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In Conversation: Sanjay Banga, President – T&D, Tata Power

Expert View: Challenges and trends in modern APFC systems

Achievement: India's first synthetic ester oil-filled transformer

Special Report: Transmission line addition surpasses target in FY21



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It is better to conquer yourself than to win a thousand battles

— *Buddha*

India needs to boost short-term electricity market

The short-term (ST) electricity market was just around 10 per cent of India's total electricity consumption in FY21. This metric has not seen much movement since the past decade.

Further, energy exchanges like Indian Energy Exchange (IEX) and Power Exchange of India (PXIL), today account for over half of the ST market. This share has however steadily moved up over the past 6-7 years.

Other options in the ST market include electricity transacted through traders, electricity transacted directly between discoms and electricity transacted through the Deviation Settlement Mechanism (DSM). The DSM route has been available since 2014 but it is not very popular due to strict regulatory directives. It may be mentioned that DSM is meant to be used as a last-minute resort to achieve grid stability. Allegedly, discoms were using it as a general trading platform, hence the strict regulations.

Most of the power purchase agreements signed in recent times have been in the solar power industry, and that too these agreements come with a 25-year period. Same is the case with wind energy.

This is the reason why there is very little renewable energy left for trading on power exchanges. However, there is some hope given that Indian power exchanges have started new mechanisms like Green Term Ahead Market (GTAM). Measures like these are bound to have a positive impact on the volumes of renewable energy traded on power exchange, and ultimately on the overall trading volumes on power exchanges.

Tariffs of renewable energy are falling. However, power discoms continue to buy expensive power from conventional power plants for two reasons. One is that the discoms are bound by long-term PPAs and two, there is not much liquidity on power exchanges, insofar as renewable energy is concerned.

Eventually, India must look at a culture where the short-term market has a healthy proportion in overall consumption, and much of this ST market comes from power exchanges. Today, the volume of electricity traded on power exchange accounts for a mere 6 per cent of India's total electricity consumption. In developed countries, power exchanges have evolved and matured. In Germany and UK, for instance, power exchanges account for around half of the total electricity consumption.

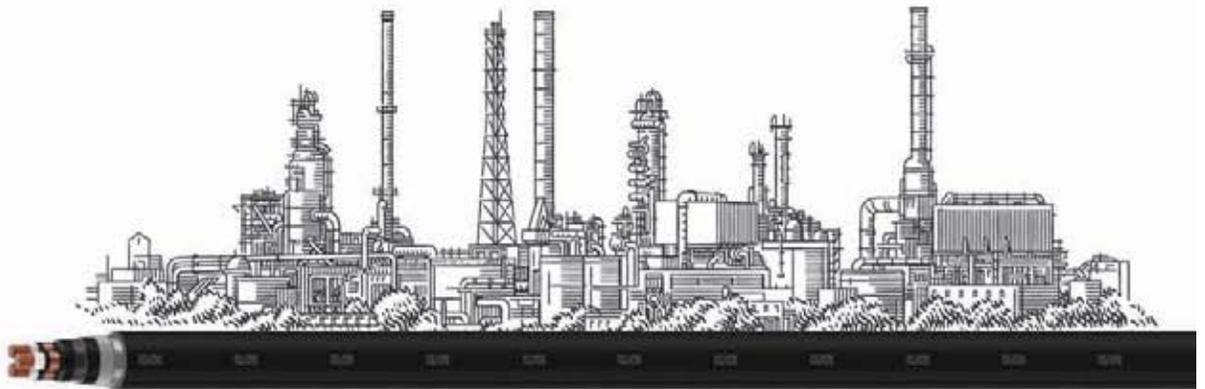
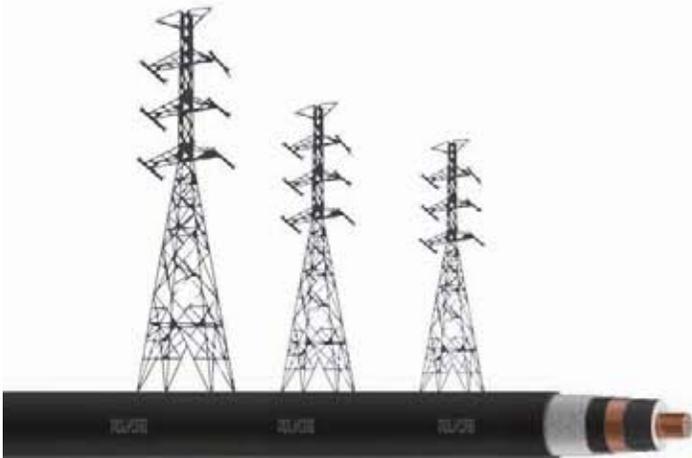
India also needs to review its policy with respect to PPAs. Due to the rapidly evolving dynamics of the power trading market, the current standard duration of 25 years for a PPA appears anachronous.

On the brighter side, the government has allowed discoms to exit from their long-term PPAs with Central power generators, after their expiry. This will give them flexibility to sell power freely. Whether they sell it to other discoms or trade on exchanges, this move will boost the short-term electricity market.

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CONTENTS

T&D News	8
Expert View: Challenges and trends in modern APFC systems.....	12
Achievement: AEML commissions India's first synthetic ester oil-filled transformer	14
New Launches	16
Policy News: Mandatory annual energy audit for power discoms.....	18
In Conversation: Sanjay Banga, President - Transmission & Distribution, Tata Power	20
Orders & Contracts	24
Profiles: ERDA, Sinerco Power Systems, Electronicon	26
Special Report: Transmission line addition surpasses target in FY21	28
Photo Feature: World's largest electric two-wheeler charging network.....	30
Innovation: World's first power transmission solution with holistic cloud connectivity	31
International News	32
Policy News: PLI scheme for advanced battery storage.....	33
Special Report: Transformation capacity addition falls 16pc in FY21	34
Renewables	35
Power News	36
Special Story: Vestas retains global wind market leadership	37
Special Report: Power generation sector highlights of FY21	40
Short Takes	41



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Interconnection point of Indo-Bangladesh link may not be shifted

The National Committee on Transmission (NCT), in its latest meeting, has ruled out further deliberations on the proposed changes to the Indo-Bangladesh power link, via Tripura.

There was a proposal to shift the interconnection point of the 400kV double-circuit Comilla (Bangladesh)-Surajmaninagar (Tripura) line from Surajmaninagar substation of Tripura State Electricity Corporation Ltd (TSECL) to the 400/132kV Surajmaninagar ISTS substation. There was also to be addition of two 132kV line bays at Surajmaninagar (ISTS) substation, making the entire transmission line as an ISTS scheme.

The Surajmaninagar (ISTS) substation is part of "NER-II



Photograph relates the Indo-Bangladesh HVDC link that can facilitate transfer of 1,000 mw.

Transmission Ltd", a TBCB scheme developed by Sterlite Power but now sold to India Grid Trust (IndiGrid).

The proposal to undertake the aforementioned changes was discussed at several meetings of the North Eastern Regional Power Committee (NERPC). The proposal was to be implemented, subject to approvals, after the extant power sale agreement between TSECL and Bangladesh Power Development

Board (BPDB) expired in March 2021.

It may be mentioned that TSECL has been supplying 160-mw of power to Bangladesh, through the 400kV double-circuit Comilla (Bangladesh)-Surajmaninagar (TSECL) line under a five-year agreement that expired in March 2021. It may be noted that the said 47-km line, though of 400kV rating, is currently operated at 132kV.

It was recently communicated by Central Electricity Authority (CEA) that the Union power ministry was keen to renew the power sale agreement for a period of another five years. Hence NCT has ruled out further deliberations on the issue.

Rationale of shifting: The idea was to shift the interconnection point from Surajmaninagar substation of TSECL to the Surajmaninagar substation under the ISTS project falling under NER-II Transmission Ltd. The rationale was that the Indo-Bangladesh link then would have become part of the ISTS network, and hence it would enable states to export their surplus power to Bangladesh. It would also have brought the ISTS (Interstate transmission system) scheme under the jurisdiction of North East Region Load Dispatch Centre (NERLDC) and consequently National Load Dispatch Centre (NLDC).

This plan was under discussion since 2019 but to save the interest of Tripura, which was in the midst of the five-year power sale agreement, it was decided to implement the plan after the expiry of the agreement in March 2021.

However, now that the sale agreement is most likely to be renewed, National Committee on Transmission (NCT) has ruled out further deliberations on the issue.

Apart from the 160 mw that Tripura is exporting via the Surajmaninagar-Comilla line, Bangladesh is also importing 1,000 mw through an HVDC link, commissioned in 2013 but subsequently expanded. ■

JSW Steel proposes CRGO steel mfg unit in JV with JFE

JSW Steel, in a statement announced that the MoU signed with JFE is for jointly conducting a feasibility study to establish a facility for manufacturing and sale of grain oriented electrical steel sheet, in India.

The plan is to complete the study within the current fiscal year (which is by March 31, 2022) and to take appropriate steps to set up the joint-venture company subject to requisite approvals.



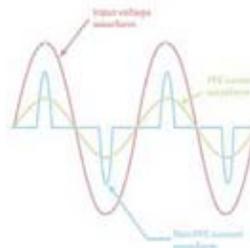
The MoU between JSW and JFE for CRGO steel takes the association between the two companies even further.

In 2009, the two companies signed a comprehensive strategic collaboration agreement under which JFE Steel took an equity stake in JSW Steel, and has provided technical cooperation with regard to automotive steel products.

In 2012, JSW and JFE entered into an agreement where JFE has provided technology for the production of non-oriented electrical steel sheets, which has enabled JSW to become India's leading supplier in this field. Non-oriented electrical steel is also known as cold-rolled non-grain oriented steel or simply CRNGO.

CRGO steel is a highly specialized form of steel that has excellent magnetic properties due to which it is highly useful during the manufacture of electrical equipment, primarily transformers. CRGO steel exhibits properties like high magnetic flux density and low iron loss, and is therefore used in transformer cores. CRNGO steel, on the other hand, finds application in iron cores of generators, motors, electrical appliances, etc. ■

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CEA constitutes committee for steel pole structures

Central Electricity Authority (CEA) has constituted a technical committee for formalizing standard technical specifications for steel pole-type structures.

The committee will function under the chairmanship of Chief Engineer (Power System Engineering & Technology Development), CEA.

The committee comprises members from steel pole manufacturers, Central Power Research Institute, state electricity regulatory commissions, power utilities, etc.

The objective of the committee is to prepare standard technical specification for steel pole type structures considering the wide acceptance of steel tubular poles as an alternative to lattice structures, by Indian utilities.

In some applications, steel pole structures prove better alternatives to lattice towers due to less geographical footprint, lower right-of-way (RoW), better aesthetics and



higher reliability under extreme weather conditions. For instance, steel pole structures are known to show smaller bending movement at the base, even under heavy load conditions.

Currently, there are no national standards covering design and erection of steel pole-type transmission towers.

The advantage: A note by CEA says that the standardization will help power transmission utilities, transmission service providers as well as manufacturers to get products of similar quality and reliability. Besides, CEA avers that due to the subject standardization, product quality will be uniform also resulting in faster delivery.

Draft standards: Based on various meetings held by the technical committee and inputs received from various stakeholders, the draft standard technical specification has been prepared. CEA is in the process of inviting comments and inputs from stakeholders on the draft standards. ■

Salasar Techno starts work on Rajasthan orders

Salasar Techno Engineering has started work on its recently secured power transmission lines contracts in Rajasthan.

Work on the contracts begun on April 20, 2021, a company official told T&D India, and the contractual completion date is around end-July 2022. State power utility Rajasthan Rajya Vidyut Prasaran Nigam Ltd (RRVPL) placed orders worth Rs.48 crore on Salasar for the construction of 220kV and 132kV transmission lines in the state.

The first order, worth Rs.20.25 crore, envisages two lines: Saipau—Maniya, and Saipau—Rajakhera. The second order, valued at Rs.27.45 crore is for the Reodar – Sirohi line. The transmission lines envisaged in both the orders aggregate around 121 km.

Commenting on the new orders, Shashank Agarwal, Managing Director, of Salasar Techno Engineering Ltd said, “The construction of new transmission lines in Rajasthan makes us a significant contributor to the national agenda for facilitating integrated and development infrastructure for overall growth.”

The scope of works for Salasar Techno encompasses supply all equipment and material, erection (including civil work), testing, and commissioning on supply on EPC basis.

Discussing the project execution challenges, especially in the current pandemic situation, a senior Salasar Techno official told T&D India that lockdown enforcement could cause logistics-related problems hindering raw material acquisition. Mobilizing labour could also pose a challenge, the official felt. Salasar Techno Engineering has wide experience of executing power transmission projects in Rajasthan given that its first power transmission EPC project was successfully completed way back on 2010.

KEC to complete balance works of Warora-Kurnool project

KEC International announced that it has signed an agreement for completion of balance works on the Warora-Kurnool transmission project.

In a media release, KEC International said that it has signed novation agreements with Warora Kurnool Transmission Ltd (WKTL) to complete the balance project work of the Warora-Kurnool transmission scheme. The works, valued at Rs.477 crore, involve transmission lines in the states of Andhra Pradesh, Maharashtra and Telangana. Project execution work is expected to start shortly, KEC said.

WKTL is now a subsidiary of Adani Transmission Ltd (ATL) following definitive agreements signed between ATL and original developer Essel Infraprojects Ltd. The agreements, formalized on March 26, 2021, envisage acquisition of WKTL by ATL for a total consideration of Rs.3,370 crore.

The Warora-Kurnool transmission scheme is currently under implementation but there have been project delays. When the project was awarded to Essel Infraprojects in around July 2016, the envisaged completion date was November 2019. However, the project is now targeted for completion by March 2022.

The project was severely impeded by right of way issues in coal-bearing areas of Western Coalfields Ltd (WCL) and Singareni Coal Collieries Ltd (SCCL). It is further learnt that a joint meeting between all stakeholders was held in January 2020, and it was decided that the project developer (WKTL) will complete the balance works—mainly 16 towers in the disputed coal-bearing areas—without further delay. ■

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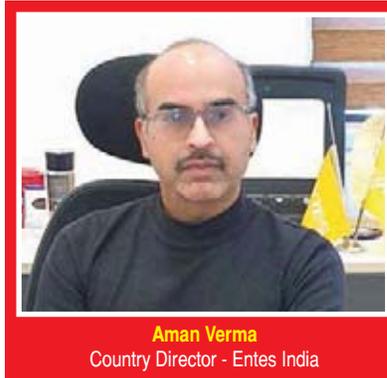


Passive Filter

Challenges and trends in modern Automatic Power Factor Correction systems

APFC systems are very much integral to Power distribution systems ensuring reactive power compensation in Industrial and commercial establishments and there has been a lot of focus by all utilities as well as engineering organisations to impart adequate awareness amongst customers to incorporate appropriate PF systems and comply to latest regulations. In recent years scenarios such complex industrial applications, Automation, varying power supply, load patterns and increasing customer expectation with regard to simplicity of the system and communication capabilities has brought the need of APFC Systems which are not just robust, but also meet the above scenarios. In the entire Power correction systems, one of the most critical and so called "brain" of the system is the APFC Controller which needs to be smart enough to take care of all such aspects. Lets see the various challenges in modern APFC systems and the possible solutions.

1. With state utilities imposing penalties on leading Power factor along with lag PF, super fine step control is the need of the hour ensuring precise control. So what it means
 - a. Just standard 8 or 12 or 16 step control is not adequate. APFC Controllers needs to have as high as 20 or 24 steps for fine reactive power control.
 - b. APFC Controllers should have the capability to switch reactors along with capacitors so as to have optimum control of reactive and capacitive loads
 - c. APFC Controllers need to switch as low as 1 or 2 Kvar banks as well , for fine PF correction
2. Operation under extreme low loads is another challenge especially



Aman Verma
Country Director - Entes India

3. With technology getting simplified in most gadgets around us, it is imperative that installation and operation of APFC panel should be also simplified and error free. This means APFC Controllers which incorporate Plug and Play and auto set up procedure which can check all connections automatically, fix the errors in case and put the panel in operation in few minutes.
4. With increased automation, power quality monitoring is need of the hour, for which customers install high end Power analysers which can monitor power quality parameters such as THD, individual harmonics in the system. Now we have advance APFC Controllers in the market which has inbuilt Power analyser so as to monitor current, voltage, Power, Energy, demand, THD and individual harmonics right upto 51st harmonic. This eliminates the need to put an additional Power analyser ensuring not just economies but also high reliability.

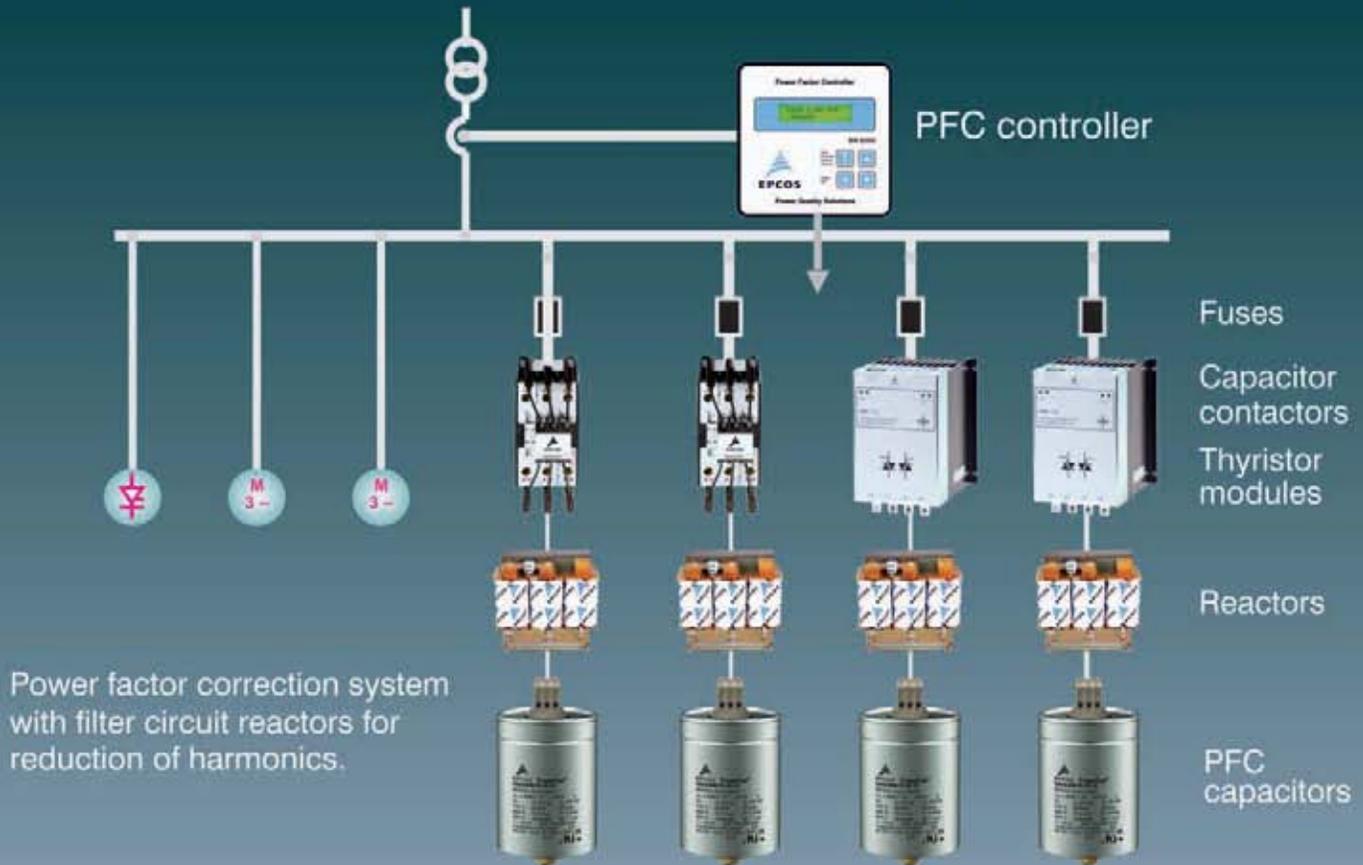
5. One of the key aspect in an APFC system is the health check of capacitor and switching devices. This means customer needs to know well in advance as to when the capacitors or contactors needs replacement, ensuring timely preventive maintenance and cutting down breakdown time. APFC Controllers now have the capability to measure real time capacitor values and operating life of contactors with adequate alarms.
6. Communication is another aspect which calls for all critical information to be available with customer as regard to APFC parameters such as power factor ratios, Energy consumption, voltage and current harmonics etc. So its not just that APFC Controllers needs to have communication capabilities, but also the platform for communication has to be simple and effective for the purpose of monitoring and control. There are cloud based PFC management softwares available where in end customer can see all critical information right on his/her screen and take necessary action in case need arises. Now remote monitoring, remote configuration and remote APFC maintenance is also possible through such innovative softwares and APFC Controllers **Entes Electronics is one of the global leader in the field of Power factor correction and energy management components / systems since 1980.** Entes started its Indian operation in 2018 and can be contacted for various APFC components and solutions. ■

Aman Verma is Country Director - Entes Energy Management Systems Pvt Ltd

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TDK India Pvt Ltd (formerly known as EPCOS)

AEML commissions India's first synthetic ester oil-filled transformer

Adani Electricity Mumbai Ltd (AEML) recently commissioned India's first synthetic ester oil-filled 220kV, 125MVA capacity power transformer in its Mumbai transmission network.

In a release, AEML said the transformer was commissioned at the 220kV Borivali EHV substation in north Mumbai. The commissioning was done in a record time of 15 days, and by taking all required safety measures in the current pandemic situation.

Fire safety: Unlike conventional mineral oil filled transformer, synthetic ester oil transformer has higher fire point (>300°C), low heat of combustion (30.8 MJ/kg). Moreover, it offers enhanced fire safety, better performance at higher temperature and prolonged life of Insulation paper, and consequently of the transformer itself.



Eco-friendly: Further, its oil has better biodegradability which is an environment friendly. Considering this, ester oil transformer is best suitable for city like installation. Along with that it has another additional feature such as resin impregnated paper (RIP) bushings, vacuum OLTC (on load tap changer), which improves reliability, significantly.

Supplied by Siemens: This synthetic ester oil-filled 220kV, 125MVA capacity power transformer was supplied by Siemens Ltd, Kalwa unit.

Reliable supply: This augmentation of transformation capacity at the Borivali EHV substation will strengthen the power transmission & distribution (T&D) infrastructure, to meet incremental load growth in and around Borivali area, maintain reliable/quality power supply and availability of transmission system at desired level.

Greener future: Speaking on the occasion AEML's spokesman said, "The Installation of Ester oil-based transformer once again underlines AEML's commitment for greener future of the city. AEML is already committed to supply 30 per cent of total electricity in its licence area through renewable resources." ■

Tata Power DDL's Smart Grid Lab gets "In-House R&D Unit" recognition

The Smart Grid lab of Tata Power Delhi Distribution Ltd has earned "In-House R&D Unit" recognition by Department of Scientific & Industrial Research (DSIR).

A release by Tata Power DDL said that it was the first recognition of its kind for any discom in the country.

The rigorous evaluation process was based on an array of R&D related parameters like new processes/products developed; collaborations and partnerships; R&D related infrastructure of labs; costs of equipment; presence at various forums; patents applied and granted, to highlight a few. The recognition will now allow Tata Power-DDL to benchmark industrial R&D, the release said.

Following this accreditation by DSIR, Tata Power DDL will be able to access grants from the Department of Science &



Technology for its R&D related activities.

Smart Grid Lab: The Smart Grid Lab, situated in Sector-15, Rohini, provides a test-bed to showcase all the information technologies and operational technologies implemented since the inception of the company, in the distribution area of Tata Power-DDL. It is primarily divided in two sections: "Technology Zone" to showcase core technologies implemented by far and "Consumer Experience Zone" to demonstrate the benefit of convenience and cost savings.

The lab demonstrates various technologies, products and solutions for power distribution utilities and how these technologies are helping in providing improved connectivity, efficiency and effectively; allowing reliability of a higher magnitude that is both sustainable and scalable to consumers.

Great distinction: Speaking on the achievement, Ganesh Srinivasan, CEO, Tata Power-DDL, said, "It is a great distinction for our Smart Grid Lab to be recognised as the 'In House R&D Unit' by Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology. This commendation reinforces our efforts towards innovation and R&D in the power distribution space to create utilities of the future. We are thankful to DSIR for honoring us." ■

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Galaxy VL: Compact 3-phase UPS



Schneider Electric has announced the global launch of the Galaxy VL 200-500kW (400V/480V) 3-phase uninterruptible power supply (UPS), the newest addition to the Galaxy family.

Available worldwide, this highly efficient, compact UPS offers up to 99-percent efficiency in ECOConversion™ mode for a full return on investment within two years (model dependent) for medium and large data centers and commercial and industrial facilities. A live, virtual “hands-on” event for data center professionals and partners will take place 13th April 2021 to demonstrate Galaxy VL’s capabilities and features from Schneider Electric’s Innovation Executive Briefing Center.

With data center floor space at a premium, the compact design of the Galaxy VL is half the size of the industry average at 0.8 sqm. Its modular and scalable architecture enables data center professionals

to scale power incrementally, from 200kW to 500kW with 50 kW power modules, providing flexibility to grow as their business demands.

With Galaxy VL, Schneider Electric introduces Live Swap, a pioneering feature which delivers a touch-safe design throughout the process of adding or replacing the power modules while the UPS is online and fully operational, offering enhanced business continuity and no unscheduled downtime. Additionally, Live Swap’s touch safe design offers increased protection for employees who no longer have to transfer the UPS to maintenance bypass or battery operation during the insertion or removal of the power modules. ■

TDK introduces new DC link capacitors with exceptionally low ESL

TDK Corporation has introduced a new series of EPCOS power capacitors for DC link applications.

The new capacitors are available for rated voltages of 700V DC to 2,000V DC and cover a capacitance range of 20 μ F to 270 μ F. The current handling capacity can be up to 60A at 65°C with the ability to tolerate current peaks of up to 7.5kA. The maximum permissible hot spot temperature is 85 °C.



The capacitors’ extremely low ESL values can be as low as 13nH, depending on the type. Thanks to this and the low ESR values of min. 0.9 m Ω , the capacitors of the B2563xE* series are suitable for inverter solutions with fast-switching power modules. (ESL = Equivalent Series Inductance; ESR = Equivalent Series Resistance.)

The low ESR value remains stable even at high switching frequencies of 100kHz, while the low parasitic coefficients prevent significant voltage overshoots even when high currents are switched off.

The capacitors’ plastic cylindrical cases conform with UL 94 V0. Two connection types are available: M8 threaded bolts or M5 threaded holes. Typical applications include fast-switching converters and inverters for photovoltaic systems, traction in railway technology and inductive heating systems.

The main fields of application include fast-switching converters and inverters for photovoltaic systems, traction and inductive heating systems. ■

New LV HRC fuse link from Siemens

Siemens Smart Infrastructure has launched the new Sentron 3NA COM LV HRC fuse link with integrated communication and measurement functionality.

The compact device is designed for low-voltage grids up to 400V and can be used in secondary substations and industrial plants. The LV HRC fuse link protects grids and plants against short circuits and overloads and is capable of measuring current.



The collected data is sent wirelessly to the new 7KN Powercenter 1000 data transceiver where it can be retrieved. In addition, it can be transferred to local or cloud-based grid and energy management systems. Among other things, the data provides insight about the current network load, phase symmetry and any irregularities. This makes it possible to increase the supply security and optimize maintenance and service. Thanks to faster fault detection and location, the duration of power outages can be significantly reduced.

The new 3NA COM LV HRC fuse link gives companies in the industry and infrastructure sector greater transparency over their power distribution. They can use the collected data for operational energy management and to optimize their energy efficiency as well as for service and maintenance.

The communication-capable fuse is easy to install and retrofit without requiring additional space. It has the same dimensions as conventional LV HRC fuses, but consists of two components that can be plugged together: an LV HRC fuse link with a shortened ceramic body and a multifunctional electronic module. ■



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Mandatory annual energy audit for power distribution companies



The Union power ministry, through a gazette notification dated April 15, 2021, has made it mandatory for power distribution companies to conduct an annual energy audit. So far, such an energy audit was required to be done once in three years.

These new regulations are called “Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit (Accounting) in Electricity Distribution Companies) Regulations, 2021”.

The new guidelines stipulate that every electricity distribution company shall have its first energy audit (accounting) conducted, by accredited energy auditor within four months from the date of coming into effect of these regulations.

FREQUENCY OF AUDIT

The guidelines further state that every electricity distribution company shall conduct energy audit (accounting) for every financial year within a period of 03 months from the expiry of relevant financial year. There shall not be a gap of more than 12 months between two energy audits (accounting) conducted by

the electricity distribution company, and report of the energy audit (accounting) shall be presented to the management of the electricity distribution company within 04 months of the end of the period for which the energy audit (accounting) relates. It is hereby clarified that if the first energy audit (accounting) is conducted during a financial year, then the energy audit (accounting) for the said financial year shall not include the time period audited in first energy audit (accounting).

PRE-REQUISITES FOR ENERGY ACCOUNTING

Electricity distribution companies shall be required to undertake all actions as may be required for the energy accounting before the first energy audit including following actions:

- Identification and mapping of all of the electrical network assets
- Identification and mapping of high tension and low tension consumers
- Development and/or implementation of information technology enabled energy accounting and audit system including associated software
- Installation and Operation of meters at

all network points including consumer premises

- Establishing a centralized energy accounting and audit cell
- Identification of overloaded segments of the network for necessary capacity additions

ENERGY AUDIT REPORT

The energy audit (accounting) structure shall be jointly decided by the accredited energy auditor and electricity distribution company. The report shall:

- provide for monitoring of input energy and consumption pattern at various voltage levels
- identify the areas of energy leakage, wastage or inefficient use
- identify high loss-making areas/networks, for initiating target based corrective action
- identify overloaded segments of the network for necessary capacity additions

The accredited energy auditor shall highlight the strengths and weaknesses of the electricity distribution company in the management of energy and energy resources in the energy audit (accounting) report and recommend necessary action to improve upon method of reporting data, energy management system in detail along with their underlying rationale.

ACTION BY BEE

The energy audit (accounting) report shall be submitted to Bureau of Energy Efficiency (BEE) within 04 months from the end of the relevant financial year. Based on energy audit report submitted, BEE can recommend necessary actions to be undertaken by the electricity distribution company for further improvement of energy accounting and reporting. ■



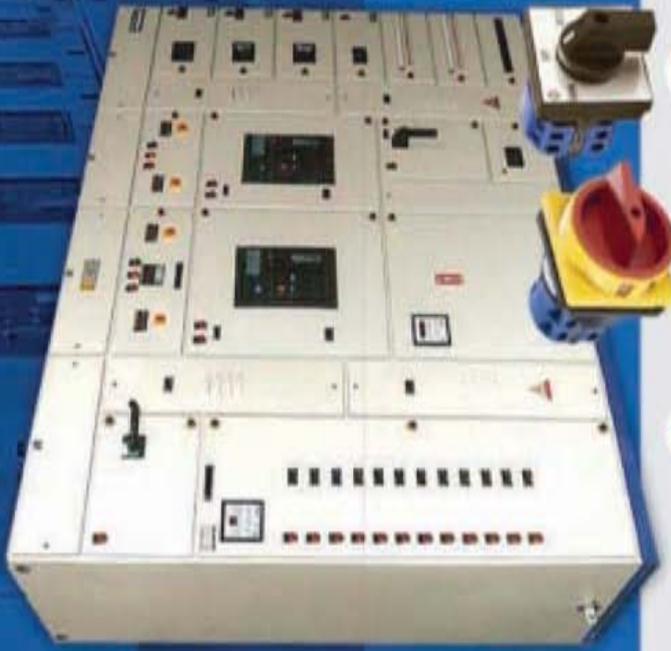
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The way this privatization process was handled is really commendable

Tata Power took over power distribution in Odisha by acquiring erstwhile state government-owned discoms—CESU, NESCO, WESCO and SOUTHCO. Tata Power will now have majority equity stake and management control in these discoms. **Sanjay Banga**, President—Transmission & Distribution, Tata Power, in conversation with Venugopal Pillai, discusses how Tata Power will meet the challenges of managing a vast consumer base of 9 million that includes a big rural component. Banga is confident that with Tata Power’s vast experience, the four newly-created discoms in Odisha, in the next three years, will be better than any state government power distribution utility.

www.tndindia.com

With so many experiments to privatize power distribution in Odisha having failed, over the past two decades, how confident were you about the joint venture PPP model that ultimately led to Tata Power taking over all four erstwhile discoms – CESU, NESCO, WESCO and SOUTHCO?

The Odisha government first decided to privatize CESU and then they went ahead with the other three discoms – WESCO, NESCO and SOUTHCO. The process took almost three years. Odisha government started this process in 2017 and this finally concluded in 2020, and on June 1, 2020, we took over operations of CESU.

Yes, earlier experiments had failed but I think, the Odisha government took good care of to imbibe the learning that they derived from the previous experience.



Quarterly safety meeting by the CEO and Chief Operation Officer with Divisional and Circle Officers & team, through video conferencing

The RfPs of the four discoms had incorporated this learning, and I feel that this made a big difference.

Could you highlight some aspects of the RfPs?

Two-three points were very interesting and that inspired us (Tata Power) to bid. One is that bidders were given a ten-year tariff trajectory; this removed the regulatory uncertainty. Secondly, the ATC loss level was specified. The Odisha government also gave bidders the liberty to check the data provided in the RfP documents. This was never the case earlier.

When we check this data through our due diligence, we found that the data was more or less correct.

The RfPs were very good, and the base data was correct. They actually incorporated steps to reduce the uncertainties. For instance, though it was specified that existing employees would need to be retained, employee provident fund issues of existing employees were resolved.

In fact, I would like to compliment Odisha Electricity Regulatory Commission (OERC) for this very successful transition. The way this privatization process was handled was very commendable.

The total number of consumers in the four Odisha discoms is around 9 million. It is a big number. What challenges are you envisaging?

We now have around ten months of experience with CESU, the first Odisha discom that we took over in June 2020. The challenges that we have in the remaining three discoms are same as what we had in CESU.

Now what are these challenges? Firstly, defective meters. In CESU, we found that a large number of energy meters were defective and the billing was provisional. On average, 30 per cent billing was provisional. When bills are provisional, consumer doesn't pay as he does believe in the bill, in the first place!

The second problem that we found in all the discoms is that there was not much resource recruitment. The result of this was that the network suffered heavily. There was no concept of preventive maintenance. Whenever there was an outage, it was attended to but there was no preventive maintenance as such. Network reliability was also very poor.

We started recruitment. Around 400 engineers have been recruited in CESU and similar numbers will be put in each of WESCO, SOUTHCO and NESCO. We are also finalizing contractors for undertaking preventive maintenance.

With Odisha, Tata Power would be encountering a large rural population. Are there any challenges that you anticipate on this count?

Yes, this is the first time that we are experiencing rural population. Delhi, where Tata Power is handling power distribution through Tata Power Delhi Distribution Ltd, is largely urban.

But what we are finding is that even in rural areas, people are willing to pay their electricity bills. That has been our first experience in Odisha. But yes, there are remote areas where there are only 15-20 households. Collecting bills from such remote locations can be challenging. We are innovating by involving self-help groups (SHGs) as we had experimented in the slum (JJ) areas of Delhi. We are also connecting with banks that have branches in such remote areas for bill collection. We are innovating and exploring different collection modes in rural areas.

What about customer support that was allegedly lacking in Odisha?

We are first ensuring reliability of power supply and customer convenience. We have opened six customer

care centres in CESU. We have opened call centre companies in WESCO, SOUTHCO and NESCO. All four utilities now have call centres. Whether a customer wants a new connection or there is a bill dispute, there is today a mechanism to address it.

Customer care is the first thing that we will try to address, reliability is another. If we ensure customer convenience and reliability, consumer will pay.

Odisha is naturally predisposed to cyclones that are known to have caused havoc in the power distribution system. Is Tata Power taking any specific preventive measures?

Over the last three months, we have prepared a detailed plan for cyclones as this is a yearly phenomenon in Odisha.

I would like to mention here that we have a big advantage of managing all the four discoms. Now, not all of these are cyclone-prone. Storm-prone areas are mainly in CESU. You also have some in the southern part. But, WESCO and NESCO are generally out of the cyclone purview. Hence, we can deploy more resources and contract labour from one discom to those that need them.

We have prepared a disaster management plan to ensure material availability in potentially affected areas. We are also taking upfront preventive maintenance like trimming trees that are very close to power lines, etc.

We recall that CESU had engaged distribution franchisees (DFs) in some areas? What is going to be their status now that Tata Power has taken over?

When we took over CESU operations, there were two DFs, namely Enzen Global and Fedco. They were controlling almost 50 per cent of CESU area. Their contract was up to June 30, 2020, and we took over on June 1, 2020. Their contracts were terminated. We appointed contractors for maintenance and completely took over operations in the franchisee areas. Now, there is no franchisee.

We expect that existing employees at the four Odisha discoms would be largely from the legacy culture. How are you handling the situation?

The existing employees are knowledgeable but they are not process-driven. I must say that they have



On-field safety training programme

coped up very well and we are now working as a team.

In fact, the four Odisha discoms are running with much less than the optimum number of employees. For example, TPCODL (former CESU) with a command area of 30,000 sqkm has around 5,000 employees. On the other hand, in Delhi, TPDDL has 500 sqkm of area but there are 3,000 employees. So, we actually need more resources in Odisha discoms.

Even the existing resources were not able to perform because material availability was not there neither was there proper training. Besides, there was delay in decision making.

We are trying to emulate the processes that we have in Mumbai and Delhi. In six months, we have implemented ERP systems and new billing systems in Odisha. We have distributed almost 1,500 desktops and laptops. The movement of files is now computerized rather than hard copy-based. These initiatives are making decision-making faster.

What are the current ATC losses in Odisha, and what is your plan of reducing them?

In case of TPCODL, we were given the then latest annual figure of 30.5 per cent for ATC losses. In June 2020 when we took over, the latest annual ATC losses were around 48 per cent, due to the COVID-19 lockdown. We closed FY21 at 29 per cent.

Regulator OERC will fix tariff at 23.7 per cent ATC loss level in FY22. We will have to bring down losses to 23.7 per cent this year (FY22) but we have set a target of 23 per cent.

This is achievable because we have improved collection efficiency to around 90 per cent. This, by itself, will reduce ATC losses. If we are able to replace

all defective meters, we can do even better. In the first year, we have replaced 2.6 lakh defective meters in TPCODL, now we are left with 2.5 lakh meters to be replaced. This will be done by March 31, 2022. By the end of this fiscal year, therefore, there will not even a single defective meter in TPCODL.

If we can give correct bills and collect monies from 95 per cent of the consumers, this itself will contribute to bringing down the losses.

What is your capex plans for the four discoms?

As a part of our RfP, we have given a capex around Rs.6,000 crore over the next five years, across all the four discoms. We will be investing around Rs.1,500 crore in TPCODL. Most of this would go towards reliability improvement, loss reduction and technology improvement. We have planned to convert all three-phase meters (HT consumers) into smart meters this fiscal year.

What is the situation with respect to household electrification under the Saubhagya scheme? Are there still households without electricity connection in Odisha?

The Saubhagya scheme has been completed in Odisha. However, we found that around 50,000 connections were not in the billing net; no bills were being generated for these consumer. This issue has now been regularized. Each consumer has a meter and bill are generated for every meter.

Speaking of meters, the only thing, as I mentioned earlier, was that in TPCODL, around 6 lakh energy meters were found defective. In WESCO, around 2.5 lakh meters were defective. Defective meters across the state will be replaced this year. In this way, we will ensure that the provisional billing that takes place today to the extent of 30-35 per cent (of consumers), will come down to less than 5 per cent.

On the policy front, what is your view on involving private sector enterprise through the asset-light distribution franchisee model?

I think that the distribution franchisee (DF) model is not the right kind of model, for privatization. The franchisee does not have ownership and there is no regulatory oversight. In the DF model, the maximum effort is on the collection front; a franchisee would not be interested in capex or technology infusion. The more the DF collects in consumer dues, the more profit the

DF makes. In the long run, due to absence of capex, network infrastructure suffers. Also employees of the existing state power distribution utility do not come under his portfolio; he brings his own employees. Customer does not get benefited, only the utility gets benefited because revenues increase. However, this benefit is more on the short-term basis.

Tata Power has successfully turned around power distribution in Delhi. How do you plan to use this rich experience to Odisha's benefit?

The experience would be very, very useful, I would say. In fact, 200 engineers from TPDDL have already moved from TPDDL to the four Odisha discoms. Our experience in collection in slum areas through social innovation in Delhi would be very helpful in Odisha.

Even our CSR activities in Delhi would be helpful. In Delhi, we first improved the general conditions in slum areas, and only then focused on revenue collection. Our experience says that once you involve yourself with society, when you think and work towards progress of society, the society pays back.

Also, the technology that we have used in TPDDL and our experience in reducing ATC losses by detecting theft of electricity is definitely going to help us in Odisha. Our teams of TPDDL that have gained experience in data analysis and in enforcement activities, especially with respect to dealing with electricity theft, will be of special importance in Odisha.

Even our experience of how existing (government)



Inauguration of TPODCL's Master Customer Care Centre at Powerhouse Square, Bhubaneswar

employees should be merged with the Tata culture is definitely going to help us in Odisha.

Are you thinking about Smart Grid architecture in Odisha, or is it too early in the day?

No, in fact, we have already started working on smart grid architecture in all four discoms. We have started GIS, SCADA and customer mapping. In next three years, all four discoms will be Smart Grid-compliant.

What is Tata Power's vision for the four Odisha discoms?

In the next three years, you will see that the four Odisha discoms will be much ahead of all other state government power distribution utilities! ■

PGCIL commissions 765kV Ajmer-Phagi transmission scheme

Power Grid Corporation of India Ltd commissioned a 765kV transmission scheme in Rajasthan, developed by its wholly-owned subsidiary Ajmer Phagi Transmission Ltd, on May 6, 2021.

The scheme, won by PGCIL under the tariff-based competitive bidding (TBCB) modality, entailed the establishment of a 765kV double-circuit line from Ajmer to Phagi, along with associated transmission infrastructure.

Objective: The transmission scheme aims to create evacuation infrastructure from upcoming wind and solar energy projects in Rajasthan. The official name of the

transmission scheme developed by Ajmer Phagi Transmission Ltd is "Transmission System associated with LTA applications from Rajasthan SEZ Part-A" and it will be developed on build, own, operation and maintain (BOOM) basis for a concession period of 35 years.

765kV line: The major component of this transmission scheme is the 268-ckm 765kV line connecting the substation of PGCIL at Ajmer to the Phagi substation of state transmission utility Rajasthan Vidyut Prasaran Nigam Ltd. According to information available, the EPC contractor for the line was Bajaj Electricals Ltd. As against

the scheduled completion date of December 2020, the line was commissioned in May 2021—the delay cause due to COVID19-related disruptions.

Major suppliers: The project costing Rs.583 crore also involved bay extensions at Ajmer and Phagi. The contractors involved were Linxon, GE T&D India, Transformers & Rectifiers (India) and BTW. While Linxon was entrusted with AIS bay extensions at Ajmer and Phagi, GE T&D India was responsible for the 765kV GIS-type bays at Phagi. T&R and BTW were commissioned for the bus reactor packages. ■

For illustration only)



BGR Energy moves Madras High Court over contract cancellation

BGR Energy Systems has moved the High Court of Madras against the cancellation of a major order earlier placed on the company by Tamil Nadu Generation & Distribution Corporation Ltd. (Tangedco).

In a stock exchange filing, Chennai-headquartered BGR Energy Systems said that Tangedco has cancelled an EPC contract worth Rs.4,442.75 crore placed on the company in December 2019.

Through a communication dated April 23, 2021, Tangedco informed BGR Energy that the letter of intent for the aforementioned contract has been cancelled for non-submission

of bank guarantees for security deposit and performance guarantee by the company. Tangedco also informed BGR Energy about the consequential forfeiture of earnest money deposit (EMD) of Rs.5 crore.

BGR Energy Systems has now moved the High Court of Madras for quashing the said cancellation of letter of intent and consequent direction to accept bank guarantees as per Government of India's instructions issued in the wake of the COVID-19 pandemic.

In December 2019, it may be recalled, Tangedco had placed a Rs.4,442.75-crore EPC contract on BGR Energy Systems for Tangedco's 1x660-mw Ennore

thermal power station expansion project.

The scope of contract includes design, engineering and supply of all equipment, civil works, erection, testing and commissioning of all systems and performance guarantee of power plant.

The completion date envisaged in the contract was 36 months from the date of issuance of the letter of intent, which works out to December 2022.

The contract also envisaged payment up to \$114.49 million in foreign currency for imported items. This contract had taken BGR Energy's outstanding order position then to around Rs.8,460 crore. ■

In BRIEF

Syska LED has won a uniquely structured tender by Convergence Energy Services Ltd (CESL) to supply LEDs for homes in rural India, based on carbon finance. As part of this agreement, CESL will be procuring 70 lakh units of 12-W LED lamps, and 30 lakh units of 7-W lamps. Both Syska and CESL will share 50 per cent of the cost and therefore 50 per cent of the revenue, arising from the sale of carbon credits and the opportunity to participate in nation building. LEDs will be distributed to homes in rural India at a minimal price of Rs. 10 each. In this tender, Syska is downside-protected through a fixed price offered by CESL; upside from carbon credits is shared in equal proportion between the two parties.

The Heavy Engineering arm of **Larsen & Toubro** has won an order for supplying 12 steam generators to Nuclear Power Corporation of India Ltd (NPCIL). This order is for the 3x700 MWe pressurized heavy water reactor (PHWR). This order strengthens L&T's position as a key nuclear power equipment supplier for Government of India's fleet-mode procurement program, L&T said. The nuclear fleet-mode programme involves construction of ten units of 700 MWe PHWRs with indigenous technology.

Larsen & Toubro has won orders to design and construct two 132/11kV substations in Dubai, UAE. The scope of these turnkey orders involves supply of advanced equipment including Gas Insulated Switchgear (GIS). The Railways Strategic Business Unit that resides within the Transportation Infrastructure business of L&T has won an order from the Central Organisation for Railway Electrification (CORE). This EPC order for "Package EPC-15A" involves 25kV overhead electrification, power supply, signaling & telecommunication, and associated works for railway lines (measuring 383.4 route km / 459 track km) in the Northeast Frontier Railway division.

KEC International Ltd reported the winning of new orders aggregating Rs.1,245 crore across its various business like power T&D, civil, railways and cables. These orders took the cumulative orders in FY21 to Rs.11,876 crore, around 5 per cent higher than in FY20. The power T&D business landed orders worth

Rs.629 crore for T&D projects in India, SAARC, Middle East, Africa, and the Americas.

GE Renewable Energy announced the supply of 42 units of GE 2.7-132 onshore wind turbines for the onshore wind hybrid projects to CleanMax totaling 110 mw. The contract also entails a 10-year full-service agreement. These turbines will be deployed across three wind farms with aggregate installed capacity of 110 mw, spread over Gujarat and Karnataka.

Olectra Greentech Ltd has won an order worth around Rs.30 crore to supply insulators to the domestic and overseas markets. The Hyderabad-headquartered company said that it has been mandated to supply composite polymer insulators (15kV to 35kV) to a "reputed" US-based company. The order is valued at around Rs.15 crore and will be completed over the next 8-10 months. In the domestic market, Olectra Greentech will supply 765kV composite polymer insulators from an Indian power transmission company. This order, too, is worth around Rs.15 crore and will have a execution period of 8-10 months.

KEC International reported the winning of orders of Rs.1,514 crore, across various businesses. In the relatively new civil infrastructure space, KEC landed orders aggregating Rs.1,035 crore for construction of an elevated viaduct along with stations for a metro rail projects. The said order value also includes contracts for mechanical and civil works for two cement plants. The power T&D business of KEC International secured orders worth Rs.326 crore for power T&D projects in India and Americas. The order is Americas was landed by KEC's subsidiary SAE Towers and is for supply of transmission towers. The cables business bagged orders of Rs.153 crore for various types of cables in India and overseas.

ORDER INFLOW & ORDER BOOK

Skipper Ltd recorded a order inflow of Rs.875 crore in FY21 as against Rs.1,241 crore in FY20. This order inflow relates to the engineering division that largely caters to the power T&D space. As of March 31, 2021, Skipper Ltd had an outstanding order book position Rs.1,412 crore. Once again, this was with respect to only the power T&D-related business. Around 40

per cent of this represented orders from Power Grid Corporation of India (PGCIL). State power utilities accounted for 22 per cent of the order book while the remaining 38 per cent constituted export orders.

Hitachi ABB Power Grids in India, listed on stock exchanges as **ABB Power Products & Systems India Ltd**, saw a 2.8 per cent growth in order inflows during Q1 (January to March) of 2021 as compared with the immediately preceding quarter. The order inflow of Rs.848.90 crore in Q1 of 2020 was largely dominated by industries and railways. The company received multiple orders for its gas-insulated high-voltage switchgear – indicative of imminent urbanization and industrialization. During Q1 of 2020, the company had reported order inflows of Rs.934.20 crore. As of March 31, 2021, the company's outstanding order book position was Rs.4,777.70 crore.

Siemens Ltd has reported a 16.9 per cent year-on-year growth in new orders during the second quarter (January 1, 2021 to March 31, 2021) of its financial year ending September 30, 2021. In a release, Siemens said that the new orders inflow from continuing operations during Q2 of FY21 stood at Rs.3,309 crore, registering a 16.9 per cent increase over the corresponding period of FY20. The company's outstanding order book position as of March 31, 2021, stood at Rs.12,677 crore.

Kalpataru Power Transmission Ltd said that it received new orders worth Rs.8,443 crore in the year ending March 31, 2021. As of March 31, 2021, the company's outstanding order book position was Rs.13,980 crore, including Rs.1,300 crore worth of orders not yet awarded but where KPTL was declared L1 bidder.

KEC International reported new order inflow of nearly Rs.12,000 crore in the year ending March 31, 2021, marking a 4.8 per cent year-on-year growth. The order inflows for FY21 (April 1, 2020 to March 31, 2021) stood at Rs.11,876 crore as against Rs.11,331 crore in FY20. As of March 31, 2021, the company's outstanding order book position was Rs.19,109 crore. Including orders where KEC was L1 but not yet booked, the order book position was well over Rs.25,000 crore. ■

A unique facility for evaluation of HTLS conductors

With increased private participation in power generation & distribution in India, alongside that of public sector, there is a robust demand for bare overhead power conductors. The challenges faced by the transmission companies are to accommodate the necessary generated power over their network. This can be accomplished by laying extra lines, which is an expensive proposition, or resources can be used for re-conductoring by HTLS (High Temperature Low Sag) conductors, which can increase the power transmission capacity.

Indian transmission companies including utilities are adopting HTLS conductors. However, at present, for independent testing, the manufacturers have to go abroad.



Side view of ERDA's HTLS Conductor Testing Lab

TYPES OF HTLS CONDUCTORS TO BE EVALUATED

- Conductor composed of a steel core and an envelope for which the high temperature effect is controlled by means of thermal resistant aluminum alloy (GAP, TAL [Thermal Alloy Conductor Steel Reinforced]; ZTAL [Ultra Thermal Resistant])
- Conductor composed of a steel core and enveloped for which the high temperature effects are controlled by means of annealed aluminum or aluminum alloy (e.g. ACSS)
- Conductors composed of non- metallic core, and an envelope for which the high temperature effect are controlled by means of thermal resistant aluminum alloy (e.g. ACCR)
- Conductor composed of a non - metallic core are controlled by and an envelope for which the high temperature effect

are controlled by means of annealed aluminum or aluminum alloys (e.g. ACCC)

- Thermal Aluminum Conductor Invar Reinforced (e.g. TACIR)

TESTS TO BE CARRIED OUT ON HTLS CONDUCTORS -

On complete conductor

- DC resistance test
- UTS test
- Stress- Strain test conductor and core at Room temperature
- Stress-strain test on conductor and core at elevated temperature
- High temperature endurance & creep test
- Conductor thermal expansion test
- Sheaves Test
- Axial Impact Test
- Radial Crush Test
- Torsional Ductility Test
- Aeolian Vibration Test
- Temperature Cycle Test

On conductor strand/core

- Bending test
- Coefficient of linear expansion
- Strand Brittle fracture test
- Torsion and Elongation tests
- Glass transition temperature test
- Flexural Strength test
- Salt Spray Test



It is, therefore, planned to set-up test laboratory for HTLS conductors at ERDA. Once this facility is created at ERDA, manufacturers and users will be able to carry out complete type and acceptance tests under one roof at ERDA as per latest international / national standards.

SPECIFICATIONS FOR EVALUATION

Facilities are being installed as per following mentioned specifications:-

- Power Grid specification II
- Draft of IEEE standard P####/D1.0, January 2009.
- CIGRE report No. 426 on guide for qualifying High temperature conductor for use on overhead transmission lines.

Sinerco Power Systems Pvt Ltd: For Power Quality Solutions



APFC Panel



Hybrid Filter



RTPFC Panel



Passive Filter

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Transmission line addition surpasses target in FY21

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India has done well in FY21, with respect to addition of new transmission lines. The quantum of new lines added in FY21 not only surpassed the target, it was an impressive 43.6 per cent more than the achievement in FY20.

According to a study by T&D India based on a report Central Electricity Authority (CEA) report, India saw the addition of 16,750 ckm of new transmission lines in FY21. These lines include only those of voltages including and exceeding 220kV.

The addition in FY21 was 6.1 per cent higher than the planned target for the year, which stood at 15,761 ckm. Compared with FY20, when 11,664 ckm of transmission lines were added, the addition in FY21 was as much as 43.6 per cent higher.

It should also be noted that the aforementioned target for FY21 was significantly lower than that for FY20, which stood at 23,261 ckm.

THE BOOST IN MARCH

Up to February 2021, it appeared very

unlikely that the target for FY21 would be attained, leave alone surpassed. However, there appeared to be a spirited effort in March 2021 when as much as 4,381 ckm of new transmission lines were added.

To put this in perspective, it means that over 26 per cent of the total addition in FY21 came in month of March 2021 alone. When seen with more granularity, statistics shows that nearly 50 per cent of the addition in March 2021 came from state power transmission utilities—an ownership class that generally displayed sluggish performance during FY21.

TRANSMISSION LINE ADDITION (CKM)			
	FY21	FY21	FY20
	Actual	Target	Actual
HVDC 800kV	3,531	3,531	0
HVDC 500kV	0	0	0
HVDC 320kV	288	0	0
765kV	1,237	2,487	3,044
400kV	5,389	3,762	3,775
220kV	6,305	6,011	4,845
Total	16,750	15,791	11,664

VOLTAGE CLASSES

Except for the 765kV category, all the others did well. In fact, February 2021 was the first month in the whole of FY21 to see any addition at all of 765kV. (See detailed story). March 2021, the last month of FY21, also saw the addition of 765kV lines.

FY21 was significant in that it saw the commissioning of a healthy volume of HVDC lines—3531 ckm of 800kV lines, thanks largely to the Raigarh-Pugalur HVDC scheme.

The bulk of the addition in FY21 came from 220kV lines (6,305 ckm), followed by 400kV lines (5,389 ckm).

OWNERSHIP

In terms of ownership, nearly 46 per cent of the transmission line addition in FY21 was attributable to the state government sector. The Central government sector (mainly Power Grid Corporation of India Ltd) had a share of 43 per cent. The remaining 11 per cent was contributed by the private sector. ■

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Ola announces world's largest electric two-wheeler charging network



OLA ELECTRIC has revealed its plans for providing charging solutions to all its electric two-wheeler customers and unveiled the “Ola Hypercharger Network” — the charging network for its upcoming two-wheeler products starting with the Ola Scooter to be launched in the coming months.

Ola will offer the most comprehensive set of charging options to its electric vehicle customers through a combination of widely deployed

high-speed Ola Hyperchargers and the home-charger that will come bundled with the Ola Scooter.

The Ola Hypercharger Network will be the widest and densest electric two-wheeler charging network in the world, with more than 100,000 charging points across 400 cities. In the first year alone, Ola is setting up over 5,000 charging points across 100 cities in India, more than double the existing charging infrastructure in the country. ■

World's first power transmission solutions with holistic cloud connectivity

Siemens Energy has launched the world's first power transmission solution with holistic cloud connectivity and designated web application suite at Hannover Messe, Germany.

SENSOLUTION

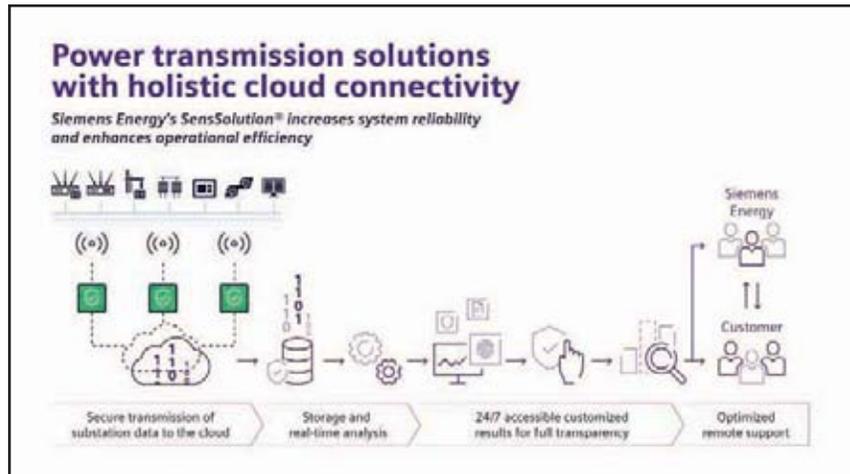
SensSolution enables the secure transmission of substation data to the cloud, allowing for valuable real-time analyses and monitoring, supporting system operation and availability as result. Siemens Energy will deploy SensSolution to its complete transmission solutions portfolio, starting now with high-voltage direct current (HVDC) systems.

ADVANTAGE OF DIGITALIZATION

Today's transmission grid operators face an abundance of challenges including the increasing share of renewables in the grid and their hard-to-predict feed-ins. Digitalization offers many opportunities to meet these challenges through the intelligent use of data available in substations, a release from Siemens Energy said.

IMPROVED OPERATIONAL EFFICIENCY

"SensSolution is the next logical step in our journey to fully unlock the potential of digitalization in energy transmission. By combining our vast experience gained in both fields, turnkey transmission solutions and connective transmission Sensproducts, we are now able to offer our customers SensSolution as a new digital layer



for a maximum of transparency and improved operational efficiency of transmission solutions," says Beatrix Natter, Executive Vice President Transmission at Siemens Energy.

HOW IT WORKS

SensSolution processes all available data from substations to a cloud-based platform where the operators can access different applications and dashboards to gain insights on a system's actual status. This enables operators to plan ahead and make the right decisions to ensure optimized operation, handle imminent failures, schedule maintenance work or plan long-term investments. The operators can directly access the customized results via the internet on the SensSolution portal, location independent, and receive alarms in case of critical events.

CYBERSECURITY

Cybersecurity is a critical factor in the success of digitalization.

Therefore end-to-end encryption is used when transmitting the operational data via a highly secure gateway from a site to the cloud. One-way connectivity makes sure that data can only flow in one direction and never exposes the HVDC control system to the outside. Due to guaranteed, complete physical isolation, intrusion into the substation from the internet is simply not possible.

HVDC TO START WITH

As first part of deployment of the new technology, Siemens Energy will equip from now on all new HVDC systems with SensSolution. Providing the most efficient means of transmitting large amount of power over long distances, HVDC power transmission is a key enabler for integrating renewable energy, e.g., from offshore and onshore wind farms. As core technology for interconnecting grids, HVDC technology also enables the exchange of electricity within and between different countries. ■

Siemens Energy to supply grid stabilizer technology to Ireland



Photograph shows a synchronous condenser that Siemens Energy will supply to ESB, Ireland.

The condenser will be Ireland's first and will incorporate the world's largest flywheel used for grid stability. It will be a key component of ESB's "Green Atlantic @ Moneypoint" project..

Siemens Energy will be supplying a synchronous condenser system to Ireland, to ensure grid stability even when injection of renewable energy exceeds limit.

The supply will be made to Electricity Supply Board (ESB), Ireland's leading energy company. The grid stabilizing system will be developed at the Moneypoint power station located in South-West Ireland near Kilrush, County Clare. Commissioning of the new plant is planned for mid-2022.

ESB recently announced the launch of "Green Atlantic @ Moneypoint", an ambitious plan to transform the County Clare site into a green energy hub, where a range of renewable technologies will be deployed over the next

decade with the capacity to power 1.6 million homes.

The synchronous condenser, a key component of the "Green Atlantic @ Moneypoint" project, will be the first in the country and will incorporate the world's largest flywheel used for grid stability.

The facility will enable an increased integration of wind power into the Irish grid by providing sufficient inertia for frequency support, short-circuit power for system strength and reactive power for voltage control.

SIEMENS ENERGY'S SCOPE

Siemens Energy will deliver the synchronous condenser system, providing engineering, procurement, and construction. Key components are a control system which optimally fits to the overlaying grid automation system, a synchronous generator with circuit-breaker and a flywheel. In addition, Siemens Energy will provide the preventive maintenance for ten years with remote diagnostics. The synchronous condenser will, in turn, help management of Ireland's transmission system with a reduced dispatch of fossil fuel plant under constraints and reduced costs of transmission operations. ■

IN BRIEF

German transmission system operator Amprion has commissioned **Siemens Energy** with the construction of two SVC PLUS series static synchronous compensator (STATCOM) systems to further stabilize the German transmission power grid. The STATCOMs will feature innovative grid-supporting control mechanisms allowing the systems to efficiently compensate for increasing voltage fluctuations in the electrical transmission network.

GE Grid Solutions and **Hitachi ABB Power Grids Ltd** have announced a non-exclusive, cross-licensing agreement related to the use of an alternative gas to SF6 used in high-voltage equipment. This alternative, a fluoronitrile-based gas mixture, has a significantly reduced impact on the environment compared to SF6. Under this landmark agreement between two global leaders in power technologies – both companies will share complementary intellectual property related to their respective SF6-free solutions.

Eaton has signed an agreement to acquire 50 per cent stake in Jiangsu YiNeng Electric's busway business, which manufactures and markets busway products in China. This acquisition will add busway to Eaton's power distribution portfolio in the Asia Pacific region. Jiangsu YiNeng Electric is a leading Chinese electrical equipment manufacturer. Founded in 2002 and headquartered in Jiangsu, China, the company serves the data centre, infrastructure, commercial building, telecommunications, and industrial segments. ■

Sumitomo Electric to supply 132kV cables for UK offshore wind farm

Sumitomo Electric Industries Ltd, in a release, said that it has been awarded a contract by UK Offshore Transmission Owner, Gwynt y Môr OFTO Plc. (GYM), to supply 132kV offshore export cable to transmit power from an 576-mw offshore wind farm in UK.

The Gwynt y Môr wind farm is located approximately 15km off the North Coast of Wales. The wind farm comprises 160 wind turbine generators and associated transmission assets. There are two offshore substation platforms. The substations are connected onshore by four c.20km subsea export cables. The onshore cables, each 11km long, connect to the onshore substation at Bodelwyddan, near St. Asaph.



The export cable is considered to be a critical infrastructure to deliver renewable energy to UK consumers. Sumitomo Electric's state-of-the-art submarine cable technology, backed by significant track records since the early 1900s, was

selected by GYM to increase the reliability of its power transmission asset and maximize the availability of the wind farm.

The Gwynt y Môr offshore wind farm that is equipped with 160 Siemens-Gamesa turbines of 3.6-mw rating. The wind farm has been in operation since 2015. It is learnt through media reports that the export cable order on Sumitomo Electric was placed after the original cable (supplier unknown) developed technical snags. ■

Cabinet approves PLI scheme for advanced battery storage

The Cabinet, chaired by Prime Minister Narendra Modi, recently approved the proposal for implementation of the Production Linked Incentive (PLI) scheme for advanced battery storage.

Proposed by Department of Heavy Industries (DHI), the “National Programme on Advanced Chemistry Cell (ACC) Battery Storage”, with an outlay of Rs.18,100 crore, aims achieving manufacturing capacity of 50 GWh of ACC and 5 GWh of “Niche” ACC.

ACCs are the new generation of advanced storage technologies that can store electric energy either as electrochemical or as chemical energy and convert it back to electric energy as and when required.

APPLICATION AREAS

The consumer electronics, electric vehicles, advanced electricity grids, solar rooftop etc. which are major battery consuming sectors are expected to achieve robust growth in the coming years. It is expected that the dominant battery technologies will control some of the world’s largest growth sectors, a government release said.

CURRENT SITUATION

While several companies have already started investing in battery packs, though the capacities of these facilities are too small when compared to global averages, there still is negligible investment in manufacturing, along with value addition, of ACCs in India.

All the demand of the ACCs is currently being met through imports in India. The National Programme on Advanced Chemistry Cell (ACC) Battery Storage will reduce import dependence. It will also support the Atmanirbhar Bharat initiative.

HOW IT WORKS

ACC battery storage manufacturers will be



selected through a transparent competitive bidding process. The manufacturing facility would have to be commissioned within a period of two years. The incentive will be disbursed thereafter over a period of five years.

The incentive amount will increase with increased specific energy density and cycles and increased local value addition. Each selected ACC battery storage manufacturer would have to commit to set-up an ACC manufacturing facility of minimum 5 GWh capacity and ensure a minimum 60 per cent domestic value addition at the Project level within five years.

Furthermore, the beneficiary firms have to achieve a domestic value addition of at least 25 per cent and incur the mandatory investment Rs.225 crore/GWh within two years (at the mother unit level) and raise it to 60 per cent domestic value addition within five years, either at the mother unit, in case of an integrated unit, or at the project level, in case of “hub & spoke” structure.

EXPECTED OUTCOMES

- Setup a cumulative 50 GWh of ACC manufacturing facilities in India under the programme

- Direct investment of around Rs.45,000 crore in ACC battery storage manufacturing projects
- Facilitate demand creation for battery storage in India
- Facilitate Make-in-India: Greater emphasis upon domestic value-capture and therefore reduction in import dependence
- Net savings of Rs.2,00,000 crore to Rs.2,50,000 crore on account of oil import bill reduction during the period of this programme due to EV adoption as ACCs manufactured under the programme is expected to accelerate EV adoption
- The manufacturing of ACCs will facilitate demand for EVs, which are proven to be significantly less polluting. As India pursues an ambitious renewable energy agenda, the ACC program will be a key contributing factor to reduce India’s Green House Gas (GHG) emissions which will be in line with India’s commitment to combat climate change
- Import substitution of around Rs.20,000 crore every year
- Impetus to R&D to achieve higher specific energy density and cycles in ACC
- Promote newer and niche cell technologies. ■

Transformation capacity addition falls 16 pc in FY21



India's addition of transformation capacity, through substations of 220kV or more, was 16 per cent lower year-on-year in FY21.

According to latest statistics released very recently by Central Electricity Authority (CEA), India added 57,575 MVA of transformation capacity in FY21. This is measured through substations of rating 220kV or more. Compared with the 68,230 MVA added in FY20, the achievement in FY21 was 16 per cent lower.

Further, in both years, the addition fell short of the planned target. In FY20, the target achievement was 83.4 per cent, improving somewhat to 91.3 per cent in FY21.

1-MILLION MVA MARK

An achievement of sorts was made in FY21 with India's total transformation capacity cross the 1-million MVA mark. As of March 31, 2021, India's aggregate transformation

SUBSTATION CAPACITY		
(As of March 31, 2021)		
Ownership	MVA	% share
Central	400,661	39.1
State	582,000	56.8
Private	42,807	4.2
Total	1,025,468	100.0

SUBSTATION CAPACITY		
(As of March 31, 2021)		
Category	MVA	% share
HVDC 800kV	15,000	1.5
HVDC 500kV	13,500	1.3
HVDC 320kV	1,000	0.1
765kV	238,700	23.3
400kV	362,327	35.3
220kV	394,941	38.5
Total	1,025,468	100.0

capacity reached 10,25,468 MVA, up 6 per cent from 967,893 MVA as of the same date in 2020.

HVDC SUBSTATIONS

Of the total 57,575 MVA added in FY21, a total of 4,000 MVA, or nearly 7 per cent, came from HVDC substations. Much of this capacity was associated with the 800kV Raigarh-Pugalur HVDC link, major portions of which were commissioned in FY21.

As of March 31, 2021, HVDC substations had a share of 2.9 per cent in India's total transformation capacity. As of March 31, 2020, this share was slightly lower at 2.6 per cent. This HVDC capacity includes all voltage classes—800kV, 500kV and 320kV.

It is also interesting to observe that FY21 saw the emergence of a new HVDC voltage class—320kV. This came about by the VSC-based HVDC station associated with the Pugalur-Trichur extension of the 800kV Raigarh-Pugalur HVDC line.

THE 765KV CLASS

India fared poorly with respect to addition of 765kV transmission lines. With the result, 765kV-based transformation capacity also suffered. The country could add barely 7.700 MVA of transformation capacity based on 765kV substations. All of this was accomplished by Power Grid Corporation of India (PGCIL). It may be recalled that no interregional transmission lines, based on the tariff-based bidding mechanism (TBCB), were awarded in FY21. This would have been an important avenue for 765kV lines and substations.

State government utilities had planned to add 6,000 MVA of capacity through 765kV substations in FY21. However, the year ended with nil achievement.

OVER 40 PC SHARE

Nearly 43 per cent of the total substation capacity added in FY21 was from 400kV substations. As of March 31, 2021, this voltage class had a share of 35.3 per cent in India's total transformation capacity. This share has by and large remained steady over the past decade.

State government transmission utilities accounted for 56 per cent of the aggregate 57,575 MVA added in FY21. Much of this was through 220kV substations. Central utilities, mainly PGCIL, had a corresponding share of 37 per cent, much of this coming from 400kV and HVDC substations. The private sector couldn't do better than accounting for just 7 per cent of the total transformation capacity added in FY21. ■

Gautam Solar raises panel mfg capacity to 250 mw

Gautam Solar has more than doubled its annual solar panel manufacturing capacity from 120 mw to 250 mw, at its Haridwar plant in Uttarakhand.

This, according to a statement by Gautam Solar, has made the company the third largest solar manufacturer in north India.

In a brief interaction with T&D India, Gautam Mohanka, Managing Director, Gautam Solar, noted that the capacity expansion was carried out to accommodate the rising demand for solar energy in India. Mohanka explained that Gautam Solar has four manufacturing facilities—all located at Haridwar in Uttarakhand. These four facilities



are respectively dedicated to solar panels, batteries, electronics and structures. "If things go according to plan, we will soon increase the production capacities at our other facilities as well," Mohanka added.

A release from Gautam Solar noted that it was imperative to raise local production and reduce imports from countries like China.

Once the solar demand is met, India can venture into the global solar market – which would give a liquidity boost to the country, the release added.

PLI scheme in India is also working on the same objective as it is expected to add 10,000 mw of integrated solar PV manufacturing capacity and bring direct investments of about Rs.17,200 crore. Market experts are predicting that close to 30,000 jobs will also be created in the process.

Prior to announcing the new PLI scheme, the Indian government had already imposed 40 per cent basic customs duty on solar modules and 25 per cent on solar cells, effective April 1, 2022. ■

TP Saurya wins full 250 mw capacity in Mahagenco solar auction

TP Saurya Ltd, a wholly-owned subsidiary of Tata Power, has won the entire 250 mw of solar capacity put to auction by state utility Maharashtra State Power Generation Company Ltd (Mahagenco).

The 250-mw of grid-connected solar power capacity is to come up at the Dondaicha Solar Park in Maharashtra.

TP Saurya won the auction quoting a tariff of Rs.2.51 per kwh. It is reliably learnt that NTPC Renewable Energy and SJVN Ltd also participated in the tender submitting bids of Rs.2.82 per kwh and Rs.2.53 per kwh, respectively.

In January this year, Mahagenco had invited bids from solar power developers to set up 250 mw of grid-tied solar power capacity at the Dondaicha Solar Park located in Dhule district of Maharashtra. Bids closed for submission on February 15, 2021.

The tender had mandated a ceiling tariff of Rs.2.83 per kwh, valid for a power purchase tenure of 25 years.

The 250-mw solar power project is expected to cost Rs.875 crore and is stipulated to be commissioned within 15 months from the date of signing of PPA. Besides, the project must attain financial closure within nine months from the PPA signing date.

The 250-mw project will be divided into three parts -- Block I (75 mw), Block-II (125 mw), and Block III (50 mw). ■

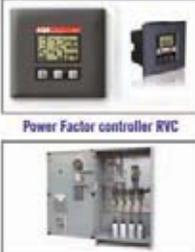


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Desulphurization of coal-fired power plants lagging behind schedule

The activity of desulphurization of coal-fired power plants, as mandated by the environment ministry, is lagging behind schedule, it was recently informed in Parliament.

Up to end-December 2020, only 68 coal-fired power units had implemented SO₂ emission control measures, it was informed. Out of these, 48 units had CFBC (circulating fluidized-bed combustion) boilers, 16 units had wet flue-gas desulphurization (FGD) while the remaining four units had dry FGD.

It may be mentioned that for control of SO₂ emission, thermal power plants can opt for any approach based on the concentration of SO₂ emission in flue gas. Some options include addition of limestone during combustion in CFBC boilers, installation of flue-gas desulphurization (dry or wet) units, etc.

As of end-December 2020, there were as many as 442 units aggregating 167,562 mw (or roughly 168 GW) that were under various stages of implementation of FGD units.

It was also informed in Parliament that some of the reasons why FGD installations are facing delay are:

- Limited availability of vendors
- Price escalation due to limited supply of components



- Impact of COVID-19 on supply chain
- Restriction on import from prior reference countries

The 2022 deadline: According to Central Pollution Control Board (CPCB) guidelines, coal-based power plants are to ensure compliance of the environmental standards, including for SO₂ emissions, notified by Ministry of Environment, Forest & Climate Change (MoEF&CC), by its notification dated December 7, 2015.

In view the techno-economic feasibility and in order to ensure uninterrupted power supply position in the country, a phased implementation plan for installation of FGD by thermal power plants was submitted to MoEF&CC on October 13, 2017. The deadline for this programme was end-2022.

Accordingly, CPCB has issued directions under Section 5 of Environment (Protection) Act, 1986, to thermal power plants to comply with emission norms in a phased manner. ■

Nava Bharat Ventures revives Odisha power plant, registers on IEX

Hyderabad-based Nava Bharat Ventures has begun merchant electricity sales from its newly-revived power plant in Odisha.

In a stock exchange communication, Nava Bharat Ventures said that it has synchronized to grid its 60-mw power plant and has commenced power flows for merchant trade. The communication further says that the company has also completed registration of the 60-mw power plant with Indian Energy Exchange (IEX).

It may be mentioned that the 60-mw power plant had remained idle for several years. The breakthrough came about in April this year when Nava Bharat Ventures informed stock exchanges that the company, in engagement with the local power utility in Odisha, was able to resolve the long-



pending metering and connectivity issue related to the 60-mw power plant. This, in turn, came about after the legal case before the High Court reached final settlement.

The 60-mw power plant (one unit of 60 mw) represents the "IPP" portion of the power plant with 150 mw installed capacity, located at Kharagprasad in Odisha. The

remaining 90 mw (one unit of 60 mw and one of 30 mw) is used for captive consumption in the company's ferro alloy business.

Telangana plant: Even the 150-mw Telangana power plant, owned by Nava Bharat Energy India Ltd, a wholly-owned subsidiary of Nava Bharat Ventures, resumed power generation in April 2021. The plant, located at Paloncha, remained shut down in FY21. The resumption comes in the wake of improved merchant power market. The plant is now selling electricity on energy exchanges.

Zambia: Nava Bharat Ventures operates a 300-mw coal-based power plant, with mining facilities, in Zambia. This is understood to be the only integrated coal-based power plant in Zambia, an East African country that relies heavily on hydropower. ■

Vestas retains global wind market leadership in 2020



For the fifth year in succession, Vestas retained its leadership as the world's largest supplier of onshore and offshore wind turbines in 2020, according to a report by Global Wind Energy Council (GWEC).

Vestas could maintain its leadership due to its wide geographic diversification strategy, with new installations in 32 markets in 2020. The Danish manufacturer posted a strong performance in US, Australia, Brazil, Netherlands, France, Poland, Russia and Norway, the report said.

GE RENEWABLE ENERGY AT #2

GE Renewable Energy moved up two positions from 2019, to the second place in 2020, mainly due to the explosive growth in its home market of the US and its strong position in Spain in 2020. Despite disruption cause by COVID-19 to local supply chains and project execution in the US, the American manufacturer reported more than 10 GW of installations at home last year, making it the number

one supplier in the US the second year in a row.

CHINESE COMPANIES AT #3 AND #4

Chinese supplier Goldwind retained the third position in 2020, although it achieved a record year in its home market with more than 12 GW installations and its new installations in overseas markets passed the 1 GW milestone for the first time. Goldwind still held the top spot in China last year, but the supplier lost market share at home due to strong competition from tier-2 local suppliers.

WIND TURBINE OEM RANKINGS			
Supplier	2020		2019
	MW	Rank	Rank
Vestas	16,186	1	1
GE Renewable Energy	14,135	2	4
Goldwind	13,606	3	3
Envision	10,717	4	5
Siemens Gamesa	8,678	5	2
Source: GWEC			

Chinese Envision ranks fourth in 2020, moving up from the fifth position in 2019, by taking advantage of strong market growth in its home market, where more than 10 GW was installed by the company in a single year, a record for the company.

SIEMENS GAMESA FALLS TO #5

Although Siemens Gamesa had installations in 31 markets in 2020, the manufacturer fell three positions from 2019, to fifth place. The company reported 8.7 GW of new installations in 2020, 1.2 GW lower than the previous year, primarily due to a relatively slow year of offshore wind in Europe. Nevertheless, Siemens Gamesa retains its title as the world's largest offshore wind turbine supplier in 2020.

US AND CHINA LEAD IN 2020

"Our preliminary findings from the supply side confirm that 2020 was an incredible year for the wind industry. Chinese and American turbine manufacturers had a record of new installations that saw most of them moving up in global turbine OEM market rankings," said Feng Zhao, Head of Strategy and Market Intelligence at GWEC. "This makes sense as it reflects the situation that the world's two largest markets China and United States had the lion's share in global wind installation in 2020."

DETAILED REPORT IN APRIL 2021

These rankings will be published in the "Global Wind Market Development — Supply Side Data 2020", which will be released in late April 2021. Preliminary results are subject to change between now and the release date of the actual report. The report is part of GWEC's Market Intelligence series that provide insights and data-based analysis on the development of the global wind industry. ■



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Power Generation Sector: Highlights of FY21

Central Electricity Authority recently released statistics of the power sector, relating to March 2021 and therefore for FY21. Here are some highlights relating to the power generation segment.

- India could add 5,436 mw of new generation capacity from conventional sources (thermal and hydro) in FY21, as against 7065 mw in FY20. Central PSU NTPC was responsible for most of the capacity addition in FY21. There was no new nuclear power generation capacity added in FY21, as was the case with FY20.
- Electricity generation, through conventional sources (including large hydropower), was 1,251 billion kwh (BU) in FY21, down 1.3 per cent from 1,234 BU in FY20.
- Import of electricity from Bhutan (included in the 1251 BU figure above) grew 52 per cent from 5.794 BU in FY20 to 8.791 BU in FY21. (Related story).
- Power generation from nuclear power plants recorded a rather sharp year-on-year decline of 7.6 per cent to touch 42.949 BU in FY21.

- Electricity generation from renewable energy sources (excluding large hydropower) is estimated to have risen by 5 per cent to reach 155 BU in FY21 from 147 BU in FY20.
- The share of renewable energy (excluding large hydropower) in India's total electricity generation in FY21 is estimated to be 11 per cent, unchanged from FY20.
- Based on data for the first eleven months (April to February), wind power generation fell by 7.5 per cent in FY21 while solar power generation rose significantly by nearly 21 per cent.
- Wind and solar together accounted for over 80 per cent of the total electricity generated from renewable energy

sources in FY21 (April to February).

- India's total power generation capacity stood at 3,82,151 mw, as of March 31, 2021, according to provisional estimates.
- Renewable energy sources (excluding large hydropower) had a share of around 25 per cent in India's total power generation capacity, as of March 31, 2021. [This is a provisional estimate.]
- A little over half of India's total installed power generation capacity, as of March 31, 2021, came from coal-fired power plants.
- The private sector represented the largest ownership group of India's overall installed power generation capacity (including conventional and renewables). As of March 31, 2021, the private sector had a share of 47 per cent. This dominance comes from renewable energy capacity where the private sector has almost solo ownership. ■

ELECTRICITY GENERATION* (BILLION KWH)			
	FY21	FY20	% chg
Thermal	1,032.395	1,042.748	-1.0
Nuclear	42.949	46.472	-7.6
Hydro	150.305	155.769	-3.5
Bhutan imports	8.791	5.794	51.7
Total	1,234.440	1,250.784	-1.3
*Excluding renewables			

(Note: FY21 runs from April 1, 2020 to March 31, 2021; FY20 is from April 1, 2019 to March 31, 2020)

The **Draft National Electricity Policy 2021** is in the making; the power ministry has constituted an expert panel to this effect, it is learnt through reliable media reports. This expert panel will be headed by Girish Pradan, former Chairman, Central Electricity Regulatory Commission (CERC), while Joint Secretary, Union power ministry, will be the convenor. A prominent member of this panel is Rakesh Nath, former Chairman, Central Electricity Authority (CEA) and ex-member, Appellate Tribunal for Electricity (APTEL).

Larsen & Toubro said that it has begun construction of a large solar power plant in Saudi Arabia for which it had recently clinched the EPC mandate. The 300-mw Jeddah solar photovoltaic power plant was contracted upon the renewable arm of Larsen & Toubro's power transmission & distribution business, by a consortium of Masdar, EDF Renewables and Nesma Company. Construction has begun following a "go ahead" given by the developer consortium, L&T said. The project is in Third Jeddah Industrial City, 50km south-east of Jeddah. This large utility scale power plant utilizes modern technologies including bifacial modules, single axial trackers, string inverters and robots for module cleaning.

NHPC has informed that a promoters' agreement has been signed on April 13, 2021, between NHPC Ltd, Jammu & Kashmir State Power Development Corporation Ltd (JKSPDCL) and Government of Union Territory of Jammu & Kashmir, for implementing the 850-mw Ratle hydropower project in Jammu & Kashmir. Accordingly, a new joint venture called "Ratle Hydroelectric Power Corporation Ltd" will be formed with two partners -- NHPC (equity stake: 51 per cent) and JKSPDCL (equity stake: 49 per cent). The share of NHPC in the joint venture company shall not be brought below 51 per cent and the share of JKSPDCL shall not be brought below 49 per cent, the agreement stipulates.

Sterlite Power and Vinci Energia (VIGT11), through Vinci Infraestrutura Gestora de Recursos LTDA, announced the formalization of the commitment of first acquisition of issuance of debentures convertible into shares for the Vineyards Project in Brazil. The transaction foresees R\$149 million (149 million Brazilian Real) in debentures aimed at developing projects in Sterlite Power's portfolio. The investment amount can be converted into shares with an 80 per cent purchase option when the Vineyards project is complete in this year. The

remaining 20 per cent can be purchased within 190 days.

EDF India announced it has completed the installation of 1 lakh smart meters in India under a contract with Energy Efficiency Services Ltd (EESL). The company marked this as the completion of the first stage of the contract and the beginning of the commercial roll-out of 5 million smart meters installation across India, nearly half of which will be installed in Bihar. The contract was awarded to EDF in association with India-based Accenture Solutions Pvt Ltd in 2019. It covers the design of advanced metering infrastructure (AMI), installation of 5 million smart meters across India, integration of the smart meters with the existing billing system of electricity distribution companies as well as operation and maintenance of the whole system for a period of six-and-a-half years.

Coal India Ltd has incorporated two new wholly-owned subsidiaries that will mark the company's diversification in the renewable energy business. The first subsidiary "CIL Solar PV Ltd" will be engaged in the solar manufacturing value chain – from ingot to wafer to cell to module. The second subsidiary "CIL Navakarniya Urja Ltd" will look at the renewable energy business. Though CIL did not specify the exact scope of activity, it is learnt that this company will be CIL's developer arm for renewable energy projects.

Adani Renewable Energy Holding Fifteen Ltd, a wholly-owned subsidiary of **Adani Green Energy Ltd**, has been awarded a 150-mw solar power project by Torrent Power to be set up in Gujarat. The fixed tariff for this project is Rs.2.22 per kwh, for a period of 25 years. The project is expected to commission by the third quarter of FY23.

Schneider Electric Infrastructure Ltd has appointed Sanjay Sudhakaran as Additional Director, Managing Director & Chief Executive Officer. The appointment will be for a consecutive period of five years, effective May 1, 2021, subject to the approval of shareholders of the company. The board of Schneider Electric Infrastructure Ltd also appointed Amol Phatak as an Additional Director of the company, May 1, 2021.

Schneider Electric has launched the "Zero Carbon Project" under which it will partner with its top 1,000 suppliers to halve their operations' CO2 emissions by 2025. Under the program, Schneider

will provide tools and resources to program participants to help them set and achieve their own carbon reduction targets. Suppliers will be first encouraged to quantify their CO2 emissions using the company's digital tools. Suppliers will then use that data to set goals and strategies for emissions reduction. Suppliers will also work towards their goals through decarbonization initiatives such as energy efficiency or renewables.

NTPC announced that 15 mw out of the total 85 mw installed capacity of its Bihour solar PV project in Uttar Pradesh turned operational on April 8, 2021. With this, the installed capacity of NTPC has grown to 52,400 mw and that of NTPC Group (including subsidiaries and joint ventures) has reached 65,825 mw.

Central Electricity Authority (CEA) and CEEW's Centre for Energy Finance (CEEW-CEF) have launched "**India Renewables Dashboard**" that aims to provide detailed operational information on renewable energy projects in India. This dashboard (<https://renewablesindia.in>) is freely accessible to policymakers, developers, financiers, and the public. The dashboard, supported by the Shakti Sustainable Energy Foundation, captures daily generation data at the state, regional and national levels for the aggregate 93 GW of installed RE capacity in India. It also captures this data at a plant level for a subset of projects.

Torrent Power has been awarded a 25-year PPA for 300 mw of solar power generation, at Rs.2.22 per kwh. The solar plant, with an investment of around Rs.1,250 crore, will come up in Gujarat. The power will be supplied to a Gujarat-based power distribution licensee of Torrent Power Group. Torrent Power's aggregate renewable capacity is currently around 1,300 mw that includes 515 mw under development.

Coal India Ltd has signed its very first solar-related PPA. It did so with Gujarat Urja Vikas Nigam Ltd (GUVNL) for supplying 100 mw of solar power, for a period of 25 years. Power supplies will need to begin within 18 months. CIL is in the process of appointing an EPC contractor for the Gujarat-based solar power plant that is estimated to cost Rs.442 crore.

Jindal Steel & Power Ltd (JSPL) has accepted a binding offer from Worldone Pvt Ltd to divest its 96.42 per cent stake in its subsidiary Jindal

Power Ltd. The equity value is an all-cash offer of Rs.3,015 crore for 96.42% stake in JPL, including coal-fired power plants with aggregate capacity of 3,400 mw in Chhattisgarh, and other non-core assets owned by JPL. JSPL will focus on its steel business in India, especially the upcoming expansion at its Angul plant in Odisha from 6 million tpa to 12 million tpa.

BCPL Railway Infrastructure Ltd, in a stock exchange filing, has said that it has successfully electrified railway tracks of about 289.50 track km (tkm) in FY21, across various zones of the Indian Railways (IR). The company added that this has contributed to running of trains with electric traction which in turn would reduce pollution as well as the country's dependence on imported fossil fuels.

Vikram Solar has appointed Dr. Milind Kulkarni as its Chief Technical Officer (CTO). Dr. Kulkarni's role will be critical in product & technology development and manufacturing, design & process development, while supporting the company's expansion and achieving technological breakthrough, a release from Vikram Solar said.

Central Electricity Authority has permitted uprating of the Karcham Wangtoo hydropower plant in Himachal Pradesh, owned by JSW Hydro Energy Ltd, a wholly-owned subsidiary of **JSW Energy Ltd**, from 1,000 mw to 1,091 mw in a phased manner. This 9-per cent uprating has been done without any additional capital expenditure.

Tata Power Delhi Distribution Ltd (Tata Power-DDL) has estimated a peak electricity demand of about 2,150 mw this summer season and made an arrangement of up to 2,400 mw, the power utility catering to north Delhi said in a release. Tata Power-DDL is fully prepared to meet any increase in electricity demand by the essential service providers amidst the raging pandemic. The company also believes that the work-from-home guidelines during the ongoing pandemic will further increase the domestic AC load leading to a spurt in demand.

Vijay Goel assumed the additional charge of Chairman and Managing Director of **THDC India Ltd**, effective May 1, 2021. Goel, who is also discharging the responsibility of Director (Personnel) of THDCIL, joined THDC in 1990 as Sr. Personnel Officer (SPO) from NHPC Ltd. He has more than 35 years of varied experience in the field of Human

Resource Management, a release by THDC India said.

THDC India Ltd announced the appointment of Vijay Goel as the company's Chairman and Managing Director. The release noted that Goel has been entrusted with this additional charge, effective May 1, 2021. Goel is already discharging the responsibility of Director (Personnel), THDC India Ltd. Vijay Goel joined THDC India Ltd in 1990 as Senior Personnel Officer from NHPC Ltd. He has more than 35 years of varied experience in the field of human resource management, the release noted.

Goldi Solar has completed a 24+ MW supply order of solar modules to LS Mills, a textile company based in Tamil Nadu. The modules are for a project based in Aviyoor, Virudhunagar District of Tamil Nadu commissioned in March 2021. Goldi Solar's 71,690 high efficiency solar panels Goldi 72 GN poly crystalline modules of 335 Wp were used in the project. LS Mills is expected to save approximately 37.668 GWh of electricity per annum and help offset over 35040 tons of CO2 per year.

HCL Technologies has announced a multi-year contract with Hitachi ABB Power Grids to build a new greenfield digital foundation as part of a global transformation program. Through this engagement, HCL will help Hitachi ABB Power Grids establish a new, efficient and modern independent IT organization. The engagement will support Hitachi ABB Power Grids its continued business transformation by reducing dependency on the historic ABB IT services infrastructure, a release by HCL Technologies said.

Best Power Equipments (India) Pvt Ltd (BPE) supplied 2,000 units of UPS and power-back solutions during the COVID-19 crisis, the Noida-headquartered company said in a release. Amidst the crisis, BPE was able to deliver UPS to large hospitals, COVID testing centres, telecom companies, paper mills, government undertakings, airports, etc, across the country, the company said.

Adani Transmission Ltd added 2,536 ckm in FY21 through both the organic and inorganic route. The total transmission network of ATL reached 17,276 ckm, as of March 31, 2021. Meanwhile, ATL has planned capital expenditure of Rs.4,500 crore during FY22. Out of this, Rs.3,000 crore would go towards the power transmission business while the remaining Rs.1,500 crore would be for the power

distribution business. ATL's power transmission network has seen a steady growth from 5,450 ckm as of March 31, 2017 to 17,276 ckm, as of March 31, 2021.

The Expert Appraisal Committee (EAC) of the Union Ministry of Environment, Forest & Climate Change (MoEFCC) has recommended grant of environmental clearance to the 930-mw Kirthai Stage-II hydropower project of Chenab Valley Power Projects Pvt Ltd (**CVPPPL**) in Jammu & Kashmir. CVPPPL is a joint venture company between NHPC, JKSPDC and PTC India Ltd.

Power Grid Corporation of India Ltd (**PGCIL**) recently dedicated a newly-commissioned 400kV transmission line in Tamil Nadu, as part of the "Bharat ka Amrit Mahatsov" celebrations. The transmission line, is an Interstate Transmission System (ISTS) element, and is meant for evacuating power from the 2x500-mw lignite-based thermal power project of NLC India Ltd, in Tamil Nadu. Incidentally, the power generation plant (New Neyveli Thermal Power Station, or NNTPS) was also dedicated to the nation in February this year. This transmission line was commissioned by PGCIL during the second quarter (July to September) of FY21.

Renewable energy will account for over half of JSW Energy's power generation portfolio in the medium term, according to Prashant Jain, Joint MD & CEO, JSW Energy Ltd. Jain said that the company's current installed capacity is around 4.6 GW out of which about 30 per cent was from renewable energy sources. The current renewable energy projects pipeline is 2.6 GW, comprising wind, solar and hydropower. This pipeline would get commissioned in the next 24-30 months, after which the share of renewable in JSW Energy's portfolio would be over 55 per cent.

EPC contractor Vikram Solar, for project owner NTPC, has commissioned what could be the largest single-location solar power project in Uttar Pradesh. In a release, Vikram Solar announced that it has completed an 85-mw grid-connected solar photovoltaic plant for Central PSU NTPC Ltd, at Bilhaur in Kanpur district, Uttar Pradesh. In conjunction with a similar 140-mw plant commissioned for NTPC at the same location, this combined 225-mw plant becomes the largest single-location solar power plant in Uttar Pradesh, the release said. ■



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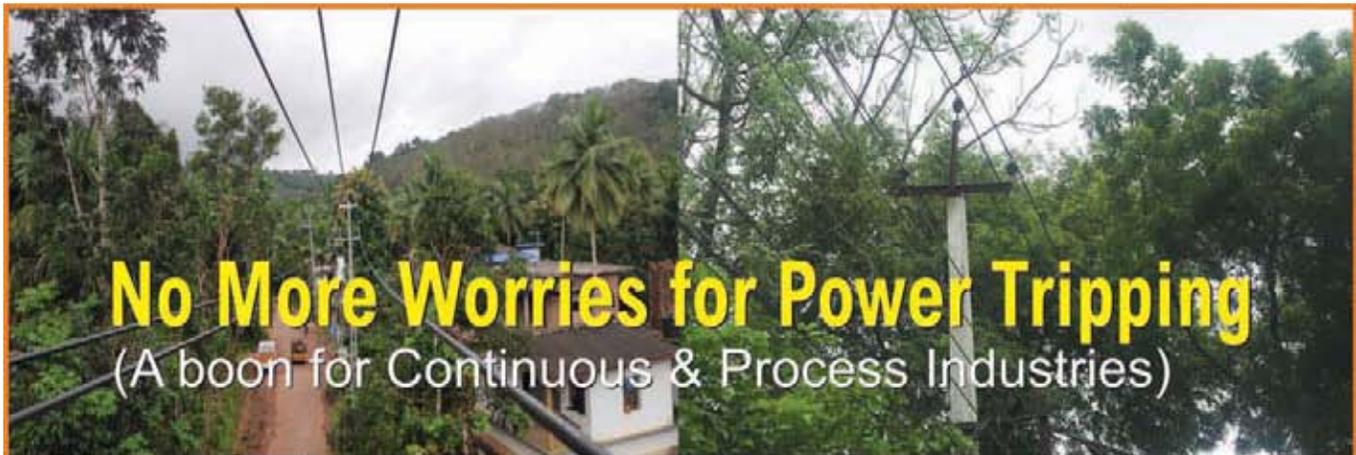
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