

SEIAPI Registers in Fiji

The Sustainable Energy Industry Association of the Pacific Islands (SEIAPI) was established ten years ago but it became officially registered in Fiji under the Industrial Association Act (CAP95) (Regulation 4) on the 30th of April, 2020. This was after a long series of exploring avenues to have a regional association with some office bearers located in different countries in the Pacific region be registered in Fiji, which is frequently known as the hub of the Pacific. This initiative will enable SEIAPI to operate consistently within clear financial rules. The news was highly welcomed by the SEIAPI Executive Committee. With stakeholders suffering amidst the COVID-19 pandemic, SEIAPI is hopeful that it will proceed realising its vision and mission as the situation normalises. In the short and long term, SEIAPI wishes to carry out the following activities:

Short Term

- Establish a mechanism whereby all PIC national sustainable energy associations (Vanuatu, PNG, and others) are members of SEIAPI
- Develop and regularly update a database of all the energy departments, energy ministries, energy units, etc. in each Pacific Island Country and territory (PICT) with contact details, and then encourage all to become honorary members
- Develop data base of key donors (e.g. EU, DFAT, MFAT, GIZ, GGGI, etc.) and other development agencies (e.g. ADB, World Bank) actively working within the energy sector in the Pacific

Long Term

- Promote SEIAPI/PPA guidelines on Renewable Energy/ Energy Efficiency and accreditation/certification programs to the energy departments and donors
- Prepare newsletters every two-four months.
- Assist in establishing RE Training Centres in the Pacific
- Try to identify funding opportunities for SEIAPI and secure funding to deliver more training and capacity building to the industry members.

For more specific details on SEIAPI Planned Activities, follow article on 'SEIAPI Recent Achievements' and 'SEIAPI Workplan 2021-2022' included in this issue.



SEIAPI Recent Achievements



Caption: Participants of SEIDP 2019 Guideline Workshops Conducted in the Solomon Islands

The last few years, the SEIAPI secretariat has been busy with the Sustainable Energy Industry Development Project (SEIDP) and focussing on how to increase the availability of training courses within the Pacific countries for the SEIAPI members. This newsletter provides an overview of what has been achieved in these two areas along with the 2021-2022 workplan that has been developed by the SEIAPI Executive Committee

Sustainable Energy Industry Development Project (SEIDP)

In 2017, the World Bank provided funding to the Pacific Power Association (PPA) as the Project Implementation Agency for the Sustainable Energy Industry Development Project (SEIDP). In March 2018, GSES was awarded a contract by the PPA to provide the technical assistance services under Component 2 of SEIDP. The contract was completed in August 2020 with the following result:

- 4 existing technical guidelines were updated;

- 12 new technical guidelines were developed;
- 19 training unit standards were developed and approved onto the Pacific Register of Qualifications and Standards (PRQS); and
- 633 different people attending at least one of the thirty-two (32) 4-day workshops that were conducted in 12 countries.

The 16 technical guidelines that were published are all available from the [SEIAPI website](#).

The details on 19 training unit standards that were accredited by the Pacific Board for Educational Quality under the Pacific Register of Qualifications and Standards (PRQS) are all available from the [SEIAPI website](#).

The guideline workshops covered the various guidelines that were published. These were conducted in Fiji, FSM (Chuuk, Kosrae, Pohnpei and Yap),

Kiribati, Nauru, Palau, PNG (Port Moresby and Lae), RMI, Samoa, Solomon Islands, Tuvalu, Tonga and Vanuatu. In addition, 2 workshops were conducted in Cook Islands funded by TAU (Rarotonga Utility).

GIZ ¹ Funded Licence Agreement between PPA and GSES for training resource material

A license agreement was signed in 2019 between PPA and GSES funded by GIZ. Under the agreement, PPA has the license to the material and it allows GSES then to sign one-on-one agreements with Pacific training centres to have access to the material.

Resource Material Provided Under Agreement

The following training resource material is available under the PPA/GIZ agreement with GSES.

¹ The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Course – skillset	Duration of course – Days ³
Grid-Connected PV Systems - Design & Install (GC PV)	10 (15)
Grid-Connected PV Systems with Battery Storage - Design & Install (GCwB) ¹	10 (13)
Stand Alone Power Systems (Off-grid) Design & Install (SAPS)	15 (18)
Hybrid Systems - Design and Install (HS) ²	5 (8)

Notes:

1. Successful completion of GC PV is a prerequisite to participating in GCwB.
2. Successful completion of SAPS is a prerequisite to participating in HS.
3. The days are only indicative. GSES has prepared other agendas for making the courses longer and these are shown in brackets. However, the trainer's

guides are based on the number of days not shown in brackets.

The following course materials are supplied in respect of each complete course/skillset:

- Course Agenda
- The lectures (PowerPoint presentations)
- In class exercises/tutorials
- Practical session activities, descriptors and outcomes
- Assessment sheets
- Assignments
- Examinations
- Trainers' guide

Development of Training Centres

Under a separate contract with GIZ via SPC (for Pohnpei) and the Solomon Islands, GSES conducted train the trainer courses in Pohnpei (Micronesia Community College) and Solomon Islands (Solomon Islands National University) between January and March 2020.

GIZ also funded the equipment for Micronesia Community college (grid connect only) and Solomon Islands National University (all 4 courses). GSES/SEI-API will continue working with these 2 centres to help them conduct training in the future.



Caption: Training Set-up at SINU (Solomon Islands)

SEIAPI Workplan 2021-2022

Global Sustainable Energy Solutions Pty Ltd (GSES) has been acting as the Sustainable Energy Industry Association of the Pacific Islands (SEIAPI) Secretariat since 2012.

For SEIAPI to be effective it requires a Secretariat with at least one fulltime technical person and a part time admin person. Over the next 2 years, SEIAPI will be identifying the revenue streams to make this plan sustainable.

SEIAPI plan to build on the outcomes of the SEIDP and also the license agreement GSES has with the PPA for the training resource material for 4 courses. In particular, SEIAPI aims to:

- Develop a funding proposal to establish solar training at existing training centres in

more countries to facilitate more people being able to apply for PPA/SEIAPI certification.

- Review and update the guidelines for the PPA/SEIAPI certification/accreditation program.
- Apply to have PPA/SEIAPI accredited as a certification body in accordance with ISO 17024 -Conformity assessment -General requirements for bodies operating certification of persons.
- Promote the technical guidelines developed under SEIDP and the PPA/SEIAPI certification/accreditation program to relevant country

government departments, donors and also the PPA member utilities. The objective is that it becomes mandatory that all systems installed either within that country, their electrical Transmission and Distribution network or within a relevant funded project are designed and installed by a certified technician (and accredited company) in accordance with the appropriate guidelines and if applicable the relevant standards (Australian/ New Zealand or United States National Electrical Code - NEC).

SEIAPI is an official supporter of the SWC50 - The Century of Solar

In 1970 solar research pioneers met at the first International Solar Energy Society (ISES) Conference in Melbourne Australia. ISES commemorated this conference with a special 50th Anniversary Virtual Conference and Display, called the Solar World Congress at 50 (SWC50), that was held on 3-4 December 2020. More than 800 attendees from 76 countries joined the six sessions. SEIAPI Executive Committee members had approved SEIAPI as an official supporter of the SWC50. Interestingly, the secretary for SEIAPI, Mr Geoff Stapleton is also the Chairman of the Organising Committee for SWC50. Due to the restrictions in

place amidst COVID-19 pandemic, all sessions were delivered online.

The SWC50 highlighted the transformation in the global energy sector that has taken place since the 1970 ISES Congress and looks forward to the next 50 years when renewable energy will be the major cornerstone of the global energy system. The Conference was about the people: researchers, industry players, policy makers, and leaders from NGOs and non-profits who have all contributed to make renewable energy the fastest growing contributor to our global energy supply.

The SWC50 celebration continues throughout 2021 with monthly newsletters and two webinars to be held later in the year.

The booklet: ISES SWC50: The Century of Solar - Stories and Vision and the online museum: ISES Solar Energy Museum - Past Present and Future are available from the links respectively:
<https://www.ises.org/swc-50-celebratory-booklet>
<https://www.ises.org/ises-solar-energy-museum>

Nakoro Village Rural Electrification Project Commissioned in Fiji



Caption: Nakoro Village Hybrid Power System

A remote village of Nakoro in Fiji was recently electrified through a PV/Diesel Hybrid System in August, 2020. The new hybrid solar power system was installed by Sunergise and engineering subsidiary, Clay Energy in the Province of Navosa. Nakoro is four hours drive from Suva, on the Western Side of the island of Viti Levu, and far from the Energy Fiji Limited grid. The power system delivers electricity to over 40 homes, the village church and the village Health Centre.

Speaking at the official opening, the Prime Minister - Hon. Voreqe

Bainimarama stated that 'The terrain and relative isolation of the village had made it prohibitively expensive to extend the national electrical grid to it. But we are determined to meet our objective of ensuring that all Fijians have access to reliable electrical power by 2021, to have 100 percent renewable energy in Fiji by 2036, and to achieve net-zero emissions by 2050.'

The FJ\$1M implementation is part of the Fiji Sustainable Energy Hybrid Power Project (FSEHPP) and features a SMA Sunny Island AC Coupled Hybrid system with 51kWp of ground-mounted PV in

combination with 60kVA Cummins Diesel Generator and 200kWh battery storage. Power is reticulated underground; buildings are internally wired and consumer metering is via wireless smart meters with a central server and online monitoring.

The project has been achieved through a funding support by the European Union to the Fiji Government. The system has been installed by SEIAPI Member – Clay Energy.

Success Story of MV Solar ATS Project (Fiji)

In November 2018, MV Solar Fiji was awarded the tender to design, supply and install a 174.98 kW grid-connected photovoltaic system at the Air Terminal Services, Flight Catering Centre Building at Nadi Airport, Fiji.

The system was designed by Mr Michael Valentine who is the Owner & Managing Director of MV Solar Group. The project team consisted of specialists and technicians from the MV Solar Fijian and Australian Offices led by Mr Michael

Valantine, while head installer for MV Solar, Mr Tim Valentine managed the onsite installation team. Mr Michael Valentine's extensive background in the solar and renewable energy sector, both in Australia & Fiji, was the backbone behind the successful design and completion of this project.

The special features of the system include the following:

- Products used are compatible with the harsh weather conditions in Fiji and in the South Pacific. The products are durable and rust resistant.
- A total of 673 Winaico solar panels were installed that are capable of withstanding up to 318 km/hour (typhoon conditions).
- Enphase Micro-Inverters were used to

monitor and report on energy production and performance of the system, 24/7. The system performance can be monitored at any time and from any location in the world. It is efficient, low maintenance and trouble-free.

- The photovoltaic system installed is cyclone (Cat 5) certified.

MV Solar and ATS worked tirelessly to achieve this. The company is very proud of their achievement and grateful to Air

Terminal Services for having confidence in MV Solar and taking the step to embrace greener, cleaner energy, supporting Fiji's COP23 Climate Change Goals.



Mr Hari Mani - CEO, ATS & Mr Michael Valentine MD, MVS Solar Fiji signing the contract



Caption: ATS Project Installation Works

Technical Tip

Sizing Battery Cable Protection (Battery Inverter)

To select the appropriate battery protection for the cable to the battery inverter:

1. Obtain the battery inverter manufacturer's data for:
 - Continuous power rating (Watts)
 - 3 to 10 second surge rating (Watts)
 - Average inverter efficiency (%)

2. Obtain Time-Current characteristics for the overload protection to be used.

[All manufacturers publish time-current information for their circuit breaker and high rupturing capacity (HRC) HRC fuse ranges]

3. For each inverter power rating determine the current drawn from the battery bank using:

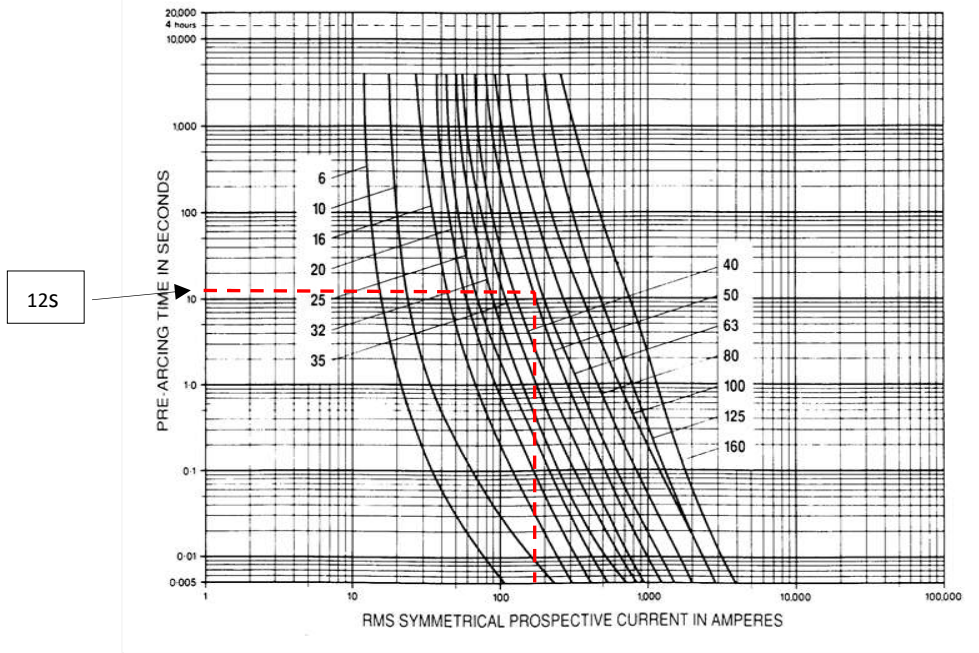
$$I = \frac{\text{Inverter Power Rating (W)}}{\text{(inverter efficiency x nominal battery voltage)}}$$

4. Consult the Time-Current characteristic of available overload protection devices to determine the device with an appropriate rating that matches the maximum load and maximum load surge characteristics.

Example

An inverter is rated at 1200 VA continuous, surge rating of 2400 VA. The inverter input voltage is 24 V. Inverter efficiency is 90%.

Type NHG 00
Time/Current Characteristics
6 - 160 Amp



Time/current characteristics for DIN Standard NHG 00 General Purpose Fuse Links - GEC ALSTHOM

The continuous current using (3) above is 55 amps, surge current is 111A. Fuses tend to hold their 1.1 x rating continuously. Let's look at the 50A fuse. It is below the continuous current (55A) but it would hold that current continuously- it is very unlikely in real world to hold the continuous current for hours - the batteries would be flat by then. It would meet the surge by holding for about 12 secs. So, the 50A Fuse would be sufficient, you could also use the 63A it would meet all the requirements, however always ensure that the current carrying capacity (CCC) of the cable used should be higher than the fuse rating. Therefore, before sizing the battery protection, the cable size and it's CCC should be known.



For more updates, please visit <http://www.seiapi.com> or email on infor@seiapi.com or secretariat@seiapi.com for any queries and comments