testing, commissioning and long term maintenance of the system. This will be based on separate work order with mutually agreed terms and conditions between CDAC(T) and KELTRON. CDAC(T) will provide engineering drawings and technical information required for fabrication and implementation of the said power plant.

2.0 DELIVERABLES

Deliverable of the project is an operational 3 MW Grid Interactive Solar Photovoltaic Power Plant deployed at Ramakkalmedu. This will include experimental installation of various solar PV cell technology and solar PV tracker system for validation and demonstration.

CDAC (T) agrees to give the following intermediate deliverables to ANERT, as part of the development

- Designs, Schematic diagram and parts list associated with the power plant
- Fabrication drawings
- Overall system design documents

3.0 EFFECTIVE DATE

Date of start of the project is the date of receipt of the first instalment of Payment. The project duration is 12 months and project schedule is detailed in Annexure 1.

4.0 MONITORING OF THE PROJECT

The monitoring of the project shall be carried out by the Executive Committee of ANERT and a Monitoring Committee constituted by Government vide G.O. (Rt) No. 211/2017/POWER dated 12.6.2017.

5.0 ESTIMATED COST

Total budget outlay of this project is estimated to be ₹1655 Lakhs (Rupees One Thousand Six Hundred and Fifty Five Lakh only). Taxes and Levies as applicable will be extra.

6.0 PAYMENT TERMS

ANERT agrees to pay the development project fund, as per estimate in Annexure 1, to CDAC (T) in instalments linked to project milestones as tabulated below, against the certified requests from CDAC (T). The payment from Sl.no. 2 onwards will be subject to the recommendation of the Monitoring Committee referred at 4.0 above.

Sl.No	Instalment	Milestone
1.	30% of the project funds	On signing of the MoA
2.	30% of the project funds	On Supply and Installation of the first 1 MW power plant
3.	30% of the project funds	On Supply and Installation of the second 1 MW

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		power plant
4.	10% of the project funds	On Supply and Installation of the third 1 MW power plant and Successful commissioning and handing over of technical documents, system and final manuals.

Taxes and Levies as applicable will be extra.

7.0 CONFIDENTIALITY

CDAC (T) shall take reasonable steps to prevent ANERT's and KELTRON's knowhow, which are meant only for purpose of conducting the project, from unauthorised usage or falling into unauthorised hands. The same is applicable to ANERT and KELTRON also.

8.0 INTELLECTUAL PROPERTY RIGHTS

The IPR including design information, designs and data generated through the project, circuits, drawings, concepts etc. shall be held jointly by CDAC(T) and ANERT. CDAC(T) shall continue to own and utilize its pre-existing IP in this area for its technology development activities.

ANERT is free to carry out on their own, any modifications / refinements in the design for attaining a good commercial value. These modifications/ refinements shall remain the intellectual property of ANERT.

9.0 COMMERCIALISATION

ANERT can execute transfer of technology to third party for commercialization and the income generated by technology transfer and royalty will be shared between CDAC(T) and ANERT based on mutually agreed terms and conditions.

10.0 VALIDITY

Validity of this Agreement is for 5 years from the date of signing of this MoA.

11.0 AMENDMENT

This agreement shall be the sole repository of the terms agreed to between the parties and no amendment thereof shall take effect and be binding unless such amendment is recorded in writing and signed by the authorised representatives of the three parties.

12.0 TERMINATION

All the parties have the right to terminate this MoA by giving a prior notice of not less than 2 months

13.0 SERVABILITY

If any part of this agreement is found by a court of competent jurisdiction or other competent authority to be invalid, unlawful or unenforceable, then such part will be severed from the remainder of this agreement, which will continue to be valid and enforceable to the fullest extent permitted by law.

14.0 ARBITRATION

In the event of a dispute or a difference of any nature whatsoever between the Parties during the course of performance of respective obligations arising out of this MoA, the

DIRECTOR
ANERT

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Parties agree to refer the matter to the Heads of the Institutions to resolve the disputes keeping in view the best interest of the parties and in keeping with the spirit of performance of this MoA. If the matter still remains unresolved, the same shall be referred to the arbitration of two arbitrators, one to be appointed by each party to the dispute, and in case of difference of opinion between them still persists, the disputed matter shall be referred to an umpire, appointed by the said two arbitrators before entering on the reference and the decision of such arbitrators or umpire, as the case may be, shall be final and binding on all the parties. The venue of arbitration shall be at Thiruvananthapuram and the arbitration proceedings shall take place under the Indian Arbitration and Conciliation Act, 1996 with its amendments from time to time.

15.0 JURISDICTION

The parties to this agreement hereby declare that the Courts in Thiruvananthapuram alone are competent to deal with disputes, if any, arising out of this agreement.

16.0 FORCE MAJEURE

Neither party shall be liable to the other for any delay or failure on their part in performing any of their obligations under this agreement, resulting from any cause beyond their control including, but not limited to strikes, fires, floods, earthquakes, explosions, riots, acts of God, acts of Governments, war, enemy action or political changes, etc.

17.0 COMMUNICATION

Any notice, request, demand, approval, consent or other communications provided or permitted hereunder shall be in writing and given by personal delivery or sent by registered post or by ordinary mail, postage prepaid, or by fax/email addressed to the party for which it is intended at its following address

CDAC(T)	ANERT	KELTRON
Aby Joseph Joint Director Power Electronics Group CDAC Vellayambalam Thiruvananthapuram – 695 033	Premkumar Scientist ANERT Vikas Bhavan P.O Thiruvananthapuram 695 033	Viju Jacob General Manager PEG, KEC KELTRON Thiruvananthapuram 695 033

DIRECTOR
ANERT

In acceptance to the above, we herewith append our signatures below on this day 19th October, Two Thousand and Seventeen.

For and on behalf of ANERT	For and on behalf of CDAC(T)	For and on behalf of KELTRON
	Ramani B	
Dr. R. Hari Kumar	Sri. B. Ramani	S. Suresh Kumar
Director, ANERT, Vikas Bhavan P.O., Thiruvananthapuram-695033	Executive Director, CDAC, Vellayambalam, Thiruvananthapuram-695 033	Chief General Manager, KEC, KELTRON, Thiruvananthapuram-695 564
Witness:	Witness:	Witness:
1. K. Premkumar ANERT 2. C.K. Chandrabose ANERT.	1. R. Sudeep Kumar CDAC(T) 2. Suresh Babu. V.S. PEM, CDAC.	M.S. Venkateswara Rao Dam, Corp. mktg/KEL Rajmohan N Asst Mgr, KEL

AGENCY FOR NON-CONVENTIONAL ENERGY & RURAL TECHNOLOGY ANERT TVM

CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING GOVT OF INDIA VELLAYAMBALAM TRIVANDRUM

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LTD. TRIVANDRUM 695 564.

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Annexure I.

Development and Deployment of 3 MW Indigenous Solar Photovoltaic Power Plant at Ramakkalmedu

1. Background

Solar power in India is a fast growing industry. As of 30 June 2017, the country's solar grid had a cumulative capacity of 13.11 GW. In January 2015 the Indian government expanded its solar plans, targeting US$100 billion in investment and 100 GW of solar capacity (including 40 GW from rooftop solar) by 2022. In addition to its large-scale grid-connected solar PV initiative, India is developing off-grid solar power for local energy needs to tackle the issue of poor rural electrification rate. Wind power generation capacity in India has significantly increased in recent years. As of the end of March 2017 the total installed wind power capacity was 32.17 GW, mainly spread across the South, West and North regions. Environmentally friendly power generation technologies will play an important role in future power supply. The renewable energy technologies include power generation from renewable energy sources, such as wind, PV(photovoltaic), MH(micro hydro), biomass, ocean wave, geothermal and tides. However, all renewable energy sources rely entirely on one thing to behave: 'The Weather'. Hydro-generators need rain to fill up dams to supply flowing water. Wind turbines need wind to turn the blades. Solar collectors need clear skies and sunshine to collect heat and make electricity. Variability and random behaviour mark the main characteristics of renewable energy sources (RES). Nevertheless, there is certain regularity and cyclic recurrence in their behaviour. The intensity of the different energy sources into time is not the same. In general, when one of the sources is intensive, the other tends to be extensive, i.e. the sources complement one another. The distribution into time and the intensity of the energy sources depend on the meteorological conditions of the chosen area, on the season etc.

Hybrid systems can address limitations in terms of fuel flexibility, efficiency, reliability, issues related to emissions etc. Hybrid Renewable Energy System (HRES) combines two or more renewable energy resources with some conventional source (diesel or petrol generator) along with storage, in order to fulfil the demand of an area. Hybrid renewable energy systems (HRES) are becoming popular as stand-alone power systems for providing electricity in remote areas due to advances in renewable energy technologies and subsequent rise in prices of petroleum products.

2. Grid Tied Hybrid Renewable Energy Systems

The variability of the energy sources is one of the most challenging issue of grid connected solar photo voltaic and wind energy systems. The variability of wind and solar generation in a day is given in Fig1. The availability of the grid is also a matter of concern in the case of grid interactive power plants. By combining wind and solar generation at a single point the power generation can be stabilized as given in Fig 2. By combining energy storage system of adequate capacity, a hybrid renewable energy station can be made despatchable so that the system operator can rely on the power plant.

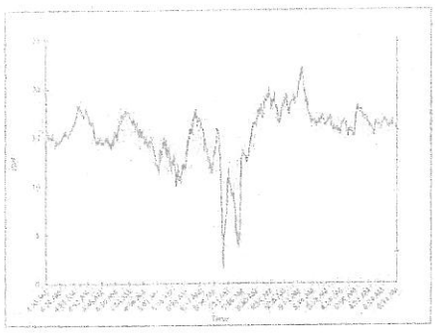


Fig 1a. Intermittency in wind energy generation

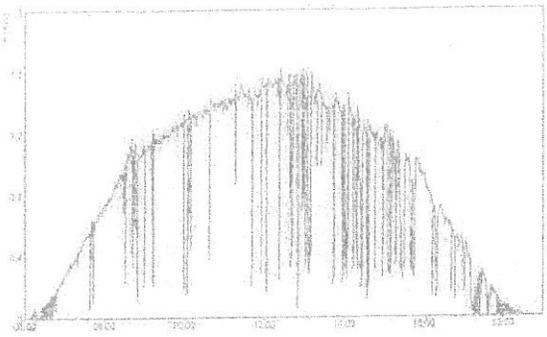


Fig 1b. Intermittency in solar energy generation

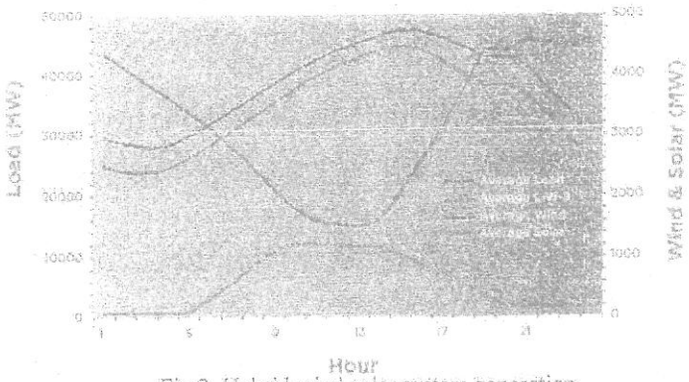


Fig 2. Hybrid wind solar system generation

Scheme proposed by CDAC(T) for ANERT to build a hybrid renewable energy power plant is depicted in Fig 3. It incorporates 3 MW grid connected solar photovoltaic power plant and 4 MW wind electric power generation at a potential site of ANERT with sufficient storage facility so that the hybrid power plant can work reliably as a despatchable distributed energy generator.

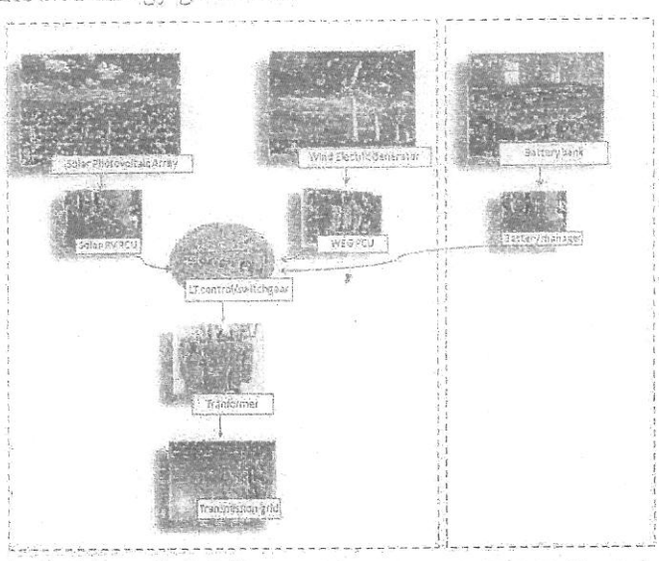


Fig 3. Scheme for hybrid renewable energy power plant with storage

Advantages of the hybrid renewable energy power plant are

- Green energy source
- The variability of solar and wind generation will get complemented each other making the generation more stable

- Seasonal variations are offset
- The battery can be used to control the power ramp rate to smoothen the power export to grid
- Energy shifting control can be implemented with battery so that the characteristics of a despatchable power plant can be achieved
- Redundancy and reliability can be achieved with battery storage
- Power plants can be at point of use
- Suitable for village power supplies, commercial power parks, industrial power supply etc.
- Grid support for voltage stability and power quality

The legacy power plants with rotary generators are highly stable and time tested. The hybrid power plant proposed is realized using power electronic converters. The converters needs to maintain the reliability of conventional power generators. The proposed hybrid power station will be realized in three phases as listed below

- Implementation of a 3MW rated indigenous grid connected solar photovoltaic power plant suitable for hybrid generation
- Implementation and integration of an indigenously developed grid scale battery storage system with energy management control suitable for hybrid power plants
- Integration of a wind electric generation system with a rating of 4 MW in the hybrid power plant

The site identified for the development is Ramakkalmedu in Idukki district where the wind potential is estimated as highest in Kerala and solar irradiation is also sufficient for deployment of grid connected power plant.

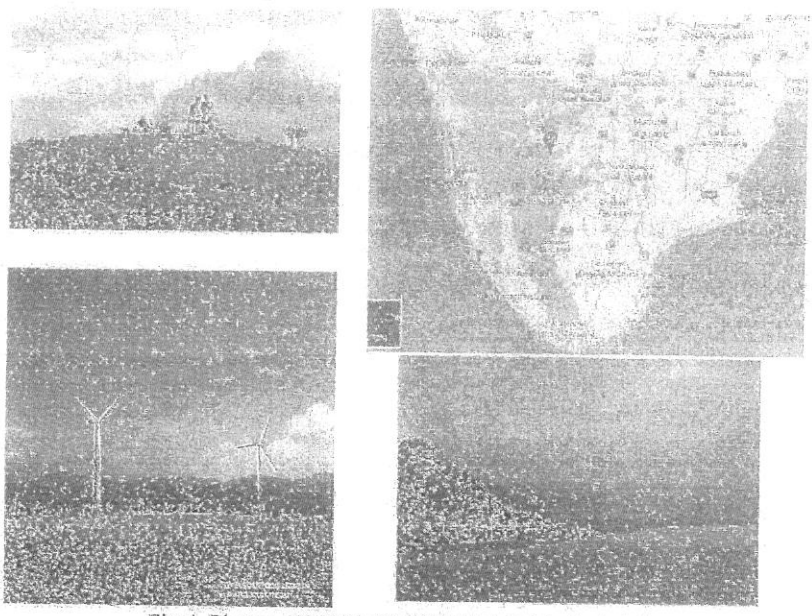


Fig 4. Photos- Ramakkalmedu(proposed project site)

The proposed development will be a unique station with following features

- Indigenously developed power converters and control mechanism for solar and battery management

- Indigenously developed supervisory energy management scheme for hybrid operation
- Demonstration platform for hybrid renewable energy technology
- Testing and validation platform for various solar panel technology
- Testing and validation platform for various battery technology
- Experimental station for future upgradations and enhancements for smartgrid requirement

Development of 3 MW grid interactive solar photovoltaic power plants will be initiated first as part of the development of the hybrid power plant. This part of the development is detailed in the following sections.

3. Grid Interactive Solar Photovoltaic Power Plant

Out of many Renewable Energy technologies accepted by the global Renewable Energy Community, Solar Energy is sustainable, and will be available for long. India has very large scope for utilising solar irradiation for its energy needs. Rajasthan and northern Gujarat are places with highest annual global radiation. In the above regions large areas of land are barren and sparsely populated, making these areas suitable as locations for large central solar power stations. The Indian government has launched Jawaharlal Nehru National Solar Mission (JNNSM) with a target of achieving 20000 MW of installed capacity by 2022. The goal is to make India one of the leaders in solar energy. The above program will involve large deployment of photo voltaic power plants all over India. Large grid connected power plants with indigenous technology will be an attractive idea due to many reasons including operation, maintenance and sustainability. The indigenous technology should be competent with regard to various technical features and should be designed to cop up with Indian grid and weather conditions. As the number and capacity of the grid connected power plants are increasing the challenges in maintaining the operational security, stability and power quality of the utility grid are also increasing.

3.1. Aim of the development

The project aims at study of system requirements, design, implementation, commissioning and field trial of power conversion system for futuristic grid connected solar photovoltaic power plant with a cumulative rating of 3 MW. The system will have improved features making it reliable and economical technology for Indian Grid Conditions. The development will aim at improving and achieving the following features

- Capability to ride through faulty and disturbed grid conditions
- Grid support for power quality
- Fast control of active and reactive power exchange
- Competent Efficiency and performance ratio
- Better Reliability
- Modularity and Maintainability
- Operational redundancy
- State of the art system protections
- Communication features and controllability for smartgrid integration

The scope of the development and deployment project will also involve

- Development and deployment of Power Conditioning Units with advanced features with economical and reliable solar PV modules available in the market
- Development and deployment of PCUs as test and evaluation platform for different solar PV cell technology, namely poly crystalline, mono crystalline and thin film
- Development and deployment of PCUs as test and evaluation platform for solar PV auto tracking system

3.2. Scheme of grid interactive solar photovoltaic power plant

The basic scheme for grid connected solar photovoltaic power plant is given in Fig.5. The major building blocks associated with the system are the solar PV array, the Power Conditioning Unit(PCU) and the inter-connecting transformers, if isolation is required. The DC current generated by the PV array is converted into ac current, matched in frequency and phase with grid is then pumped to the grid. The major building blocks of the PCU are the solar inverter and the filter circuits. Various hardware configurations are used to realize the PCU. In the proposed power levels (3 MW), 3-Phase Voltage Source Inverter with higher order filter can be efficiently used.

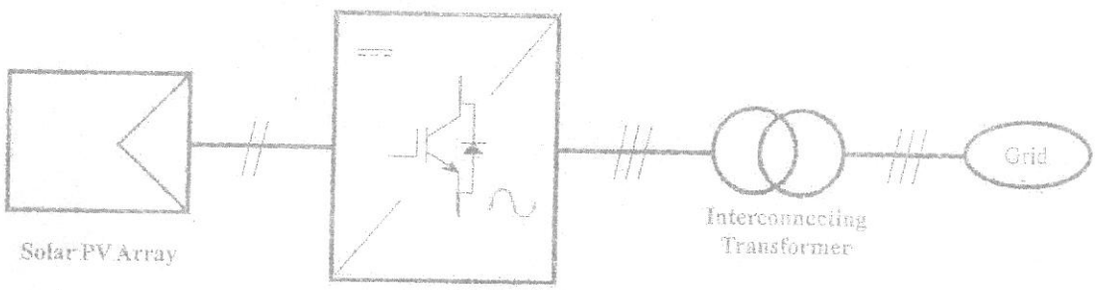


Fig 5. Grid connected Solar PV system

The transformer in the above scheme is used for voltage matching and isolation. The transformer will also filter-out DC components in the currents injected by the PCU on to grid. The major building blocks of the grid connected solar photovoltaic power plant are shown in Fig 6 below.

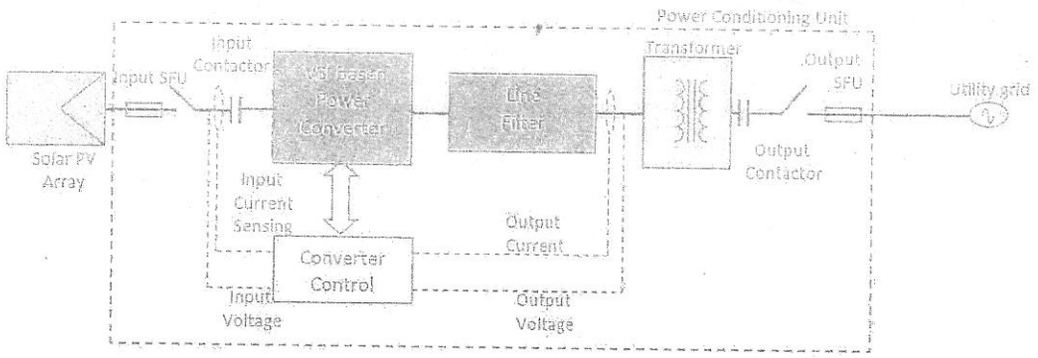


Fig6 Single line Diagram of Grid connected SPV system

The major components of the systems are

- Solar Photovoltaic Array
- Voltage Source Inverter
- Line Filter and transformer
- DC bus Capacitor
- Switchgear
- Sensors
- Controller platform

4. Technical features addressed in the proposed development

The proposal basically aims at enhancing the general grid interactive inverter for solar photovoltaic systems to power conversion systems suitable for Indian Grid conditions. This is realised by upgradation of both hardware and control methodology. Moreover, the system will be developed in such a way that it can be transformed into a hybrid power plant seamlessly. The following sections describe how various improved features will be achieved for the proposed power conversion systems.

4.1 Solar PV technology

The proposed grid interactive system will be a demonstration and experimentation platform for various solar PV technology. There are many different types of solar cells. However, the most common and commercially available types are amorphous, polycrystalline, and mono crystalline cells; which derive their names from the nature of the silicon used to create their substrates. The conversion efficiency of a PV panel and its cost will depend on the nature of the silicon used to manufacture the panel's solar cells. Table1 shows various solar cell technology and their efficiency. In the proposed project PV modules with different cell technology will be used to demonstrate the operation efficiency and economics.

Many large scale PV plants being installed today have solar panels mounted on fixed structures, which leads to lesser generation as they are fixed only at a particular angle. To capture maximum solar insolation, a solar tracker system can be designed which changes its position automatically in accordance with the sun's movement. A PV solar tracker is a system that orients a Solar PV panel toward the sun. Trackers are used to minimize the angle of incidence between the incoming sunlight and a photovoltaic panel. This increases the amount of energy produced from a fixed amount of installed power generating capacity. Thus the primary benefit of a tracking system is to collect solar energy for the longest period of the day. Fig 7 shows typical comparison of fixed Vs horizontal single axis tracking system. The 'output power with a tracker' increases by 16% to 24% as against fixed tilt system depending on site location and array layout.

To improve generation and optimally use the land it thus becomes imperative to install trackers. The additional benefits reaped by installing trackers overweighs the incremental capex costs of tracker. Indian PV industry has seen a record low tariffs that are leading to IRR pressures for developers. Installation of trackers will help ease these pressures for the developer by improving the IRR by 2-3% over fixed tilt systems.

The most popular tracker systems used are:

Single Axis Solar Tracking System: These have one degree of freedom that acts as an axis of rotation thereby ensuring perpendicular incidence between the sun and the panels. The axis of rotation of single axis trackers is typically aligned along a true North meridian, and advanced tracking algorithms allow movement in any direction. Horizontal single axis tracker, and tilted single axis tracker are the most common variants of these trackers.

Dual Axis Solar Tracking System: These trackers have two degrees of freedom that act as axes of rotation. These axes are typically normal to one another. Dual axis trackers allow for optimum solar energy levels due to their ability to follow the sun vertically and horizontally. No matter where the sun is in the sky, dual axis trackers are able to angle themselves to be in direct contact with the sun.

Seasonal Tracker: These trackers provide flexibility of changing the orientation and tilt angle of the panel during various seasons. Often, these trackers are used for changing the angle every 4 months and help achieve 4% to 5% additional generation. However, the manual operation and the limitation of not being able to track the sun every day makes them an unattractive proposition.

Fig 7. Typical comparison of fixed Vs horizontal single axis tracking system

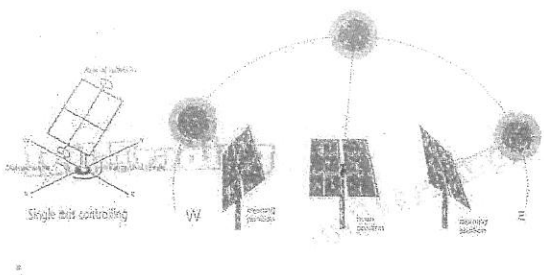


Fig 8a. Single axis solar tracker

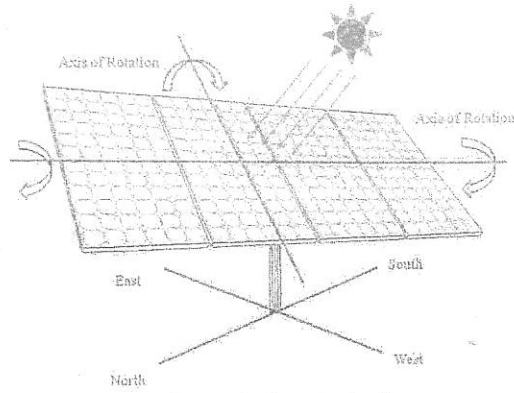


Fig 8b. Dual axis solar tracker

4.2 Ride through during grid side faults and disturbances:

IEEE1547-2003 and IEEE 929-2000 are the standards followed for interconnection of distributed resources to utility grid and utility interface for photovoltaic systems respectively. Both these standards follows disconnection of grid connected power plants in the event of input voltage excursions beyond limits (88% - 110%), frequency variations beyond limits, voltage unbalance conditions etc. In general the stipulations leads to anti-islanding protection. Moreover solar photovoltaic power plants are generally controlled for exporting power as defined by Maximum Power Point Tracking (MPPT) controller and export of real power is only managed by the power conversion system. In other words the power plant always operates at near unity power factor.

As the contribution of the renewable energy based power plants to the utility grid are increasing the paradigm shift in principles operation and control of such power plants is emerging. In grid conditions that are prevailing in India, the power plant should continue to get connected and operate during short term grid disturbances. If the large rated power plants stop power export and get disconnected during voltage notches or short term voltage disturbances, the grid will lose a large component of generation. After clearing the fault, when the grid becomes normal, the loads may get re-connected leading to insufficient generation followed by unstable operation and tripping of the grid. In such situations the power plant should be capable of fault ride through or Low Voltage Ride Through(LVRT).

Type of cell			Features	Efficiency
Silicon	Crystalline	Poly Crystalline	Instead of using a single crystal of silicon, manufacturers melt many fragments of silicon together to form the wafers for the panel.	18%
		Mone Crystalline	Consists of silicon in which the crystal lattice of the entire solid is continuous, unbroken to its edges, and free of any grain boundaries.	20%
	Thin Film	Amorphous Silicon(a-Si)	Non-crystalline form of silicon used for solar cells.	9%
Compound		Cadmium Telluride (CdTe)	A thin-film solar cell is a second generation solar cell that is made by depositing one or more thin layers, or thin film (TF) of photovoltaic material on a substrate, such as glass, plastic or metal.	12%
		Copper-Indium-Selenide (CIS)		12%
		Copper-Indium-Gallium-Selenide (CIGS)		12%
Organic	Dye sensitizer		Organic PV, or OPV, cells are composed of carbon-rich polymers and can be tailored to enhance a specific function of the cell, such as sensitivity to a certain type of light. This technology has the theoretical potential to	10%

	Organic thin film		provide electricity at a lower cost than silicon or thin-film technologies. OPV cells are only about half as efficient as crystalline silicon and have shorter operating lifetimes, but could be less expensive to manufacture in high volumes.	8%

Table 1. Different solar cell technology

Reactive power support will be incorporated in the control scheme for the power plant for

- Fault ride through
- LVRT in transient conditions
- LVRT in steady state condition
- Compensation during unbalance conditions

First control action during faults involving drop in grid voltage will be immediate reactive power support for the grid. This will be done if the fault occurs for period less than 150ms. If the grid does not regain normalcy within this period the system will be shutdown and disconnected as in anti-islanding protection. The condition for reactive power support is depicted in Fig 9.

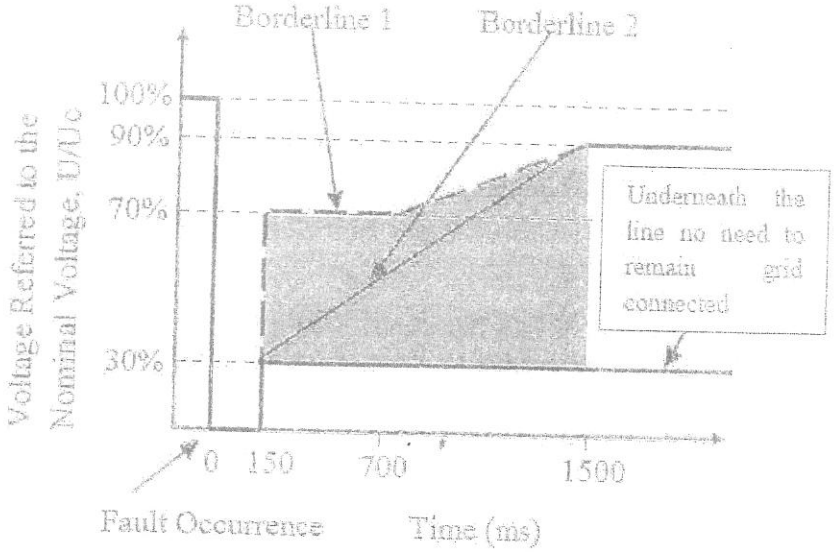


Fig 9. Condition for reactive power support during faults

Another control function which will be incorporated is reactive power exchange by the photovoltaic power plant for voltage support of the grid. This feature is very important in the case of weak grids. But when the power plant supports reactive power the operating power factor will not be unity. The rating of the inverter modules and all the other components of the power plant will be decided taking into account of the extra function of reactive power support. Presently it is estimated that the kVA is 125% of the kW capacity.

Transient MPPT

The MPPT algorithm is used to ensure maximum extraction of power for a given insolation level. The maximum power for given insolation will be a constant. Perturb and Observe (P&O) method is normally used for MPPT. This works well for normal power conversion scheme. During fault ride through or LVRT the power command for the power conversion system will be less than the output of MPPT. When the grid restores normal MPPT will be sluggish to bring the power level back to the MPP. In the proposed power conversion system a modified MPPT algorithm which handles transient power requirement will be incorporated.

Active Power control for frequency stabilising

MW level power should not be fed in or thrown off from grid instantaneously. A power ramp feature has to be provided for the power plant for smooth connection and disconnection. This indicates the ramp control of active power during start up and withdrawal. Moreover, like fault ride through and LVRT there will be instances where the power conversion system has to ride through frequency disturbances. This will be achieved by control of active power.

4.3 Grid Connected Inverter for better efficiency and reliability

Most of the solar inverter brands are giving a warranty of 5 years. This is comparatively less when compared to the warranted life of the PV array which may even go up to 30 years. In the present project the inverter design will be made to achieve better reliability and hence an improved MTBF. The development will focus on the following points to improve the efficiency and reliability

- Efficient Maximum Power Point Tracking scheme with intelligence to manage partial shading
- Control algorithm of the grid connected inverter to be modified and Discontinuous PWM techniques will be used to improve efficiency of the inverter by up to 3%
- Variable switching frequency based on power levels to reduce losses at higher power levels
- Sleep mode with reduced standby power(<0.25%)
- Optimum thermal design to keep the junction temperature of switching devices to provide life expectancy better than15 years
- Variable speed control for cooling fans to improve the overall efficiency
- Design of capacitor to achieve better reliability
- Forced air cooling with filtered air and panel design to avoid dust settlement
- Critical design of subsystems and auxiliary electronics circuit to achieve better reliability
- Over temperature protection
- Lightning and surge protection
- Instantaneous hardware over current and over voltage protections

- On-line diagnostics algorithm to find out the health of critical components in the power plant(Electrolytic capacitor, switching device and gate drive circuits)

The above developments will be carried out to achieve efficiency upto 97% and durability of 15 years for the PCUs.

4.4 Paralleling of inverters for better efficiency of operation and redundancy

Fig 10 shows a possible arrangement for realizing the grid connected solar photovoltaic power plant. Here n number of PCU sub modules are connected in parallel to achieve the proposed power capacity. This scheme of operation will help in

- Inverters working at optimum power level thereby improving the efficiency of the overall system even upto 5%
- Improved redundancy during faults either on inverter modules or the PV strings
- Effect of partial shading can be easily managed

The cost of the system can be optimized if the power level of paralleled individual inverter modules is kept below a threshold level.

4.5 Higher order filter for switching frequency attenuation

LCL filter connects the inverter to grid. LCL filter will attenuate the switching frequency components in the exported current better than L filter or LC filter. Moreover the volume of LCL filter is much less when compared to L filter or LCL filter. The major challenge in LCL filter is to realize active damping control using the filter capacitor current feedback. The overall control algorithm will ensure the harmonic performance of the power plant as stipulated by IEEE 1547-2003. LCL filter configuration will give improved EMI performance.

The inverters in parallel modules will be controlled with PWMs generated from interleaved carriers. This will reduce the ripple current in the system.

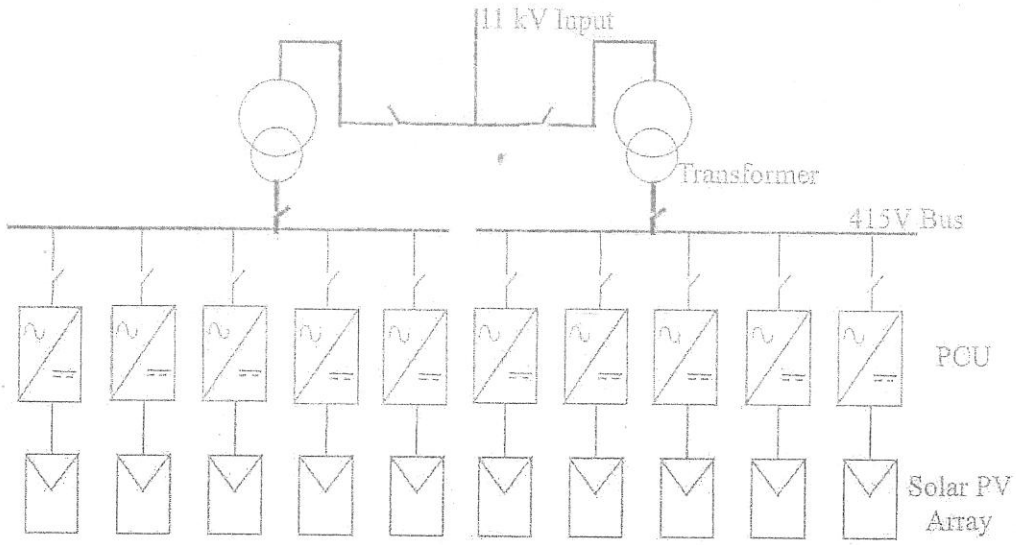


Fig10. Paralleled PV strings and PCUs

4.6. Capacitors and inductors

The DC bus capacitors and the AC filter capacitors will be selected judiciously to improve the reliability of the PCU. Diagnostic software routines will be monitoring the current in the filter inductors and the voltage ripple profile to estimate aging of these components so that servicing and replacement can be carried out before component failure. The inductors will be designed optimally using amorphous cores to reduce the losses. Similarly the transformers also will be designed to cause minimum losses.

4.7 Control Platform

The core of data processing and control platform will consist of Digital Signal Processor (preferably multi core) with suitable processing capability and peripherals as shown in Fig 11. The control platform has a mixed signal structure with signal conditioning circuits, fast ADCs, processors, communication peripherals and I/O ports. The memory capability for long term data logging will also provided. An accurate real time clock and battery backup memory will be provided in the hardware. To handle the computation requirement of certain algorithms that may come across, an FPGA will be used as a co-processor.

Facility for storage of data and events is another important functional requirement. Time stamped information will be saved in a local mass storage device or SD card. The time tags will be generated using a Real Time Clock.

Web server hardware will be integrated in the control platform to enable remote data logging and control. HMI will have keypad, graphics display, LED indications and alarm facility. Remote programmability also will be tried out. The HMI will be designed taking into account of the operational simplicity required.

The proposed scheme will have communication interface as an integral component. It comprises of various communication interfaces like

- Wired IP technologies – Ethernet
- USB for Mass Storage of Data

4.8 Protections

The PCU will have the following inherent protections. All the protection schemes are planned to improve the reliability of the system

- Input DC overvoltage protection
- Input over current protection
- Output over current protection
- Earth faults
- Grid side over voltage/under voltage protection
- Frequency error protection
- Protection during single phasing
- Over temperature protection for the converter
- Anti Islanding protection

Other than the above, system will have lightening and surge protection on the input side

4.9 Instrumentation

The system will have indicating and integrating type of meters both in the input side and output side of the system. More over there will be parameter display and data logging in

the PCU. The hardware and software support will be provided for remote data logging. All the major events will be saved with time tags from a Real Time Clock. Moreover bidirectional power meter will be provided on the grid side.

4.10 Modular Design

Another important feature of the hardware will be modular design. This is achieved as given below

- Power converter stacks having sandwich bus plate architecture integrating switching devices, heat sinks, cooling fans, capacitors and gate drive circuits
- Segregation of sensor modules, power supply modules, control module and filter modules to achieve modularity and maintainability

4.11 Standards

The recommendations of various standards associated with the renewable energy based power plants will be used as design inputs. Following are relevant standards which will be referred during design and development of the proposed power conversion system

- IEEE 928 – Recommended Criteria for terrestrial PV Power Systems
- IEEE 929-2000 - Operation, protection of the PV power plant
- IEEE 1547-2003 - Interconnection of the power plant to grid
- IEEE 519 - IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
- IEC 61215 -- Design qualification and type approval of crystalline Silicon PV modules

5. Specification

Nominal Power	3 MW
DC input Voltage	450- 800V DC
Grid Voltage	415 ± 20%, 3 Phase AC
Grid frequency	50 Hz ± 5%
Power Factor	>0.95 above 10% of installed capacity(Programmable) The system rating is chosen to supply reactive power[3]
I_{THD}	<5% , at full load as stipulated by IEEE 1547-2003
Efficiency	97%
Converter	IGBT based Voltage Source Inverter
Controller	DSP+FPGA based
Cooling	Forced air cooling with double filtering and fan speed control for enhancing the overall efficiency
Panel	Suitable for Indoor deployment
Data logging	Local memory storage, Remote data logging, time stamped data storage
User Interface	Graphic Display and keyboard, Remote access through Ethernet
Protections	Over/under voltage, Over current, Frequency error, Anti-islanding, string malfunctioning

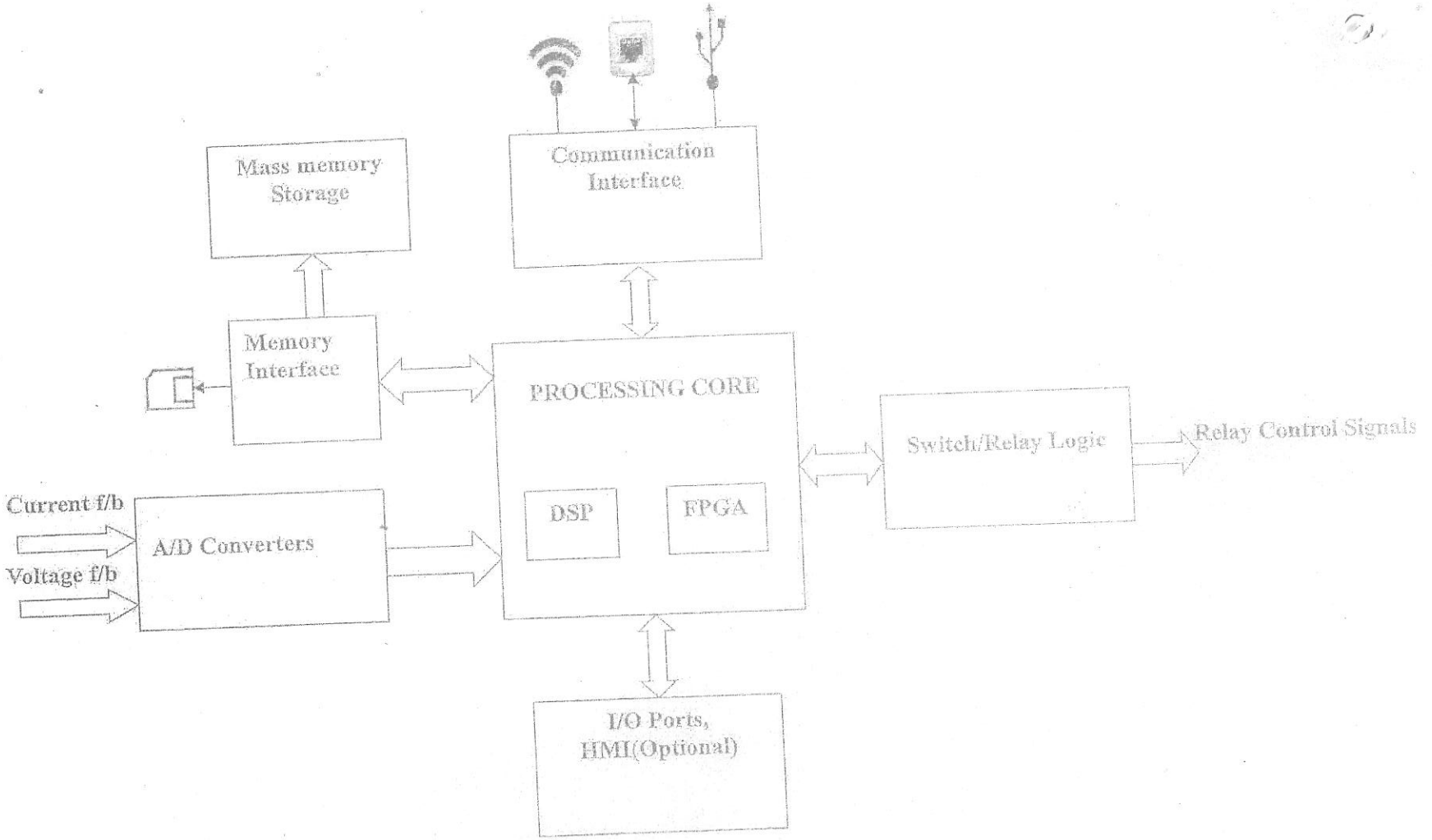


Fig 11. Block diagram of control and processing platform

6. Budgetary Details

Sl.No	Item		Budget(Rs. Lakhs)
1.	Consumable stores	Solar Panels with Mounting Structure (The cost of the Solar panels worked out at the rate of Rs. 25/- per Watt)	300.00
		Electrical subsystems including cabling and transformers	70.00
2.	Expenses associated with field preparations, construction of control room, approach road and electric grid connectivity		50.00
3.	Development, fabrication, testing and field deployment of 3 MW Power Conditioning Units		650.00
4.	Travel and training		15.00
5.	Contingencies		20.00
6.	Overheads		50.00
	Total		1655.00

The cost associated with the Solar PV array and subcontracted civil/electrical work at the field (Items Sl.No. 1 and Sl.No. 2 of Budget Estimate above) will be finalised based on the cost arrived at through tenders.

7. **Major milestones of the project**

- System specification
- Finalisation of field trial location
- Plan for control room, array structufe, cabling and grid connectivity
- Design of grid interactive solar photovoltaic power plant
- Design of experimental demonstration systems with various solar pv technology
- Fabrication and testing of PCUs
- Site deployment of solar PV array
- Site implementation of grid connectivity
- Integration of PCU and commissioning
- Testing and field trial
- Training for operators
- Technology validation and demonstration

8. **Project Schedule**

Project Schedule for implementation of 3 MW Grid Interactive Solar Photovoltaic Power Plant

Activity	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
System Specification Power Conditioning Unit												
Preliminary design of Power Conditioning Unit												
Compilation of detailed design documents with BoM and fabrication details												
Site finalization and demarcating the area for whole 3 MW solar PV array deployment												
Formal approvals - Field deployment and grid connection - Extension of utility grid to the proposed site - PPA with the utility												
Procurement and deployment of first set of 1 MW solar PV array - Specification and tender document - Identification of vendor and work order - Site preparations and deployment - Inspection and verification												
Control room and electrical installations - Civil construction for the first 1 MW PCUs - Extension of utility grid to the control room premises - Installation/ commissioning of transformer and electrical cabling												
PCU fabrication/testing (1st set 1MW) - Component procurement - Fabrication - Subsystem level testing - Integration of the PCU												

- System level testing	
Transportation of the PCU to site	
Field deployment and testing of first 1 MW PCU at site	
PCU fabrication/testing (2nd set 1MW)	
Tendering and execution of solar PV array deployment for the second set of 1MW	
Transportation and integration/testing at site(2nd set 1MW)	
Implementation of Solar PV array with experimental systems for different PV technology	
PCU fabrication/testing (3rd set 1MW)	
Transportation and integration/testing at site(3rd set 1MW)	
Integrated operation of the system and validation	
Technology documents/test results	

കരാർനമ്പർ - 2

एक सौ रुपये Rs. 100

₹. 100 ONE HUNDRED RUPEES

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA BB 037369

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement is made and executed on this day 16th December, Two Thousand and Sixteen.

BETWEEN

Centre for Development of Advanced Computing, Vellayambalam, Thiruvananthapuram - 695 033, a constituent Unit of CDAC, a Scientific Society of the Ministry of Communications and Information Technology, Government of India, registered under the Societies Registration Act of 1860, having its registered office at Pune, (hereinafter referred to as " CDAC(T) ", which expression shall, unless it be repugnant to or inconsistent with subject or context thereof, include and be deemed to include their heirs, executors, successors or administrators and assigns) of the ONE PART

AND

ANERT, PMG - Law College Road, Vikas Bhavan P.O., Thiruvananthapuram – 695 033. (hereinafter referred to as "ANERT" which expression shall, unless it be repugnant to or inconsistent with subject or context thereof, include and be deemed to include their heirs, executors, successors or administrators and assigns) of the OTHER PART

hereinafter collectively referred to as the "Parties" or individually as the "Party"

WHEREAS CDAC(T) has strong team for power electronics R&D and has developed various systems for renewable energy conversion using Power Electronics technology.

10.3193
19.5.16

PARTA B.NAIR
Stamp Vendor
Thiruvananthapuram

WHEREAS ANERT is an agency under government of Kerala actively involved in dissemination and related R&D works of new and renewable energy sources.

WHEREAS ANERT approached CDAC(T) for developing technology for *BIPS based grid tied inverter and its implementation*

AND WHEREAS CDAC(T) has agreed to undertake the development of the above technology through a joint development project funded by ANERT as per the terms and conditions detailed below

1.0. SCOPE OF THE MoA

The scope of work as per MoA is to develop the technology for *BIPS based grid tied inverter and its implementation* and to fabricate one proto unit rated 2kWp to realize and validate

- Active power export to grid at UPF or set PF
- Reactive power exchange for PCC voltage control
- Battery charging capability, from both solar PV array and grid
- Export of stored energy in battery to grid.
- Implementation of optimal load dispatch schedule.

The general technical and operational requirements of the system is included in Annexure 1

The activities covered under the scope of the joint development project are:

- Finalisation of specifications and power circuit scheme – ANERT & CDAC(T)
- Preliminary design – CDAC(T) in consultation with ANERT
- Detailed design – CDAC(T) in consultation with ANERT
- Component procurement – CDAC(T)
- System fabrication – CDAC(T)
- Subsystem level testing – CDAC(T)
- Integration and testing of integrated system – CDAC(T)
- Testing and validation at CDAC(T) – CDAC(T) & ANERT
- Testing and validation at ANERT – ANERT & CDAC(T)

CDAC(T) and ANERT agree to fulfil the scope of responsibility on their part as listed above, and complete the project in Ten months time as per the schedule fixed, and to achieve the overall outcome of the product as per the Specification in Annexure –1.

2.0 DELIVERABLES

CDAC(T) agrees to give the following deliverables to ANERT, as part of the development.

- Power Circuit Schematic, Design details and parts list
- Schematic diagram and parts list of the Controller
- Fabrication documents of the PCBs (Gerber files)
- Block diagram and detailed explanation of the control software
- Control Software listing and source code
- One proto unit tested as mentioned in scope of the MoA and as per the specification in Annexure – 1

3.0 OTHER OBLIGATIONS

CDAC(T) shall take reasonable steps to prevent ANERT know how which are meant only for purpose of conducting the project, from unauthorised usage or falling into unauthorised hands. The same is applicable to ANERT also.

4.0 PROJECT SCHEDULE

Date of start of the project is the date of receipt of the first instalment of Payment and the duration is 10 months from the start date as detailed in Annexure 1.

4.0 BUDGET

Total budget outlay of this project is Rs. 32.50 Lakhs (Rupees Thirty Two Lakh Fifty Thousand only)

5.0 PAYMENT TERMS

ANERT agrees to pay the development project fund to CDAC(T) in installments as given below

1. Rs. 13.00 Lakhs (Rupees Thirteen Lakh only) plus Service tax as applicable, on signing the MoA
2. Rs. 13.00 Lakhs (Rupees Thirteen Lakhs only) plus Service tax as applicable, on completion of testing of Proto unit at CDAC(T)
3. Rs. 6.50 Lakhs (Rupees Six Lakh Fifty Thousand only only) plus Service tax as applicable, on handing over the deliverables to ANERT

6.0 INTELLECTUAL PROPERTY

The IPR including design information, designs and data generated through the project, circuits, drawings, etc. shall be held jointly by CDAC(T) and ANERT. CDAC(T) shall continue to own and utilize its pre-existing IP in this area for its technology development activities.

ANERT shall display the name / emblem of CDAC(T) showing that the technology for this product is acquired through joint development project with CDAC(T), on a prominent place in the front cover/door of the product or on the product detail/specification tag.

ANERT is free to carry out on their own, any modifications / refinements in the software for attaining a good commercial value. These modifications/ refinements shall remain the intellectual property of ANERT.

7.0 COMMERCIALISATION

ANERT can execute transfer of technology to third party for commercialization of the technology and the income generated by technology transfer and royalty will be equally shared by CDAC(T) and ANERT based on mutually agreed terms and conditions.

8.0 VALIDITY

Validity of this Agreement is for 5 years from the date of signing of this MoA.

9.0 ARBITRATION

In the event of a dispute or a difference of any nature whatsoever between the Parties during the course of performance of respective obligations arising out of this MoA, the

Parties agree to refer the matter to the Heads of the Institutions to resolve the disputes keeping in view the best interest of the parties and in keeping with the spirit of performance of this MoA. If the matter still remains unresolved, the same shall be referred to the arbitration of two arbitrators, one to be appointed by each party to the dispute, and in case of difference of opinion between them to an umpire appointed by the said two arbitrators before entering on the reference and the decision of such arbitrators or umpire, as the case may be, shall be final and binding on both parties. The venue of arbitration shall be at such place as may be fixed by such arbitrators or umpire and the arbitration proceedings shall take place under the Indian Arbitration and Conciliation Act, 1996 with its amendments from time to time.

10.0 JURISDICTION

The parties to this agreement hereby declare that the Courts in Thiruvananthapuram alone are competent to deal with disputes, if any, arising out of this agreement.

11.0 FORCE MAJEURE

Neither party shall be liable to the other for any delay or failure on their part in performing any of their obligations under this agreement, resulting from any cause beyond their control including, but not limited to strikes, fires, floods, earthquakes, explosions, riots, acts of God, acts of Governments, war, enemy action or political changes, etc.

12.0 COMMUNICATION

Any notice, request, demand, approval, consent or other communications provided or permitted hereunder shall be in writing and given by personal delivery or sent by registered post or by ordinary mail, postage prepaid, or by fax/email addressed to the party for which it is intended at its following address

CDAC(T)	ANERT
Aby Joseph Joint Director Power Electronics Group CDAC Vellayambalam Thiruvananthapurm - 695 033	Kamala Devi V. Scientist F Solar Division ANERT Vikas Bhavan P.O Thiruvanathapuram-695033

In acceptance to the above, we herewith append our signatures below on this day 16th December, Two Thousand and Sixteen.

For and on behalf of CDAC(T)	For and on behalf of ANERT
Sri. R. Sudeep Kumar	Dr. Hari Kumar
Associate Director Power Electronics Group CDAC Vellayambalam Thiruvananthapurm - 695 033	Director ANERT Vikas Bhavan P.O Thiruvanathapuram-695033

डा.आर. सुदीप कुमार / R. Sudeep Kumar
समूह प्रभारी / Group Head
पॉवर इलेक्ट्रॉनिक्स ग्रुप / Power Electronics Group
सी-डैक / C-DAC
तिरुवनंतपुरम / Thiruvananthapuram - 695 033

Witness

Suresh Babu V S
Sr. Consultant
PEG, CDAC, Trivandrum

Witness

Kamala Devi V
Scientist F
ANERT
TVPM

GOVT OF INDIA
VELLAYAMBALAM
THIRUVANANTHAPURAM

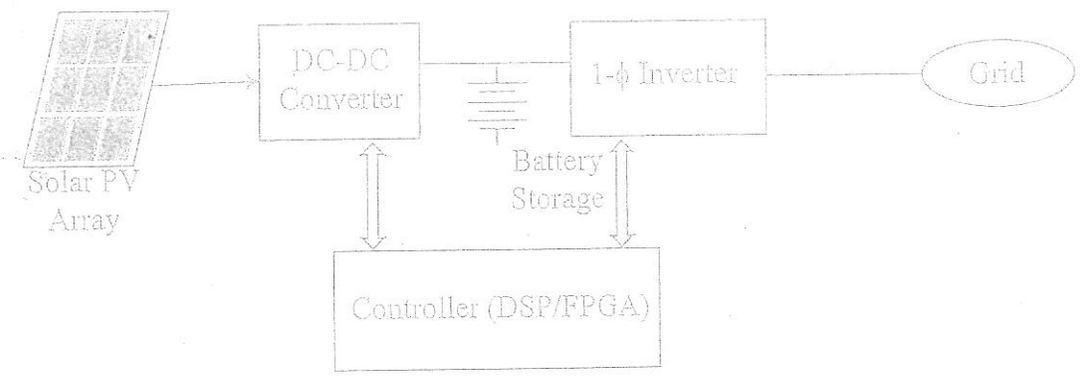
DIRECTOR
ANERT

Annexure I.

BIPS BASED GRID TIED INVERTER TEST KIT AND ITS IMPLEMENTATION IN ANERT

1. General Description

The general scheme of the system for Battery Intervention Power Supply is given below. The system consists of a solar PV array of adequate capacity, power electronics converters for grid interactive operation as well as battery management and digital controller platform for realizing the control of the system.



General scheme of BIPS based grid connected solar PV inverter

The power rating of the converter system will be 2 kW.

The general technical and operational requirement of the system as per the enquiry from ANERT is given below.

- The grid tied inverter shall be 2kVA capacity, single phase, SPWM 230V, 50 Hz ac
- The input voltage shall be 440V DC max
- The MPPT algorithm shall be designed in consultation with ANERT
- There should be anti-islanding protection as designed in consultation with ANERT
- There shall be under voltage protection set at 80% of 230 V of grid voltage
- There shall be over voltage protection set at 110 % of grid voltage
- There shall be under frequency protection set at 47.5Hz
- There shall be over frequency protection set at 50.5Hz
- The re-closure time during an unstable (during anti islanding) operation is 60 secs
- The inverter output shall be synchronous and in phase with the grid wave form

- The CDAC(T) needs to provide the details of the changes made in the circuit/software for implementing the anti-islanding scheme
- There should be an additional feature to smooth output from solar array. There should be P-Q control to tackle voltage fluctuation of the Grid
- The method to smooth the output energy will be as per ANERT's method. It mainly involves storage units.
- A SCADA communication system should be installed to monitor the parameters
- The SPV array shall be provided by ANERT for testing
- All precautions and safety measures should be included as per CEA(Technical standards for connectivity of the distributed generation resources) regulations 2013 and its amendments
- Apart from this the inverter shall be provided with all protections as per IEC 61727

2. Project Schedule

Acivity	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
Specifications and power circuit scheme (ANERT & CDAC(T))										
Preliminary design (CDAC(T) in consultation with ANERT)										
Detailed design (CDAC(T) in consultation with ANERT)										
Component procurement (CDAC(T))										
System fabrication (CDAC(T))										
Subsystem level testing (CDAC(T))										
Integration and testing of integrated system (CDAC(T))										
Testing and validation at CDAC(CDAC(T) & ANERT)										
Testing and validation at ANERT (ANERT & CDAC(T))										

DIRECTOR
ANERT

Sudeep

ഡോ. സുദീപ് കുമാർ / R. Sudeep Kumar
ഗ്രൂപ്പ് തലവൻ / Group Head
പവർ ഇലക്ട്രോണിക്സ് ഗ്രൂപ്പ് / Power Electronics Group
സി-ഡാക് / C-DAC
[illegible]

3. Budget

Sl.No	Head	Amount(Rs. Lakh)
1.	Materials and components	10.00
2.	Manpower	15.00
3.	Travel	1.00
4.	Development charges for PCBs and circuits	4.00
5.	Contingencies	1.00
6.	Centre overhead	1.50
	Total	32.50

The project will be totally funded by ANERT. All taxes/levies extra

അനുബന്ധം - 3

File No. ANERT-TECH/15/2017-S(PK)

അനെർട്ട് ഡയറക്ടറുടെ നടപടിക്രമം

(ഹാജർ : ഡോ. ആർ. ഹരികുമാർ)

സംഗ്രഹം

അനെർട്ട്- രാമക്കൽമേട്ടിൽ സി-ഡാക്കുമായി ചേർന്ന് ഹൈബ്രിഡ് പവർപ്ലാന്റ് സ്ഥാപിക്കുന്ന പ്രോജക്ട് - സി-ഡാക്കിന് ആദ്യ ഗഡു മുൻകൂർ തുക നൽകി ഉത്തരവാകുന്നു.

ഫയൽ നം. ANERT-TECH/15/2017-S(PK)

എ. എഫ്. 890/R&D/ANERT/2017 — 13/12/2017

പരാമർശം: 1) 20.9.2017-ലെ G.O. (Rt) No. 331/2017/POWERനമ്പരായുള്ള സർക്കാർ ഉത്തരവ് (12.6.2017 ലെ G.O(Rt) No. 211/2017/POWER നമ്പർ ഉത്തരവ് പുതുക്കിയത്)

2) 4.10.2017-ൽ നടന്ന മോണിറ്ററിങ് കമ്മിറ്റിയുടെ ആദ്യ യോഗം

3) 19.10.2017 തീയതിയിൽ സി-ഡാക്കും, കെൽട്രോണുമായി ഒപ്പുവച്ച ധാരണാപത്രം

4) സി-ഡാക്കിന്റെ 16.11.2017 തീയതിയിലെ GSTINV109/2017-18 നമ്പരായുള്ള ഇൻവോയിസ്

ഉത്തരവ്

അനെർട്ട് സി-ഡാക്കും കെൽട്രോണുമായി ചേർന്ന് രാമക്കൽമേട്ടിൽ സോളാർ-വിൻഡ് ഹൈബ്രിഡ് പവർ പ്ലാന്റ് സ്ഥാപിക്കാൻ സൂചന (1) പ്രകാരം അനുമതി ലഭിച്ചിട്ടുണ്ട്. സർക്കാർ ഉത്തരവിൽ നിർദ്ദേശിച്ചിട്ടുള്ള മോണിറ്ററിങ് കമ്മിറ്റിയുടെ ആദ്യ യോഗം പരാമർശം (1) പ്രകാരം അനെർട്ടിൽ വച്ച് കൂടുകയുണ്ടായി. സൂചന (3) പ്രകാരം ധാരണാപത്രം ഒപ്പുവയ്ക്കുകയും ചെയ്തിട്ടുണ്ട്..

2) പ്രോജക്ട് ആരംഭിക്കാൻ പ്രോജക്ട് തുകയുടെ 30% വരെ മുൻകൂറായി നൽകാമെന്ന് സൂചന (1)ലും (3) ലും പറഞ്ഞിട്ടുണ്ട്. ഇതുപ്രകാരം സി-ഡാക്ക് സൂചന (4) പ്രകാരം പ്രോജക്ട് തുകയുടെ 30% മായ ₹4,96,50,000 വും അതിന്റെ 5% GST തുകയായ ₹24,82,500 ചേർത്ത് ആകെ ₹5,21,32,500 മുൻകൂറായി ആവശ്യപ്പെട്ടുകൊണ്ട് ഇൻവോയിസ് സമർപ്പിച്ചിട്ടുണ്ട്. ഈ സാഹചര്യത്തിൽ ₹5,21,32,500 (അഞ്ചു കോടി ഇരുപത്തിയൊന്ന് ലക്ഷത്തി മുപ്പത്തി രണ്ടായിരത്തി അഞ്ഞൂറു രൂപ മാത്രം) സി-ഡാക്കിന് അനുവദിച്ചുകൊണ്ട് ഇതിനാൽ ഉത്തരവാകുന്നു. ഈ തുക 2017-18-ലെ പദ്ധതി വിഹിതത്തിൽ '2810-00-800-90(06)-35(P) - Programmes on Renewable Energy - Solar Wind Hybrid Power Plant (pilot - new technology demonstration) '(2017-18/06-06)എന്ന അക്കൗണ്ട് ഹെഡിൽ നിന്ന് ചെലവഴിക്കാവുന്നതാണ്.

ഡയറക്ടർ

To

അക്കൌണ്ട്സ് (ഇൻവോയിസ് സഹിതം)

സെക്രട്ടറിസർ

Annexure-4

Annexure No. 4

PROCEEDINGS OF THE DIRECTOR

Present: Dr. Harikumar R., Director

Abstract:-ANERT – R&D-Sanction for R&D Project and releasing first Instalment to CDAC (T) towards the fund for the Joint R&D project Titled ' Development of BIPS based Grid Tied Solar Inverter' and recruitment of a Project Assistant for timely completion of the work.

File No.: 194/2014/R&D/ACPANELS

A.F. No. 1500/R&D/ANERT/2017 Date: 15/02/2017

1. Read: G.O.(Rt)No:180/PD/2016 dated 27.09.2016
2. Sanction of 48th EC for entering into agreement with CDAC(T)) for Joint R&D with ANERT.
3. Minutes of the R&D committee held on 16/12/2016.
4. MoA signed between ANERT and CDAC (T)
5. R. Invoice No: 240/2016-17 Dated 22-12-2016

ORDER

During the current financial year, ANERT envisaged to undertake the R&D project titled 'Development of BIPS based Grid Tied Solar Inverter' which has challenging features compared with conventional Grid tied inverters. As per G.O. read 1 above, Administrative sanction was accorded to this project proposal included in the Annual Plan 2016-17. Under this, sanction was given for implementation of this plan activity and an amount of Rs. 40 lakhs was allocated as the financial target under the Head of account 2810-00-800-90 (04). A project proposal was prepared by ANERT for executing this project with CDAC (T) as a joint venture scheme. Sanction of 48th EC was obtained for the same and a Memorandum of Agreement was signed between the Director, ANERT and HEAD, PEG, CDAC (T) on 16.12.16, read 3&4. Accordingly, ANERT agreed to fund the Joint R&D project for a total amount of Rs.32.50 lakhs (taxes extra). The scope of the MoA is to develop the technology and to fabricate one prototype rated 2 KWp. The duration of the project shall be ten months. The payment shall be released in three instalments as stated below:s

1. Rs. 13.00 lakhs [illegible]
2. Rs. 13.00 lakhs plus service tax as applicable, on completion of testing of Prototype unit at CDAC (T).
3. Rs. 6.50 lakhs plus service tax as applicable, on handing over the deliverables to ANERT.

Any communication and exchange of information, discussion over design shall be with Smt. Kamala Devi V., Scientist F, ANERT, Vikas Bhawan P.O., Thiruvananthapuram who will be in charge of this project.

The first instalment being Rs. 14,95,000.00 lakhs (Rupees Thirteen lakh plus service tax and others being One lakh ninety five thousand only) as applicable, shall be released on signing the MoA as per the agreement.

In the above circumstances, sanction is accorded to commence the work with the release an amount of Rs. 14,95,000.00 lakhs (Rupees fourteen lakh ninety five thousand only) towards the first instalment to Centre for Development of Advanced Computing (CDAC (T)), P.B. No. 6520, Vellayambalam, Thiruvananthapuram- 695033. The expenditure shall be met from the Head of Account 2810-00-800-90 (04) during the current financial year. (2016-17)

Director

Received

CA to Director

15/02/17

അനുബന്ധം-5

File No.ANERT-TECH/139/2017-S(PK)

ANERT
Proceedings of DIRECTOR
(*Present:* HARIKUMAR R)

Abstract

ANERT - Portal for programme management and workflow - software development by Keltron - release of advance payment - orders issued.

File No. ANERT-TECH/139/2017-S(PK)

A.F. no. 1228/R&D/ANERT/2018 31/03/2018

Read: 1) G.O.(Rt) No. 385/2017/POWER dated 09/11/2017

2) Keltron proposal vide letter no. ITBG/SWG/ANERT/170602/150 dated 2.6.2017 and revised offer vide letter no. ITBG/SWG/ANERT/171025/473 dated 25.10.2017

3) Order issued to Keltron for development of portal vide letter no. ANERT-TECH/139/2017-S(PK) dated 02/11/2017

4) Invoice no. ITBG/17-18/5417/SWG/147 dated 30.11.2017 of Keltron

ORDER

As per Government order read 1, sanction was obtained for development of the portal. Keltron has complied with the requirements and submitted offer vide 2nd cited and orders were issued by ANERT vide 3rd cited.

2) Keltron had submitted agreement and Software Requirement Specification. This was revised by discussions with ANERT and is now approved. As per invoice of Keltron read 4 above, they have requested for release of 50% advance payment, as specified in our order.

3) In this circumstance, sanction is accorded for the release of ₹14,10,808 (₹11,95,600 [50% order amount] + ₹2,15,208 [GST]) (Rupees fourteen lakh ten thousand eight hundred and eight only) as advance to Keltron. The expenditure may be met from the plan funds for eGovernance [Head of Account 2810-00-800-90(06)].

DIRECTOR

Accounts

Forwarded /by Order

K. Premkumar

ANERT

Proceedings of DIRECTOR

(Present: HARIKUMAR R)

ABSTRACT

ANERT - Portal for programme management and workflow - software development by Keltron - release of second part payment - sanctioned-orders issued.

File No. ANERT-TECH/139/2017-S(PK)

A.F. 450/R&D/ANERT/2018 20/08/2018

Read:

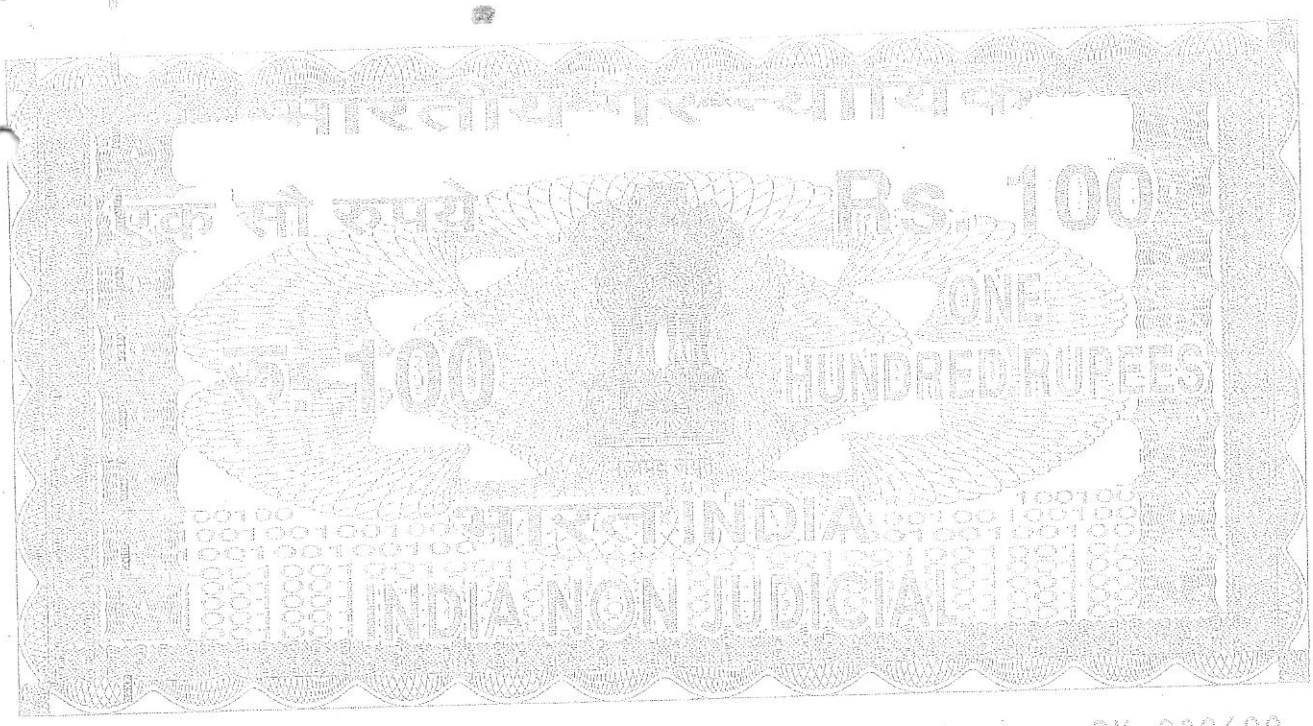
1. G.O.(Rt)No. 385/2017/POWER dated 09/11/2017
2. Letter no.ITBG/SWG/ANERT/170602/150dated 2.6.2017 and revised offer vide letter no. ITBG/SWG/ANERT/171025/473 dated 25.10.2017
3. Order issued to Keltron for development of portal vide letter no. ANERTTECH/139/2017-S(PK) dated 02/11/2017
4. Invoice no. ITBG/SWG/ANERT/181308/321 dated 13.08.2018 of Keltron

ORDER

As per Government order read 1, administrative sanction was accorded for the development of the programme mamangement portal as a part of Programmes on Renewable Energy for an amount of Rs.93.56 lakhs.. Keltron has complied with the requirements and submitted offer read as 2nd paper above and subsequently ANERT issued workorder vide ref 3rd above. Keltron had completed the development of the application portal which is now operational from 5-Jun-2018. As per invoice of Keltron read as 4th paper above, they have requested for the release of the second part payment (40%), as specified in our order.

In this circumstance, sanction is accorded for the release of ₹11,28,646 (₹9,56,480 [40% order amount] + ₹1,72,166 [GST]) (Rupees eleven lakhs twenty eight thousand six hundred and forty six only) as second part payment to M/s Keltron. The expenditure may be met from the plan funds for eGovernance [Head of Account 2810-00-800-90(07)].

DIRECTOR



കേരളം केरल KERALA

BK 089609

AGREEMENT

The agreement is executed on this ...24th..... day of ...March.. 2018 BETWEEN the Director, Agency for Non-Conventional Energy and Rural Technology, Law College Road, Vikas Bhavan P.O. Thiruvananthapuram Kerala-695033 (hereinafter referred to as 'the Purchaser' which expression shall include its successors and assigns).

AND

Kerala State Electronics Development Corporation Ltd., a Government of Kerala Undertaking, having its registered office at Keltron House, Vellayambalam, Thiruvananthapuram (hereinafter referred to as 'the Contractor' which expression shall unless the context does not admit, include its successors and assigns) represented by Usha. K, Head (SWG), of the OTHER PART;

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

S. Sobhanakumari

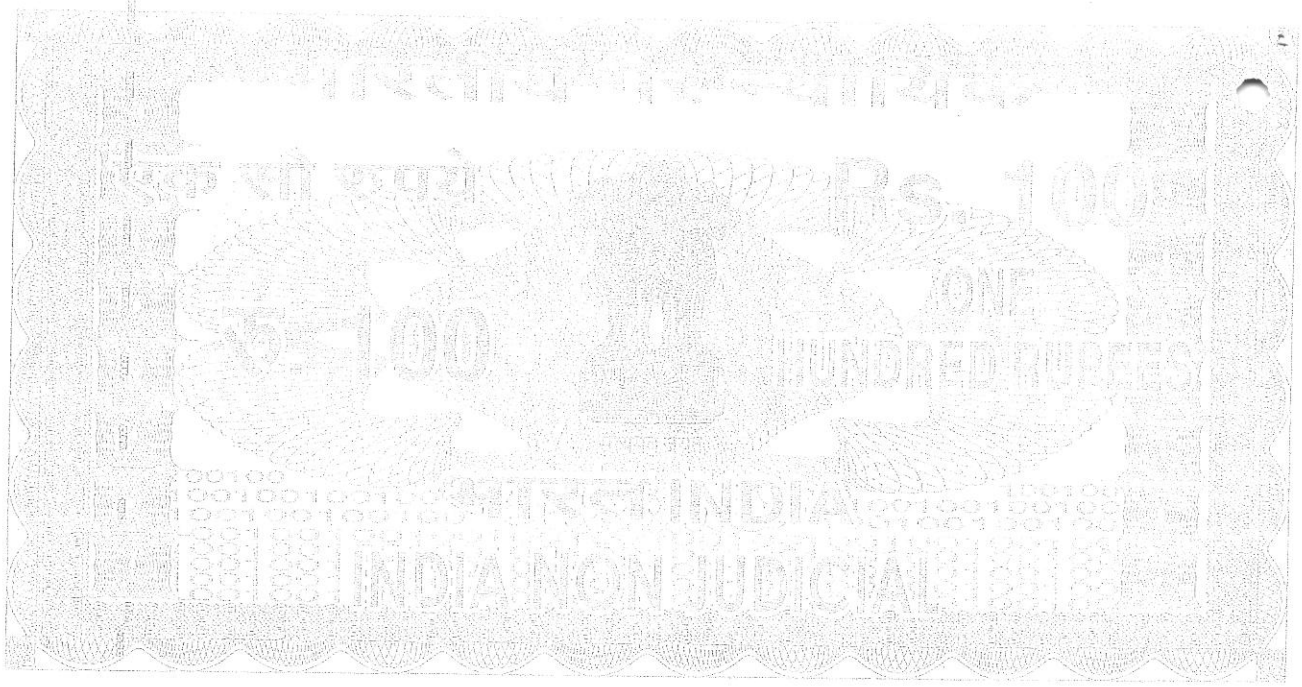
SASTHAMANGALAM
VENDOR
S. SOBHANAKUMARI

No. 70674

17-2-17

KSEDC Ltd

07 FEB 2017



കേരളം केरल KERALA BK 089607

WHERE AS:

1.The Contractor has submitted the Proposal No: ITBG/SWG/ANERT/170602/150 dated 2.06.2017 and Negotiation Letter No: ITBG/SWG/ANERT/171025 dated 25.10.2017 for the Development/Implementation of Application Software/Portal for Programme Management to the Purchaser.

2. The Purchaser has pleased to accept the offer subject to the conditions stipulated in the Order No: ANERT-TECH/139/2017-S(PK) dated 02.11.2017 (which shall form part of this agreement as if incorporated herein)

3. The purchaser has decided for the Development/Implementation of Application Software/Portal for programme Management for Agency for Non-Conventional Energy and Rural Technology. The total approved project outlay is an amount of Rs.28,21,616/- (Rupees Twenty Eight Lakhs Twenty One Thousand Six Hundred and Sixteen only) (inclusive of taxes).

USHA K.
DGM (SWG)
IT Business Group
Keltron, Valloyambalam

Keltron Bhavan
Valloyambalam
Trivandrum

No. 70875

17-2-17

S. Sobhanakumaran

SASTHAMANGALAM
VENDOR
S. SOBHANAKUMARI

KSEDC

07 FEB 2017

NOW THEREFORE THIS AGREEMENT WITNESS and it is hereby agreed by and between the parties hereto as follows:

SERVICES

1. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz
   - Terms and Conditions of this agreement.
   - Order No: ANERT-TECH/139/2017-S(PK) dated 02.11.2017
   - KELTRON's Proposal No: ITBG/SWG/ANERT/170602/150 dated 2.06.2017 and Negotiation Letter No: ITBG/SWG/ANERT/171025 dated 25.10.2017 Submitted by Contractor to the Purchaser.

   In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed above, this Agreement being the controlling document, unless otherwise specifically agreed by the parties in writing.

2. The scope of services as part of this project constitutes:

   Design, Development, Implementation and training of Application Software/Portal for programme Management.

3. Data entry is not part of this contract except the master data entry.

4. The Contractor agrees to complete the project milestones listed in the proposal, deliverables and services within the implementation period given in proposal. Maintenance of milestones of implementation schedule is closely linked to prompt feedback and document acceptance by the client Any delay in project schedules which can be attributed to the reasons within the control and purview of the contractor will be penalised at the rate of 0.1% of amount released against work completion for delay of each week to a maximum of 10% of amount released against work completion

5. Any failure or omission to carry out the provisions of this agreement shall not give rise to any claim by the Parties, if such failure or omission arises from "FORCE MAJEURE" which shall include all acts of natural calamities such as fires, floods, earth quakes, hurricane or civil strikes, riots, lightning, embargoes or from any political or other reasons beyond the control of the parties including war (whether declared or not), civil war or a state of insurrection.

6. Contractor agrees to provide 12 months warranty for the above stated software modules from the date of installation of beta version of each module. Any change in basic architecture other than mentioned within the scope of proposal may lead to additional cost and time. The change requests will be considered separately and will provide the estimates before beginning such tasks for which separate order will be issued. Warranty will start from the customer accepted date of implementation of the software or from the start of online usage of any module whichever is earlier and will end on expiry of 12 months.

USHA K.
DGM (SWG)
IT Business Group
Kelltron, Vellayambalam
Thiruvananthapuram-695033

Kelltron House
Vellayambalam
Trivandrum
695033

7. Any application software problems during warranty period will be attended within 24 hours of registering complaint in the following address: ITBG/Software KELTRON, Keltron House,Vellayambalam, Telephone No: 0471-4094444, Extn: (225)&(207), email:software@keltron.org and will be rectified within 48 hours. Any service calls on account of operations which are not in the scope of warranty terms of the contractor will be charged extra.

8. Annual Maintenance Contract (AMC): Contractor is ready to give annual maintenance contract, after the warranty period on mutually agreeable terms, not increasing 12% of total development cost. It will not cover any modification that affects the database or system design.

9. Requests for enhancement of rates once accepted will not be considered under any circumstances.

10. It is the responsibility of Purchaser to arrange necessary hardware prior to the installation of software. Contractor will not be responsible for any delay in project execution, due to delay in procuring the requisite hardware.

11. The developed software will be loaded in the Keltron server for a period of six months from the date of this agreement free of cost. After this period of time the purchaser shall choose any of the following options:
    1) The purchaser can host the application in Kerala State Data Centre
    2) The application software can be hosted in Keltron server according to mutually agreeable rates.

12. The Contractor agrees that time is the essence of this contract. This agreement shall be effective from the date of order issued by the Purchaser and the term of this agreement shall be for a period of twelve (12) months from the date of execution of this agreement or the term of warranty period, whichever is later. The agreement may be renewed for further period with mutual consent of the Purchaser and Contractor.

    (a) The total cost for the Development /Implementation of Application Software/Portal for Programme Management for the use of Purchaser is Rs.28,21,616/- (Rupees Twenty Eight Lakhs Twenty One Thousand Six Hundred and Sixteen only) (inclusive of taxes).

    (b). The purchaser agrees to release up to 50% as advance payment, which shall be paid on signing of this Agreement and acceptance of SRS.

    (c). Remaining 40% amount shall be paid after the delivery of the application Software and remaining 10% on successful completion of Warranty support.

    (d) All payments to the Contractor for satisfactory supplies will be made after scrutiny of Contractor's bills by drafts or cheques on Reserve Bank of India or State Bank of India (at any of their principal branches in India).

    (e) The contractor will produce stamped pre-receipt/ invoices in all cases for release of payments.

13. If no formal response is given back to the Contractor within a period of 30 days after intimating completion of customization of any module of the software, the software module shall be deemed as accepted by the Purchaser.

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

Keltron House
Vellayambalam
Trivandrum
695033

14. The Purchaser shall give payment to the contractor as per the terms set out in the work order issued by the Purchaser.

15. In case the supply of software involves any defects the contractor agrees that the defects will be rectified within the time and at the place specified by the Purchaser in that behalf. It shall also be the duty and responsibility of the contractor to see that the software thus corrected is in good working condition to the satisfaction of the person duly authorized by the Purchaser in that behalf and to ensure the proper functioning of the software till the warranty period is over. In the event of the failure of the contractor to remedy the defects within the time and at the place specified by the Purchaser or in the event of the software failing to function properly during the guarantee period, the amount spent by the Purchaser and the loss sustained by the Purchaser on this account by making alternative arrangements shall be recoverable from the contractor.

16. From the Purchaser, there will be a senior officer assigned as a Nodal Officer. The nodal officer will be responsible for providing all the necessary support to KELTRON for the implementation. He/She will also be responsible for communicating any support requirements to the officials of KELTRON. All official communications should happen through official email (or other official means).

17. The Contractor agrees to ensure the integrity and authenticity of the entered data and to protect the same for ensuring data privacy.

18. Contractor/Purchaser shall use the Information of the other party only in connection with the contemplated purpose (project specific) and shall not use for other purpose or disclose to any third party. Contractor/Purchaser may provide Information only to its employees who: (a) have a substantive need to know such Information in connection with the Project; (b) have been advised of the confidential and proprietary nature of such Information; and (c) have personally agreed with Receiving Party in writing to protect from unauthorized disclosure all confidential and proprietary information, of whatever source, to which they have access in the course of their employment.

19. If the Receiving Party is required to provide the Information to any Court or Government Agency pursuant to written Court order, subpoena, regulation or process of law, the Receiving Party shall provide the Disclosing Party with prompt written notice of such requirement and cooperate with the Disclosing Party to appropriately protect against or limit the scope of such disclosure to the fullest extent permitted by law. The Receiving Party shall continue to protect as confidential and proprietary all Information disclosed in response to a written Court order, subpoena, regulation or process of law.

20. The Contractor will not disclose the contents of any documents, or transfer such knowledge of Purchaser, as revealed to any other organization. The Purchaser is responsible for all third parties licensing terms and conditions e.g. Windows etc for operating the software. Security testing of software by an external agency approved by CERT (if needed) shall be done by the Purchaser separately, at their own cost. The contractor shall provide all necessary support for this operation.

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

ELECTRONICS DEVELOPMENT CORPORATION LTD. * KERALA * INDIA
Keltron House
Vellayambalam
Trivandrum
695033

21. Intellectual Property Rights (IPR) of custom developed Software modules developed exclusively for this project, shall be with the Purchaser unless it is in the open source domain. The source code shall be transferred to the designated server owned by customer, on the basis of a suitable non disclosure agreement.

22. The Contractor concords to provide imparted knowledge about the new software to all users and stakeholders at the required level. The Contractor provides adequate documents and manuals. Training will be provided to ensure the proper use and operation of applications and infrastructure.

23. The Contractor will ensure that the implementation of software includes running the system in parallel with the old system for a while and comparing the behaviour and results. The parallel running of systems can be discontinued after a minimum of three months from start when the system is stabilized.

24. The Contractor undertakes to treat as absolutely confidential and keep secret all inputs both oral and written leading up to development of software for the use of Purchaser as an exclusive property of Purchaser that shall not be disclosed to third parties whatever. Contractor will not disclose the contents of any documents, or transfer such knowledge of Purchaser, as revealed to Contractor during the course of the assignment, to any other organization without the prior written consent of Purchaser.

25. If any dispute or difference of any kind whatsoever were to arise between the Purchaser and Contractor, the Purchaser may approach the Managing Director of Contractor. If the dispute is not settled between the Purchaser and Managing Director of Contractor within 30 days, the parties to the dispute may refer the matter to the state government for a settlement.

26. This Agreement shall be governed by and construed in all respects in accordance with the laws of India.

27. Modification /Amendment in this agreement can be done only with mutual written consent of both the parties;

ASSIGNMENT AND NOTICE

1. This Agreement shall not be assigned to any third party by either of the parties.
2. Any notice or communication with reference to this Agreement shall be sent by letter, telegram, fax or E-mail to the following address.

The Purchaser
The Director,
Agency for Non-Conventional Energy and Rural Technology,
Law College Road,
Vikas Bhavan P.O.
Thiruvananthapuram Kerala-695033.
E-mail: director@anert.in

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

The Contractor
The Deputy General Manager
ITBG/SWG
Keltron house
Vellayambalam -- 695 033
E-mail: software@keltron.org

All such notices/communication sent by telegram/telex/E-mail shall be confirmed forthwith by letter.

3. This Agreement shall be released, discharged, amended etc. only by agreement of both parties in writing.

INWITNESS WHEREOF the parties hereto have caused these presents to be executed to duplicate on their respective behalf at Thiruvananthapuram the day and the year first above written.

SIGNED, SEALED AND DELIVERED by....., Director, for and on behalf of the Agency for Non-Conventional Energy and Rural Technology, Vikas Bhavan P.O, Thiruvananthapuram-695003.

..... Dr Hari Kumar R
Director, ANERT

(Office Seal)

DIRECTOR
ANERT

In the presence of Witnesses:

.....
K. Ananthakumar, Scientist
Agency for Non-Conventional Energy
and Rural Technology,
Law College Road,
Vikas Bhavan P.O.
Thiruvananthapuram
Kerala-695033.

.....
C.K. Chandra Prakash
Programme Officer
Agency for Non-Conventional Energy
and Rural Technology,
Law College Road,
Vikas Bhavan P.O.
Thiruvananthapuram
Kerala-695033.

SIGNED, SEALED AND DELIVERED by Smt Usha.K, Head (SWG) for and on behalf of Kerala State Electronics Development Corporation Ltd.

Smt Usha. K

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

(Office Seal)

In the presence of Witnesses:

Vipin S.S
Deputy Manager
ITBG/SWG,KELTRON
Vellayambalam
Thiruvananthapuram-695033

Bonny P.P
Assistant Manager
ITBG/SWG,KELTRON
Vellayambalam
Thiruvananthapuram-695033

File No.ANERT-TECH/236/2017-S(PK)

ANERT
Proceedings of DIRECTOR
(Present: HARIKUMAR R)

ABSTRACT

ANERT - CRM portal - software development by Keltron - release of advance payment - orders issued.

File no. ANERT-TECH/236/2017-S(PK)

A.F.No: 615/R&D/ANERT/2018 15/10/2018

Read:
1. G.O.(Rt) No. 385/2017/POWER dated 09/11/2017
2. Keltron proposal vide letter no. ITBG/SWG/ANERT/180320/931 dated 20.03.2018 and revised offer vide letter no. ITBG/SWG/ANERT/180327/973 dated 27.03.2018
3. Order issued to Keltron for development of portal vide letter no. ANERT-TECH/236/2017-S(PK) dated 20.04.2018
4. Keltron SRS (ver 1.0) vide document no: ITBG/SWG/SRS/0005/18-19 dated 13.07.2018 and revised SRS (ver 1.1) submtted on 17.08.2018
5. Invoice no. ITBG/18-19/3087/SWG/89 dated 16.08.2018 of Keltron, forwarded vide letter no. ITBG/SWG/ANERT/1808186/328 dated 16.8.2018

ORDER

1. As per Government order read 1, sanction was obtained for development of the CRM portal . Keltron has complied with all the requirements of the portal and submitted proposal vide ref 2nd and as per ref 3rd cited orders were issued by ANERT.

2. Keltron had submitted Software Requirement Specification. The SRS was revised after discussions with ANERT and is now accepted. Keltron has also signed MoU for the execution of the project. As per invoice of Keltron read 5th, they have requested for the release of 50% advance payment, in line with the conditions of the work order and MOU.

3. In this circumstance, sanction is accorded for the release of ₹3,96,850 (₹3,36,513.56 [50% order amount] + ₹60,536.44 [GST]) (Rupees Three Lakhs Ninety Six Thousand Eight hundred and Fifty Only) as advance to Keltron. The expenditure may be met from the plan funds for eGovernance [Head of Account 2810-00-800-90(06)].

(Rs. 3,83,398 after deducting IT TDS and GST TDS)

DIRECTOR

To
Accounts (with Invoice)

GST TDS ?.

IT TDS ?

കേരളം केरल KERALA

BW 356764

AGREEMENT

The agreement is executed on this ..... day of ..... 2018 BETWEEN the Director, Agency for Non-Conventional Energy and Rural Technology, Law College Road, Vikas Bhavan P.O. Thiruvananthapuram Kerala-695033 (hereinafter referred to as 'the Purchaser' which expression shall include its successors and assigns).

AND

Kerala State Electronics Development Corporation Ltd., a Government of Kerala Undertaking, having its registered office at Keltron House, Vellayambalam, Thiruvananthapuram (hereinafter referred to as 'the Contractor' which expression shall unless the context does not admit, include its successors and assigns) represented by Betty John, Head (ITBG), of the OTHER PART;

BETTY JOHN
CHIEF GENERAL MANAGER i/c
(CHR, Admin & ITBG) Keltron
Vellayambalam, Thiruvananthapuram

Keltron House
Vellayambalam
Trivandrum-33

S. Sobhanakumari

SASTHAMANGALAM
VENDOR
S. SOBHANAKUMARI

22-06-18

21 JUN 2018

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BH 356721

WHERE AS:

1. The Contractor has submitted the proposal no: ITBG/SWG/ANERT/180320/931 dated 20.03.2018 and negotiation letter no: ITBG/SWG/ANERT/180327/973 dated 27.03.2018 for CRM- Ticketing Software to the Purchaser.

2. The Purchaser has pleased to accept the offer subject to the conditions stipulated in the Order No: ANERT-TECH/236/2017-S(PK) dated 20.04.2018 (which shall form part of this agreement as if incorporated herein).

3. The purchaser has decided for CRM- Ticketing at Agency for Non-Conventional Energy and Rural Technology. The total approved project outlay is an amount of Rs.7,93,700/- (Rupees Seven Lakhs Ninty Three Thousand Seven Hundred only) (inclusive of taxes).

BETTY JOHN
CHIEF GENERAL MANAGER I/c
(CHR, Admin & ITBG) Keltron
Vellayambalam, Trivandrum

Bgly

KELTRON HOUSE, VELLAYAMBALAM, TRIVANDRUM-33

21 JUN 2018

S. Sobhanakumari

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22-06-18

KSEDC Ltd

SASTHAMANGALAM
VENDOR
S. SOBHANAKUMARI

NOW THEREFORE THIS AGREEMENT WITNESS and it is hereby agreed by and between the parties hereto as follows:

SERVICES

1. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz

   - Terms and Conditions of this agreement.
   - Order No: ANERT-TECH/236/2017-S(PK) dated 20.04.2018
   - KELTRON's Proposal No: ITBG/SWG/ANERT/180320/931 dated 20.03.2018 for CRM- Ticketing submitted by Contractor to the Purchaser.
   - KELTRON's Negotiation Letter No: ITBG/SWG/ANERT/180327/973 dated 27.03.2018 submitted by Contractor to the Purchaser.

   In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed above, this Agreement being the controlling document, unless otherwise specifically agreed by the parties in writing.

2. The scope of services as part of this project constitutes:

   Development/Implementation of application software/portal for CRM- Ticketing at Agency for Non-Conventional Energy and Rural Technology

3. Data entry is not part of this contract except the master data entry.

4. The Contractor agrees to complete the project milestones listed in the proposal, deliverables and services within the implementation period given in proposal. Maintenance of milestones of implementation schedule is closely linked to prompt feedback and document acceptance by the client Any delay in project schedules which can be attributed to the reasons within the control and purview of the contractor will be penalised at the rate of 0.1% of amount released against work completion for delay of each week to a maximum of 10% of amount released against work completion

5. Any failure or omission to carry out the provisions of this agreement shall not give rise to any claim by the Parties, if such failure or omission arises from "FORCE MAJEURE" which shall include all acts of natural calamities such as fires, floods, earth quakes, hurricane or civil strikes, riots, lightning, embargoes or from any political or other reasons beyond the control of the parties including war (whether declared or not), civil war or a state of insurrection.

6. Contractor agrees to provide 12 months warranty for the above stated software modules from the date of installation of beta version of each module. Any change in basic architecture other than mentioned within the scope of proposal may lead to additional cost and time. The change requests will be considered separately and will provide the estimates before beginning such tasks for which separate order will be issued. Warranty will start from the customer accepted date of implementation of the software or from the start of online usage of any module whichever is earlier and will end on expiry of 12 months.

BETTY JOHN
CHIEF GENERAL MANAGER (C
(CHR, Admin & ITBG) Keltron
Vellayambalam, Tvm

7. Any application software problems during warranty period will be attended within 24 hours of registering complaint in the following address: ITBG/Software KELTRON, Keltron House, Vellayambalam, Telephone No: 0471-4094444, Extn: (225)&(207), email:software@keltron.org and will be rectified within 48 hours. Any service calls on account of operations which are not in the scope of warranty terms of the contractor will be charged extra.

8. Annual Maintenance Contract (AMC): Contractor is ready to give annual maintenance contract, after the warranty period on mutually agreeable terms, not increasing 12% of total development cost. It will not cover any modification that affects the database or system design.

9. Requests for enhancement of rates once accepted will not be considered under any circumstances.

10. It is the responsibility of Purchaser to arrange necessary hardware prior to the installation of software. Contractor will not be responsible for any delay in project execution, due to delay in procuring the requisite hardware.

11. The developed software will be loaded in the Keltron server for a period of six months from the date of this agreement free of cost. After this period of time the purchaser shall choose any of the following options:

    1) The purchaser can host the application in Kerala State Data Centre
    2) The application software can be hosted in Keltron server according to mutually agreeable rates.
    3)

12. The Contractor agrees that time is the essence of this contract. This agreement shall be effective from the date of order issued by the Purchaser and the term of this agreement shall be for a period of twelve (12) months from the date of execution of this agreement or the term of warranty period, whichever is later. The agreement may be renewed for further period with mutual consent of the Purchaser and Contractor.

    (a) The total project cost for Development/Implementation of application software/portal for CRM- Ticketing for the use of Purchaser comes to Rs.6,72,627/- (Rupees Six Lakhs Seventy Two Thousand Six Hundred and Twenty seven only) (exclusive of taxes) and GST amount of Rs. 1,21,073/-. Hence the total amount comes to Rs.7,93,700/- (Rupees Seven Lakhs Ninty Three Thousand Seven Hundred only) (inclusive of taxes).

    (b) The purchaser agrees to release 50% of the total amount as advance for Software along with the signing of the contract and acceptance of SRS.

    (c) Remaining 40% amount of software shall be paid after the application delivery of the application Software.

    (d) Remaining 10% amount of software shall be paid after the completion of warranty support.

    (e) All payments to the Contractor for satisfactory supplies will be made after scrutiny of Contractor's bills by drafts or cheques on Reserve Bank of India or State Bank of India (at any of their principal branches in India).

BETTY JOHN
CHIEF GENERAL MANAGER (A)
(CHR, Admin & ITBG) Keltron
Vellayambalam, Trivandrum

(f) The contractor will produce stamped pre-receipt/ invoices in all cases for release of payments.

13. If no formal response is given back to the Contractor within a period of 30 days after intimating completion of customization of any module of the software, the software module shall be deemed as accepted by the Purchaser.

14. The Purchaser shall give payment to the contractor as per the terms set out in the work order issued by the Purchaser.

15. In case the supply of software involves any defects the contractor agrees that the defects will be rectified within the time and at the place specified by the Purchaser in that behalf. It shall also be the duty and responsibility of the contractor to see that the software thus corrected is in good working condition to the satisfaction of the person duly authorized by the Purchaser in that behalf and to ensure the proper functioning of the software till the warranty period is over. In the event of the failure of the contractor to remedy the defects within the time and at the place specified by the Purchaser or in the event of the software failing to function properly during the guarantee period, the amount spent by the Purchaser and the loss sustained by the Purchaser on this account by making alternative arrangements shall be recoverable from the contractor.

16. From the Purchaser, there will be a senior officer assigned as a Nodal Officer. The nodal officer will be responsible for providing all the necessary support to KELTRON for the implementation. He/She will also be responsible for communicating any support requirements to the officials of KELTRON. All official communications should happen through official email (or other official means).

17. The Contractor agrees to ensure the integrity and authenticity of the entered data and to protect the same for ensuring data privacy.

18. Contractor/Purchaser shall use the Information of the other party only in connection with the contemplated purpose (project specific) and shall not use for other purpose or disclose to any third party. Contractor/Purchaser may provide Information only to its employees who: (a) have a substantive need to know such Information in connection with the Project; (b) have been advised of the confidential and proprietary nature of such Information; and (c) have personally agreed with Receiving Party in writing to protect from unauthorized disclosure all confidential and proprietary information, of whatever source, to which they have access in the course of their employment.

19. If the Receiving Party is required to provide the Information to any Court or Government Agency pursuant to written Court order, subpoena, regulation or process of law, the Receiving Party shall provide the Disclosing Party with prompt written notice of such requirement and cooperate with the Disclosing Party to appropriately protect against or limit the scope of such disclosure to the fullest extent permitted by law. The Receiving Party shall continue to protect as confidential and proprietary all Information disclosed in response to a written Court order, subpoena, regulation or process of law.

20. The Contractor will not disclose the contents of any documents, or transfer such knowledge of Purchaser, as revealed to any other organization. The Purchaser is responsible for all third parties licensing terms and conditions e.g. Windows etc for

BETTY JOHN
CHIEF GENERAL MANAGER I/c
(CHR, Admin & ITBG) Keltron
Vellayambalam, Trivandrum

Keltron House
Vellayambalam
Trivandrum-33

operating the software. Security testing of software by an external agency approved by CERT (if needed) shall be done by the Purchaser separately, at their own cost. The contractor shall provide all necessary support for this operation.

21. Intellectual Property Rights (IPR) of custom developed Software modules developed exclusively for this project, shall be with the Purchaser unless it is in the open source domain. The source code shall be transferred to the designated server owned by customer, on the basis of a suitable non disclosure agreement.

22. The Contractor concords to provide imparted knowledge about the new software to all users and stakeholders at the required level. The Contractor provides adequate documents and manuals. Training will be provided to ensure the proper use and operation of applications and infrastructure.

23. The Contractor will ensure that the implementation of software includes running the system in parallel with the old system for a while and comparing the behaviour and results. The parallel running of systems can be discontinued after a minimum of three months from start when the system is stabilized.

24. The Contractor undertakes to treat as absolutely confidential and keep secret all inputs both oral and written leading up to development of software for the use of Purchaser as an exclusive property of Purchaser that shall not be disclosed to third parties whatever. Contractor will not disclose the contents of any documents, or transfer such knowledge of Purchaser, as revealed to Contractor during the course of the assignment, to any other organization without the prior written consent of Purchaser.

25. If any dispute or difference of any kind whatsoever were to arise between the Purchaser and Contractor, the Purchaser may approach the General Manager of Contractor. If the dispute is not settled between the Purchaser and General Manager of Contractor within 30 days, the parties to the dispute may refer the matter to the state government for a settlement.

26. This Agreement shall be governed by and construed in all respects in accordance with the laws of India.

27. Modification /Amendment in this agreement can be done only with mutual written consent of both the parties;

ASSIGNMENT AND NOTICE

1. This Agreement shall not be assigned to any third party by either of the parties.
2. Any notice or communication with reference to this Agreement shall be sent by letter, telegram, fax or E-mail to the following address.

The Purchaser

The Director,
Agency for Non-Conventional Energy and Rural Technology,
Law College Road,
Vikas Bhavan P.O.
Thiruvananthapuram Kerala-695033.
E-mail: director@anert.in

BETTY JOHN
CHIEF GENERAL MANAGER
(CHR, Admin & ITSD) (Cell No)
Vellayambalam, Trivandrum

The Contractor

The Chief General Manager (i/c)
ITBG/SWG, Keltron house
Vellayambalam -- 695 033
E-mail: software@keltron.org

All such notices/communication sent by telegram/telex/E-mail shall be confirmed forthwith by letter.

3. This Agreement shall be released, discharged, amended etc. only by agreement of both parties in writing.

IN WITNESS WHEREOF the parties hereto have caused these presents to be executed to duplicate on their respective behalf at Thiruvananthapuram the day and the year first above written.

SIGNED, SEALED AND DELIVERED by....., Director, for and on behalf of the Agency for Non-Conventional Energy and Rural Technology, Vikas Bhavan P.O, Thiruvananthapuram-695003.

(Office Seal)

.....

In the presence of Witnesses:

.....
.....
Agency for Non-Conventional Energy and Rural Technology,
Law College Road,
Vikas Bhavan P.O.
Thiruvananthapuram
Kerala-695033.

.....
.....
Agency for Non-Conventional Energy and Rural Technology,
Law College Road,
Vikas Bhavan P.O.
Thiruvananthapuram
Kerala-695033.

SIGNED, SEALED AND DELIVERED by Smt Betty John, Head (ITBG) for and on behalf of Kerala State Electronics Development Corporation Ltd.

BJohn

Smt Betty John

BETTY JOHN
CHIEF GENERAL MANAGER I/c
(CHR, Admin & ITBG) Keltron
Vellayambalam, Trivandrum

(Office Seal)

In the presence of Witnesses:

Usha

Usha.K
General Manager
ITBG/SWG,KELTRON
Vellayambalam
Thiruvananthapuram-695033

Vipin.S.S
Deputy Manager
ITBG/SWG,KELTRON
Vellayambalam
Thiruvananthapuram-695033

File No.ANERT-TECH/223/2017-S(PK)

AGENCY FOR NON- CONVENTIONAL ENERGY AND RURAL TECHNOLOGY
(ANERT)
PROCEEDINGS OF THE DIRECTOR
(Present: Dr, R Harikumar)

ABSTRACT

ANERT - Online Market Place Application- software development by Keltron - release of advance payment - orders issued
File No. ANERT-TECH/223/2017-S(PK)

A.F. No 96 /R&D /ANERT/2018 07/05/2018

Read: 1. Keltron proposal vide letter no. ITBG/SWG/IP/2017/008 dated 20.04.2017
2. G.O.(Rt) No. 385/2017/POWER dated 09.11.2017
3. Order issued to Keltron for development of portal vide letter no. ANERT-TECH/223/2017-S(PK) dated 04.11.2017
4. Letter no. ITBG/SWG/ANERT/26042/59 dated 26.4.2018 submitting the SRS
5. Invoice no. ITBG /17 -18 /9600 /SWG /316 dated 31.03.2018 of Keltron
6. Letter no. ITBG/SWG/ANERT/180502/072 dated 2.5.2018 submitting the revised agreement

ORDER

1. As per Government order read 2nd paper above, sanction was accorded for the development of an electronic marketplace for renewable energy devices and systems for ANERT. Considering the proposal, and also based on the minutes of the Working Group Meeting, M/s KELTRON was entrusted with the work vide reference read 3rd cited.
2. Now, Keltron had submitted Software Requirement Specification invoice and agreement vide reference read as 4th, 5th and 6th above. As per the conditions, they have requested for the release of 25% advance payment, as specified in our order.
3. In this circumstance, sanction is accorded for the release of ₹3,54,000 (₹3,00,000 [25% order amount] + ₹54,000 [GST]) (Rupees Three lakhs Fifty Four Thousand only) as advance payment to Keltron for the Development of Online Market Place Application for ANERT. The expenditure may be met from the plan funds for eGovernance [Head of Account 2810-00-800-90(06)].

DIRECTOR

Copy to: Accounts

ANERT
Proceedings of DIRECTOR
(Present: HARIKUMAR R)

ABSTRACT

ANERT - Online Market Place Application- software development by Keltron - release of second part payment - orders issued

File No. ANERT-TECH/223/2017-S(PK)

A.F. no440/R&D /ANERT/2018 17/08/2018

Read:
1. G.O.(Rt) No. 385/2017/POWER dated 09.11.2017
2. Order issued to Keltron for development of portal vide letter no. ANERT-TECH/223/2017-S(PK) dated 04.11.2017
3. Keltron invoice no. ITBG /17-18/SWG/PI/024 dated 05.12.2017
4. Keltron invoice no. ITBG/17-18/SWG/PI/316 dt 31.03.2018
5. Keltron letter no. ITBG/SWG/ANERT/26042/59 dated 26.4.2018 submitting the SRS
6. ANERT A.O. no: 96/R&D/ANERT/2018 dated 07.05.2018
7. Keltron letter no. ITBG/SWG/ANERT/180713/240 dated 13.07.2018

ORDER

1. As per Government order read first above, sanction was accorded for the development of an electronic marketplace for renewable energy devices and systems for ANERT and M/s KELTRON was entrusted with the work vide reference read 2nd.
2. ANERT had released payment of 25% of project cost to Keltron against invoice read 4th. The eMarketplace www.buymysun.com was launched on 5-Jun-2018 and is now operational. Keltron has now submitted a letter [read 5th] requesting pending payment against invoice read 3rd.
3. As per the conditions in the agreement, we need to pay 50% amount after SRS submission and the completion of design phase.
4. In the above circumstances, sanction is accorded for the release of ₹3,54,000 (₹3,00,000 + ₹54,000 [GST]) (Rupees three lakhs fifty four thousand only) as payment to Keltron for the Development of Online Market Place Application for ANERT against invoice read 3rd. The

expenditure may be met from the plan funds for eGovernance [Head of Account 2810-00-800-90(07) - 13].

DIRECTOR

Accounts

ANERT
Proceedings of DIRECTOR
(Present: HARIKUMAR R)

ABSTRACT

ANERT - Online Market Place Application- software development by Keltron - release of 3rd instalment - orders issued

File no. ANERT-TECH/223/2017-S(PK)

A.F. no.451/R&D /ANERT/2018 20/08/2018

Read :

1. Keltron proposal vide letter no. ITBG/SWG/IP/2017/008 dated 20.04.2017
2. G.O.(Rt) No. 385/2017/POWER dated 09.11.2017
3. Order issued to Keltron for development of portal vide letter no. ANERT/TECH/223/2017-S(PK) dated 04.11.2017
4. ANERT proceedings no. 96/R&D/ANERT/2018 dated 7.5.2018
5. ANERT proceedings no. 440/R&D/ANERT/2018 dated 17.08.2018
6. Invoice no. ITBG /SWG/ANERT/180721/264 dated 21.07.2018 of Keltron submitted vide letter no. ITBG/SWG/ANERT/180721/264 dated 21.7.2018

ORDER

1. As per Government order read 2nd paper above, sanction was accorded for the development of an electronic marketplace for renewable energy devices and systems for ANERT. Advance and one part payment was released to Keltron vide papers read 4th and 5th above.

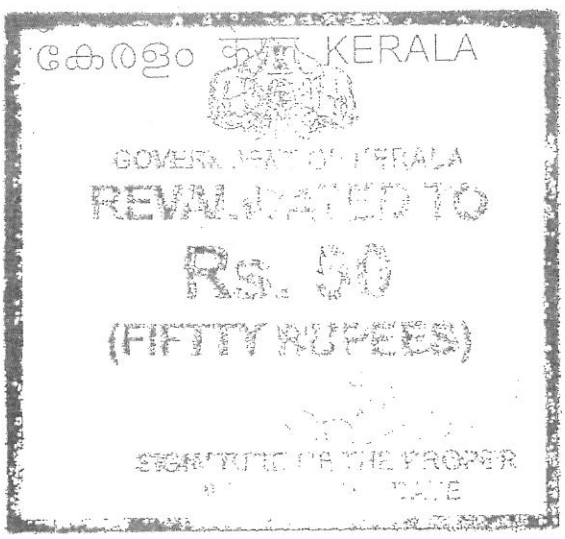
2. Now, Keltron has completed the work and the website was launched on June 5th 2018 by the Honourable Chief Minister. As per work order conditions, they have requested for the release of 40% of order amount as per invoice read 6th above.

3. In this circumstance, sanction is accorded for the release of ₹5,66,400 (₹4,80,000 [40% order amount] + ₹86,400 [GST]) (Rupees five lakhs sixty six thousand and four hundred only) as 3rd part

payment to Keltron for the Development of Online Market Place Application for ANERT. The expenditure may be met from the plan funds for eGovernance [Head of Account 2810-00-800-90(07)].

DIRECTOR

Accounts



00AA 716361

AGREEMENT

THIS DEED of Agreement executed on 3rd day of May two thousand and eighteen BETWEEN the **Agency for Non-conventional Energy and Rural Technology (ANERT)** hereinafter referred to as 'Purchaser' which expression shall wherever the context so permits means and includes its successors and assigns) represented by the Dr. Hari Kumar R (Name), Director, ANERT (Designation) on ONE PART AND the **Kerala State Electronics Development Corporation Ltd.,**

a Government of Kerala Undertaking, having its registered office at Keltron House, Vellayambalam, Thiruvananthapuram (hereinafter referred to as the 'Contractor' which expression shall unless the context does not admit, include its successors and assigns) represented by the Smt. Usha K, Head (SWG-ITBG), on the OTHER PART;

9-4-2018

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

6/4/2018

Kerala State Electronics Development Corporation Ltd.
(A Government of Kerala Undertaking)

CIN: U74999KL1972SGC002450

KELTRON
I. T. Business Group
ISO 9001 : 2008 CERTIFIED

Keltron House, Vellayambalam, Thiruvananthapuram-695 033, INDIA
Phone: 0471-4094444, Fax: 2724545, E-mail: itbg@keltron.org

ITBG/SWG/ANERT/180502/072

May 2, 2018

The Director,
Agency for Non-Conventional Energy and Rural Technology
Law College Road, Vikas Bhavan P.O.
Thiruvananthapuram
Kerala-695033.

Dear Sir,

Sub: Agreement (in original) for Online Market Place Application Development for Agency for Non-conventional Energy and Rural Technology (ANERT).

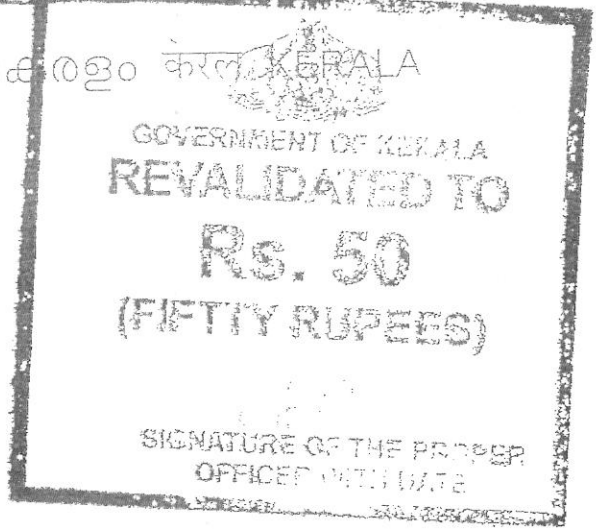
Ref: ANERT-TECH/223/2017 –S (PK) Dated 04.11.2017

With reference to the above, we are hereby submitting the agreement (in original) for the "Online Market Place Application Development" for Agency for Non-conventional Energy and Rural Technology (ANERT).

Kindly revert with a copy of the duly authorized agreement.

Yours faithfully
For Kerala State Electronics Development Corporation Ltd.

Usha K
Head (SWG)



00AA 716362

WHEREAS the Contractor has submitted proposal ITBG/SWG/IP/2017/008 dated 20.04.2017 for the **"Online Market Place Application Development"** for **Agency for Non-conventional Energy and Rural Technology (ANERT)**

AND WHEREAS the Purchaser has pleased to accept the proposal subject to the conditions stipulated in the work order No: ANERT-TECH/223/2017 –S (PK) Dated 04.11.2017 (This shall form part of this agreement as if incorporated herein).

NOW THESE PRESENTS WITNESS AS FOLLOWS:

No. 223
9-4-2018

1. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz

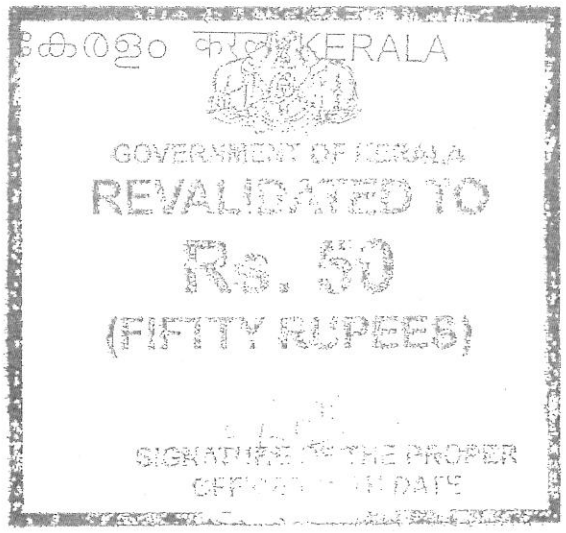
K.S.E.D.C. Ltd

- Terms and conditions of this Agreement
- Order No: -ANERT-TECH/223/2017-S (PK) Dated 04.11.2017

DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram

DIRECTOR
ANERT

6/4/2018



00AA 716363

• Proposal No: ITBG/SWG/IP/2017/008 dated 20.04.2017

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed above, this Agreement being the controlling document, unless otherwise specifically agreed by the parties in writing.

2. The Contractor agrees to conduct system requirement study to identify the details of the project.

No. 224 3 The scope of this project lies with the requirement analysis, design, software 9-4- development and implementation of Online Market Place Application.

K.S.E.D.C. Ltd

4. Requests for enhancement of rates once accepted can be considered where Purchaser have prior to the actual supplies, expressly agreed in writing for any price variation under

USHA
DGM (S/W)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

6/4/2017

भारतीय गैर न्यायिक

पाँच रुपये FIVE RUPEES

Rs.5

भारत INDIA

INDIA NON JUDICIAL

00AA 716364

KERALA

EVALUATED TO

Rs. 50

FIFTY RUPEES

specified circumstances. Conditions of sale or other special terms and conditions, if any, printed on the proposal of the Contractor or attached with the Contractor's offer or any other letter or paper from the Contractor will not govern this contract nor bind the Purchaser in any manner whatsoever unless such terms have been expressly accepted by the Purchaser in writing.

5. The Contractor will inform the configuration of necessary hardware to the Purchaser after signing the agreement. It is the responsibility of Purchaser to arrange hardware as per specifications/ configurations prior to the installation of software. Contractor will not be responsible for any delay in project execution, due to delay in procuring the requisite hardware.

225 50/-
9-4-2018

6. The Contractor agrees to complete the project milestones listed in the proposal. deliverables and services within the implementation period given in proposal. Maintenance of milestones of implementation schedule is closely linked to prompt feedback and document acceptance by the client. Any delay in project schedules due to

DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

DIRECTOR

6/4/2018

no fault of the client will be penalised at the rate of 0.1% of amount released against work completion for delay of each week to a maximum of 10% of amount released against work completion.

7. The ownership and responsibility of the domain name will be completely with the purchaser, the contractor will have no responsibility in the domain name and its availability.

8. The Contractor agrees that time is the essence of this contract. This agreement is valid from the date of order issued by the Purchaser and the term of this agreement shall be for a period of Twelve months from the date of execution of this agreement.

9. The Contractor concords to provide imparted knowledge about the new software to all users and stakeholders at the required level. The Contractor provides adequate documents and manuals. Training will be provided to ensure the proper use and operation of applications and infrastructure.

10. If the Contractor defaults in the supply of all or any of the items correctly and promptly as above, the Purchaser is at liberty to procure the same from elsewhere without canceling the contract as a whole. If Purchaser incur, in thus procuring such items at a higher cost than the agreed rate such excess cost may be deducted by the Purchaser from the Contractor's Bill or adjusted or otherwise realized from his security deposit or recovered from him by other means. The contractor agrees that he shall not be entitled to claim the excess, if any, of the offered rate over such cost to Purchaser.

11. If no formal response is given back to the Contractor within a period of 30 days after the customization of any module of the software, the software module shall be deemed as accepted by the Purchaser.

12. The developed software will be loaded in the Keltron server for a period of six months from the date of this agreement free of cost. After this period of time the purchaser shall choose any of the following options:

- The purchaser can host the application in Kerala State Data Centre
- The application software can be hosted in Keltron server according to mutually agreeable rates.

13. The total cost for the "Development of Online Market Place Application" for ANERT is **Rs 12,00,000/-** (Rupees Twelve Lakhs Only) exclusive of taxes.

14. (a) The contractor will raise invoices according to the completed work. The purchaser shall verify the completion of the work mentioned in the invoices and release amount as per the following payment terms,

i) 25% as advance along with the signing of the contract & Acceptance of SRS.
ii) 25% of agreed amount will be released after the completing design
iii) 40% of agreed amount will be released after the project go-live.
iv) Balance 10 % on successful completion of warranty support.

USHA K.
DGM (SWG)
II Business Group
Keltron, Vellayambalam,
Thiruvananthapuram-695033

All payments to the Contractor for satisfactory supplies will be made after scrutiny of Contractor's bills by drafts or cheques on Reserve Bank of India, State Bank of Travancore or State Bank of India (at any of their principal branches in India).

(b) The contractor will produce stamped pre-receipt/ invoices in all cases for release of payments.

15. Software is warranted for twelve months from the date of Commissioning after successful completion of the testing. All logical mistakes will be attended at free of cost during this period. Any changes in basic architecture may lead to additional cost and time. The change requests will be considered separately and will provide the estimates before beginning such tasks for which separate order will be issued.

16. Force Majeure shall mean and be limited to the following:

a) War / hostilities
b) Riot or Civil commotion
c) Earthquake, flood, tempest, lightening or other natural physical disaster.
d) Restrictions imposed by the Government or other statutory bodies which prevents or delays the execution of the order by the Second Party.

Completion period may be extended to circumstances relating to Force Majeure by the Purchaser. The Contractor shall not claim any further extension for completion of work before the said stipulated period. Purchaser shall not be liable to pay extra costs under any conditions.

17. Annual Maintenance Contract (AMC): Contractor is ready to give annual maintenance contract, after the warranty period on mutually agreeable terms, not increasing 12% of total development cost. It will not cover any modification that affects the Database or system Design.

18. The contractor agrees that any communication addressed to him may be handed over to him personally or place of business or may be sent by prepaid post to his address as mentioned in this deed. The acknowledgement of and all other communications regarding this order may be sent to the purchasing officer of the Purchaser who has placed the order.

19. In case the supply of software involves any defects the contractor agrees that the defects will be rectified within time. It shall also be the duty and responsibility of the contractor to see that the software thus corrected is in good working condition to the satisfaction of the person duly authorized by the Purchaser in that behalf and to ensure the proper functioning of the software. In the event of the failure of the contractor to remedy the defects within the time or in the event of the software failing to function properly during the warranty period, the amount spent by the Purchaser and the loss sustained by the Purchaser on this account by making alternative arrangements shall be recoverable from the contractor.

USHA K.
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

20. The Contractor agrees to ensure the integrity and authenticity of the entered data and to protect the same for ensuring data privacy.

21. Contractor will not disclose the contents of any documents, or transfer such knowledge of Purchaser, as revealed to Contractor during the course of the assignment, to any other organization without the prior written consent/approval of Purchaser.

22. If any dispute or difference of any kind whatsoever were to arise between the Purchaser and Contractor, the Purchaser may approach the Managing Director of Contractor. If the dispute is not settled between the Purchaser and Managing Director of Contractor within 30 days, the dispute can be referred to the Law courts in Trivandrum after giving due notice to the Managing Director of Contractor.

23. Any application software problems during warranty period will be attended within 24 hours of registering complaint in the following address: ITBG/Software KELTRON, Keltron House,Vellayambalam, Telephone No: 0471-4094444, Extn: (225)&(207), email:software@keltron.org and will be rectified within 48 hours. Any service calls on account of operations which are not in the scope of warranty terms of the contractor will be charged extra.

24. Modification /Amendment in this agreement can be done only with mutual written consent of both the parties;

USHA K,
DGM (SWG)
IT Business Group
Keltron, Vellayambalam
Thiruvananthapuram-695033

IN WITNESS WHERE of the Contractor, Smt. Usha K, Head (SWG-ITBG), for and on behalf of KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LTD and ..Dr. Harikumar R:.....(Name),..Director.....(Designation), the Purchaser, for and on behalf of Agency for Non-conventional Energy and Rural Technology (ANERT) has hereunto set their hands.

Signed, sealed and delivered by:

(Contractor)

Smt. Usha K, Head (SWG-ITBG) for and on behalf of Kerala State Electronics Development Corporation Ltd.

In the presence of witness:

1. Arun K.S, Sr: Engineer, Keltron

2. Devi S.S, Engineer, Keltron

Signed, sealed and delivered by:

(Purchaser)

AGENCY FOR NON-CONVENTIONAL ENERGY & RURAL TECHNOLOGY * ANERT TVM

.....Dr. Harikumar R:..... (Name), ...Director..... (Designation) for and on behalf of Agency for Non-conventional Energy and Rural Technology (ANERT)

In the Presence of witnesses:

1. K. Premkumar
   Scientist, ANERT

2. Krishnapriya.S
   Project Officer (IT), ANERT

അനുബന്ധം - 6

GOVERNMENT OF KERALA

Abstract

Power Department - ANERT - Deputation of Sri. Vinay.P, Research Fellow – Expost facto sanction accorded - Orders issued.

POWER (PS)DEPARTMENT

G.O.(Rt)No.150/2018/POWER Dated,Thiruvananthapuram, 13/08/2018

Read Lr. No.ANERT-TECH/183/2018-RF(RM) dated 27/06/2018 from the Director, ANERT

ORDER

Expost facto sanction is accorded for the journey performed by Shri. Vinay.P, Research Fellow, ANERT for attending the Review Meeting for Intra- State Transmission System (InSTS) Green Energy Corridor(GEC) Phases-I & II at New Delhi on 29/6/2018 by air in economy class subject to the condition that the expenditure in this regard will be met from the Service Charges (own fund) received from Ministry of New and Renewable Energy.

(By order of the Governor)
GOPAKUMARAN NAIR B
JOINT SECRETARY

To:

The Director, ANERT, Vikas Bhavan P.O., Thiruvananthapuram

Shri. Vinay.P, Research Fellow, ANERT

(Through the Director,ANERT)

The Principal Accountant General (Audit), Kerala, Thiruvananthapuram.

The Accountant General (A&E), Kerala, Thiruvananthapuram

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