

Dear Readers,

Greetings from CEEAMA E-News Committee.

CEEAMA GC is extremely delighted by the overwhelming response given by all of you, in making CEEAMATECH 2020 conference on **"RELEVANCE OF INDUSTRY 4.0 for ELECTRICAL ENGINEERING PROFESSIONALS**", a grand success.

The Jade ball room of hotel Sahara star was "House-full" with delegates from various industries which included Patrons, Life members, associate members and equal numbers of non-members. The keen interest shown by attendees, made the sessions very interactive. Interesting & thought-provoking questions were raised during Q&A to get insights of the Industry 4.0. Even the eminent speakers were pleasantly surprised with the quality of dialogue for comparatively new topic for Electrical professionals in India. None the less every one was convinced that the industry 4.0 is the future of electrical industry.

CEEAMA has obtained feedback from esteem members on the outcome of exhibition. It is encouraging and CEEAMA GC committee will take note of it to improve in future.

The success of industry 4.0 will go a long way in boosting the moral of the CEEAMA GC to start working in right earnest to make CEEAMATECH 2021 which will be a 3-Day exhibition to be held in Pune. On behalf of GC we urge each and every member, to contribute their invaluable services for yet another successful event.

In order to make E-news more informative, thought provoking & valuable, please keep sending your articles to us

Editor committee

Article : Smart Motor-The first step toward the digitalizationArticle : Roof Top Solar and Billing Policy in MaharashtraPast Event: CEEAMATECH - 2020, 8th Conference on 8th February 2020, At Hotel Sahara Star, MumbaiUpcoming Event: Round Table conference at Kolhapur.



Reader's Forum

In response to the secretaries' message in the January 2020 E-News appealing readers to send their suggestions for improvement and technical queries, which can be part of future E-News.

Few readers have sent us technical questions related to practical problem faced in their day to day activities in Electrical industries. We encourage more and more readers to be part of E-News and send us not only questions but also their thought on to such practical questions. Our motto is to spread knowledge of experienced electrical veterans to the benefits of novice practitioner in Electrical industries and future Electrical Engineers.

The following practical technical questions raised by few readers;

Question-1

Dear Sir,

My Question is "When is the use of "control transformer" for control circuit recommended?"

Question-2

Dear Editor,

A great news in your Newsletter of January was formation of an interactive "Readers Forum" where questions can be asked and clarified by the editor. My question is

We have a pump set fed from a MCC which is far away. Sometimes when the local stop button is pressed the motor does not stop. We have checked and changed the push button station and cable; bur to no avail. The problem persists. Kindly enlighten us on the reason and give us a solution

We will provide answers to above practical technical questions in the next month's E-News. Keep reading & send us more and more challenging questions.

We would like to hear from you on followings by writing to us at admin@ceeama.org

1) Feedback on this issue.

2) Suggestions for new topics you would want to be discussed in ENEWS

3) Your own article to be published in E-News.

CEEAMA Consuling Electrical Engineers Association Mahamshira

Smart Motor

The first step toward the digitalization



The future is digital – including in the industrial sector. Thanks to digitalization and networked processes, companies can produce more flexibly and reliably, and they can respond to events more rapidly. Digitally enhanced drive components are an important step toward digitalized automation. The next generation motors not only need to be energy efficient but also smart and digitalization ready. Siemens digitalization portfolio which opens a wide-ranging scope for IoT (Internet of Things) optimization across the entire drive train – from production through to servicing.

Concept behind Smart motor:

A concept of making a motor smart is basically using a sensor box (SIMOTICS Connect 400) on existing motors that allows regular data analysis to quickly and efficiently oversee the operational status of the motor and plan a servicing schedule based on actual requirement. This not only improves efficiency, but also optimizes



serviceability and extends service life. Typical applications requiring monitored low-voltage motors include pumps, fans and compressors.

The connectivity module comes with all the sensors required for capturing motor vibration or temperature-related data, a WLAN communication module and a battery to enable independent operation. The module processes and saves the operating data and sends it to the Sidrive IQ Fleet App for cloud-based analysis. Special algorithms use the data to generate meaningful key performance indicators (KPIs) which describe the status of the motors and are used to determine any concrete need for action. In future, it will be possible for existing motors operating in the field to be retrofitted with the Simotics Connect 400 connectivity module to improve reliability and availability and boost performance.

By continuously monitoring power, torque, Vibration, slip and measuring energy flows, users can identify any optimization and maintenance requirement and so initiate any necessary actions in good time. This reduces the need for fixed-interval maintenance, making for greater machine productivity and identifying energy saving potential.

Many types of mechanical and electrical irregularities/anomalies in the equipment affect the motor's parameters. Advanced technologies employing artificial intelligence and machine learning principles builds a model for how each motor normally function across a range of operating conditions. These advance technologies detect irregularities and issue alarm providing early warning of developing problems.

Benefits:

- Optimization through digitalization: Increase process transparency and optimize your service activities with the digital pioneer.
- Best-in-class-design: Compact and future proof design for higher power density at comparable power output and flexibility when installing.
- Future-oriented energy efficiency concepts
- Improve machine utilization and performance:
 - performance benchmarks to compare motor conditions for similar applications in various locations
 - o optimize machines based on performance indications
- Increase plant availability

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- Prevent unplanned downtimes by continuously knowing motor condition
- Realize cost savings in energy consumption and maintenance
 - React on KPI changes & schedule maintenance based on motor health, planned plant downtimes and staff availability
 - \circ Realize energy savings with performance based
- Gain transparency of equipment anywhere and 24 / 7
 - Availability on mobile devices
 - Complete machine park on one single screen
 - o Warnings based on adjustable KPI thresholds

Highlights of smart motor:

- First step towards world of digitalization Industry 4.0
- Seamless Connectivity to Motors via MindSphere
- No further hardware required and hence to additional cost
- Automated data transfer. Works directly on any Wi-Fi
- Evet based scheduling
- Access to remote device for data analytics and predictability
- Monitoring of motors health & performance
- Plug & play commissioning of connectivity

Article by : **Snehalkumar Vatkar** Siemens Ltd.. RC-IN DI MC LVM BD Mumbai

CEEAMA Consulting Electrical Engineers Association of Maharashtra

Roof Top Solar and Billing Policy in Maharashtra

Solar energy : Proposed Change in policy of Net Metering/ Net Billing in Maharashtra

There was petition from MSEDCL to MERC to make a change in policy relating to Net Metering and Net Billing system Tariffs relating to consumers who have installed Roof Top Solar and generate more than 300 units.

Net Metering System .

Under this system The Roof Top solar energy generated by consumer at his premises is set off against the energy consumed by him on a monthly basis and then the final bill is issued to him.

Net Billing System

Under this system The Roof Top solar energy generated by a consumer is purchased by Discom at an approved grid Tariff , while the same consumer purchases power from Discom at the agreed tariff with Discom .

Minimum size of solar Energy under the Net Metering and the Net Billing system would be 1 KW.

Change of Tariff policy was proposed in the above system by MSEDCL. Those who generate more than 300 units /month will not be eligible for Net Metering. This means that electricity generated more than 300 units /month will have to be sold to Discom i.e. MSEDCL at the generic rate of Rs 3.64 /unit. The charges for the electricity purchased by consumer more than 300 units, need to be paid by him at existing Tariff of MSEDCL i.e. about Rs 11.18 rs /unit. This amounts that those who install Roof Top Solar, the place and expenditure of repayment of Loan burden etc. will be on the consumers but the electricity generated in excess of 300 units will belong to MSEDCL. For the allowed.

The result of this situation will be that individual consumers will be discouraged to install more than 2.5 to 3 KW on Roof Top. This move is against the interest of the consumers who install Roof Top Solar. However this will be in favour of MSEDCL since they can buy cheap solar power and continue to make profit by selling at higher rates to Industries and other commercial consumers. Industries and commercial consumers will continue to suffer and pay high energy Bills. This will result in stopping the progress of Roof Top Solar Installations.

MERC revised the regulation

MERC did not accept the MSEDCL petition , and after looking at the resentment in the media and opposition of large section of Roof Top solar generating consumers , **took decision to amend the regulation** and eased the situation for consumers having demand up to 300 units.

AS per the revised regulation, MERC have eased the situation to the extent of 300 units of solar Generation as follows.

Net Metering

Case 1) Let us consider Energy Requirement of consumer as Er = 850 units and energy generated by Solar Roof Top as E sg = 500 units.

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As per the old practice the consumer would have been billed for (850-500) i.e. 350 units and he would have utilised his total soar generation.

As per new system out of 500 units generated first 300 units will be set of against Er of 800 units. And consumer will be billed for 550 units . From 500 generated units, balance 200 units will be purchased by MSEDCL at the generic Tariff rate which is about Rs 3.64 and credit will be given to consumer in the same bill. As a result of this consumer will be paying to MSEDCL for 200 units at higher rate which will be say about 11 rs/unit . He will be paying 11-3.64 = 7.36 rs /unit , more for 200 units i.e. loss of Rs 1472.

Case 2) Consider Reduced demand of consumer than his solar generation . Er = 250 units and E sg = 500 as in case 1 .

Consider the first 300 units out of 500 units. Now the generation of 300 units is more than demand of 250 units. Therefore the 50 units will be banked with MSEDCL. The remaining 200 units above the first 300 units will be purchased by MSEDCL at generic Tariff as in case 1 and the amount will be adjusted in the same bill. The additional amount will be given credit for the next month.

Net Billing: In this case, Energy Bill of consumer will include The fixed charges, other applicable charges and levies, energy consumption of consumer will be charged at applicable Tariff and credit for generated solar power will be given at generic tariff as approved by MERC. Among the other charges MSEDCL is suggesting excessive Grid Support charges in their new petition to MERC. With these charges they want to totally take out the relief given by revised regulation of MERC. It appears that MSEDCL wants to do away with Net Metering and ask consumers to avail only Net Billing.

In simple terms MSEDCL does not encourage the Roof Top Solar Generation.

It is commonly well known that the Roof Top Installations have following benefits.

- i) Reduction in Transmission and Distribution losses since the energy is produced and consumed in the same Location.
- ii) No need of land for these projects since Roof Top is used.
- iii) Solar Power does not need Water for electricity Generation and also that it will reduce Pollution which would have been caused by conventional Thermal source .

Only problem appears that the revenue of MSEDCL is affected and they loose their customers. .

Present situation.

As per EA 2003 every consumer has the right to install and generate Electricity using any source for self consumption. The above policy suggested by MSEDCL would deprive consumer of this choice. National Solar Mission India has made policy to install upto 40000 MW of RT Solar power in India and out of this 4000 MW was expected in Maharashtra State. Out of this Target of Maharashtra, so far installed capacity is only 266 MW which is a very small percentage. In Maharashtra about 5000 Small Scale Industries and so many workers are dependent on RT Solar Generation. Roof Top Solar Generation progress will affect the work force in this sector . The above policy if implemented would also affect Industries , commercial and Residential consumers who generate Solar Power on Roof Top .

MSEDCL's present Petition for Tariff rise.

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MSEDCL has made petition in Mid January 2020, to MERC for Tariff revision for next five years. MSEDCL claims that the demand has gone down due to Roof Top Solar power generation by consumers resulting in loss of revenue. They claim that they had taken steps to augment the distribution network to meet the demand. So they have now proposed the Grid support charges which are close to rs 4/unit, and higher in some cases to recover their financial losses. The consumers were benefitting from the net Metering facility as explained above. The consumers now stand to loose the benefit they use to get by generating the solar power at lower rates as compared to high Tariff of MSEDCL. The consumers with demand upto 10 KW are exempted from the Grid support charges. There is proposal for rise in additional Demand charges close to rs 4/unit and Fixed charges of Rs 645/KW/month for the consumers who have not opted for Net Metering or Net Billing.

The Tariff policy approach of MSEDCL appears to be against National Policy of reaching Targets of 100GW of solar. The proposed Tariff rise will meet stiff opposition from consumers in the Public Hearing . We will await further decisions of MERC on the petition of MSEDCL for the Tariff Rise.

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