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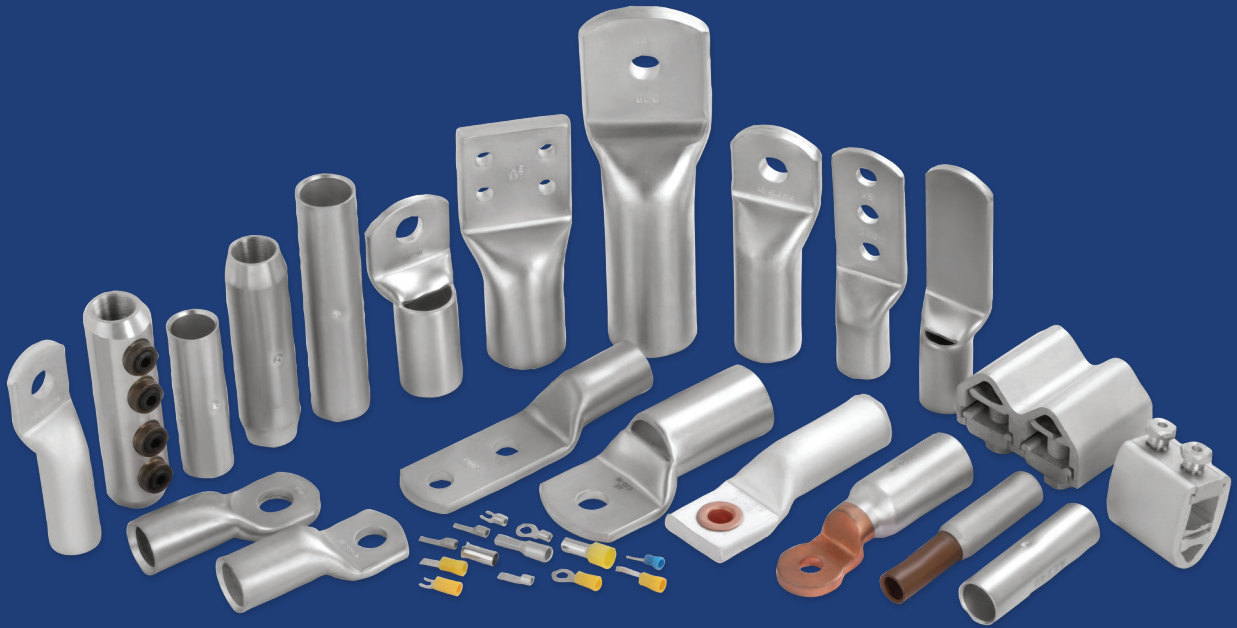


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I will prepare and some day my chance will come

— Abraham Lincoln

Sharpening the focus on power T&D

This edition marks the completion of seven years of “T&D India”. On this commemorative occasion, we would like to thank our readers, advertisers and well wishers for their unflinching support in making T&D India a respectable name in the power- and electrical equipment-related trade media. Over the past three years or so, www.tndindia.com – the online platform of T&D India – has also gained popularity and acceptance, ably complementing the print publication.

When T&D India was conceived, it was meant to address the power transmission and distribution industry – a critical area of the power value chain, but unfortunately, one that did not have a dedicated information medium.

When one analyses the power value chain, one can clearly see the emerging focus areas – green energy, interstate/interregional transmission for renewable energy (RE) evacuation and smart metering. Each of these areas is getting tremendous policy attention and this is reflected in the very ambitious goals that the nation has set itself. Targets like 500 GW of RE capacity by 2030 and 25 crore prepaid meters by 2026 could easily sound preposterous till a few years ago.

What is most interesting to observe is that the current focus areas in power T&D provide tremendous opportunities to the private sector – not just in terms of equipment suppliers and service providers but also developers.

The recent months has seen a marked revival in the bidding process for interstate power transmission schemes under the tariff-based competitive bidding (TBCB) route. It is very encouraging to note that alongside Power Grid Corporation of India Ltd and established private players, a new crop of private developers is surfacing to shoulder the responsibility of building a massive National Grid.

The revamped distribution sector scheme (RDSS) needs special mention. Though RDSS is aiming to address several issues, its emphasis would be on the rollout of 25 crore prepaid smart meters. For RDSS, the government has devised the TOTEX model where the selected developer (officially, the Advance Metering Infrastructure Service Provider or AMISP) will undertake the entire capital and O&M expenditure. There will be no upfront payment by the distribution utility. The AMISP will be repaid over a period of time from the increased earning of the discoms, which would be the expected result of prepaid metering.

It is heartening to note that smart meter manufacturers as well as power T&D contractors are turning into developers (AMISPs) under RDSS.

All in all, the power T&D sector is at a very interesting juncture with each component of the power T&D chain getting unprecedented policy attention. Most importantly, the power T&D sector today is a big avenue for nurturing and boosting the spirit of entrepreneurship.



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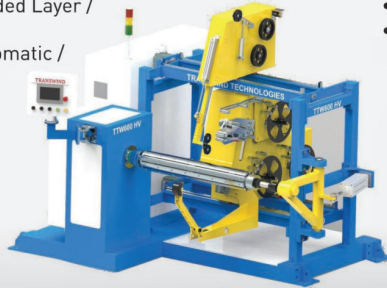
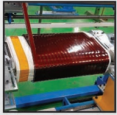
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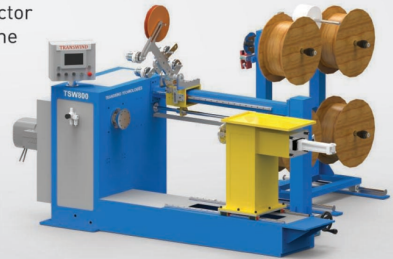
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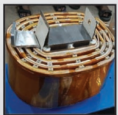
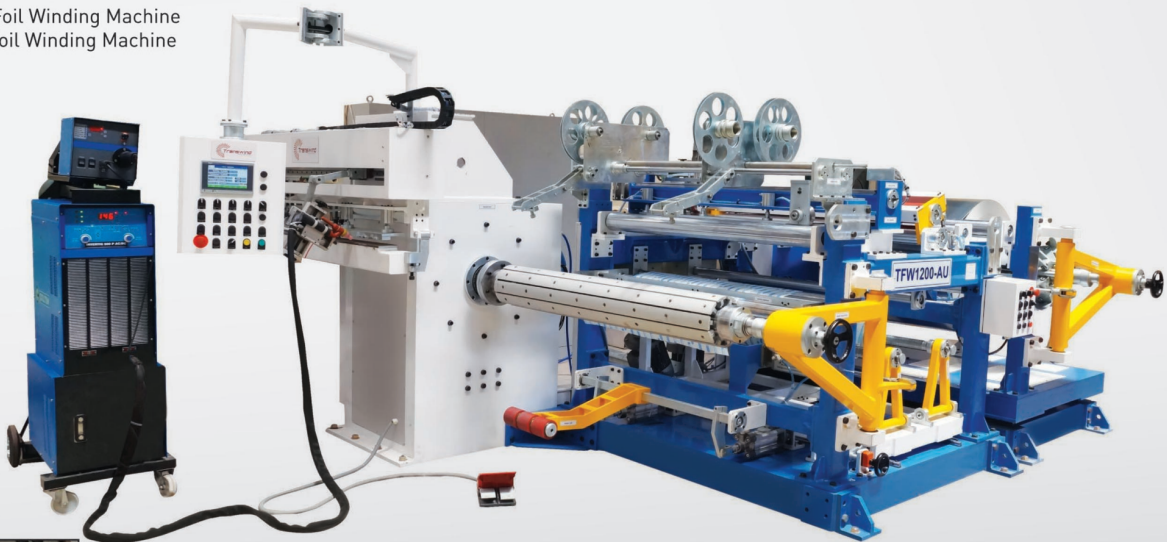
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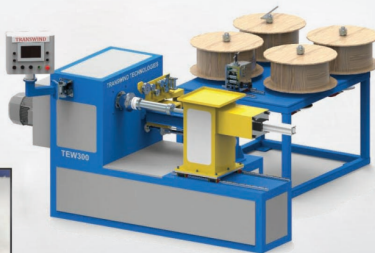
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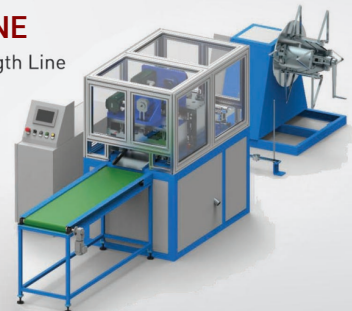
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TN, Maharashtra among top states with highest discom dues

Tamil Nadu and Maharashtra are the top two states with respect to dues payable to discoms, according to information tabled in Parliament.

As of July 24, 2023, Tamil Nadu had current dues of Rs.5,118 crore – the highest among all states/UTs – followed by Maharashtra with Rs.2,713 crore and Karnataka with Rs.2,365 crore. (see table)

It was also informed in Parliament that with the implementation of Electricity (LPS and Related Matters) Rules, 2022, remarkable improvement has been seen in recovery of outstanding dues of suppliers including generating and transmission companies.

The total outstanding dues of states which were at Rs.1,39,747 crore as on June 3, 2022 (the date of implementation of LPS rules) reduced to Rs.69,957 crore as of July 24, 2023, after the payment of 12 equated monthly installments (EMIs). These due include those payable to transmission companies.

DISCOM DUES: TOP 5 STATES

(As of July 24, 2023 in Rs.crore)

State	Balance Dues*	Current Dues
Tamil Nadu	12,560	5,118
Maharashtra	12,595	2,713
Karnataka	9,655	2,365
Rajasthan	8,452	1,711
Jammu & Kashmir	6,376	426
*After 12th EMI		

LPS rules and regulations: On June 3, 2022, Government of India promulgated Electricity (Late Payment Surcharge and Related Matters) Rules, 2022. These rules entail obligations upon discoms to clear their legacy dues as existing on June 3, 2022, in a time bound phased manner in equated monthly installments with benefits of non-applicability of late payment surcharge after June 3, 2022.

These rules also provide framework for time bound clearance of current dues

through establishment of a payment security mechanism and disincentives of progressive withdrawal of access as well as power regulations if the provisions of the rules are not followed. Discoms can avail loans from PFC and REC to clear their dues to generating companies.

Further, under the Revamped Distribution Sector Scheme (RDSS) launched by Government of India, compliance to LPS Rules by discoms has been prescribed under the Result Evaluation Framework for evaluating discoms for availing financial assistance under the scheme.

Gencos dues: As of April 2021, dues payable by discoms to generating companies (gencos) stood at Rs.83,161 crore. These rose to Rs.1,03,725 crore as of April 2022. As of June 3, 2022 (the date of implementation of LPS rules), these mounted further to Rs.1,20,540 crore only to drop significantly to Rs.61,025 crore, as of July 24, 2023, after the payment of 12 EMIs. ■

Power ministry notifies new rules for state subsidy to discoms

The Ministry of Power has recently notified new rules with respect to payment of subsidy by state governments to distribution companies.

The new rules mandate that a quarterly report shall be submitted by the distribution licensee within thirty days from end date of the respective quarter and the State Commission shall examine the report, and issue it within thirty days of submission of the quarterly report.

The report will inter-alia cover the findings regarding raising of demands for subsidy based on accounts of the energy consumed by the subsidised categories; and the subsidy payable to these categories as announced by State Government and the actual payment of subsidy in accordance with Section 65 of the Electricity Act, 2003.

Provision has been made that if subsidy accounting and the raising of bills for subsidy

is not found in accordance with the Act or Rules or Regulations issued there under, the State Commission shall take appropriate action against those responsible for non-compliance as per provisions of the Act.

Under the framework for sustainability, in order to define a definite and reasonable goal for reduction of Aggregate Technical and Commercial (AT&C) loss, it is prescribed that the AT&C loss reduction trajectory would be approved by the State Commissions for tariff determination in accordance with the trajectory agreed by the respective State Governments and approved by the Central Government under any national scheme or programme, or otherwise.

The trajectory for both collection and billing efficiency, for distribution licensee has to be determined by the State Commission, accordingly.

In order to ensure the recovery of full costs

incurred by the distribution licensee in distributing electricity, it has been prescribed that all prudent costs of power procurement, done in a transparent manner, would be taken into account, while approving the tariff.

Similarly, all the prudent costs incurred by the distribution licensee for creating the assets for development and maintenance of distribution system would be accounted for subject to fulfillment of prescribed conditions.

It is also provided that gains or losses accrued to distribution licensee due to deviation from approved AT&C loss reduction trajectory would be shared between the distribution licensee and consumers.

For establishing norms for operation and maintenance of the distribution system, Central Electricity Authority has been mandated to issue guidelines. ■



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India Grid Trust (IndiGrid), India's first power sector investment infrastructure trust (InvIT), experienced some very interesting developments in the recent past. These included winning a greenfield TBCB project, securing additional transmission components under the RTM route and signing of a framework agreement with G R Infraprojects. In this email interview, **Harsh Shah, Chief Executive Officer, India Grid Trust**, tells us more on these developments, whilst maintaining that IndiGrid would continue to remain interested in bidding for both interstate and intrastate TBCB-based transmission schemes. An interaction by **Venugopal Pillai**.

IndiGrid is actively evaluating transmission schemes under TBCB modality

Please confirm that India Grid Trust (IndiGrid) will acquire 100 per cent ownership in Rajgarh Transmission Ltd from GR Infraprojects, only after the project is commissioned, which is by November 2023, as we understand.

India Grid Trust and G R Infraprojects (GRIL) have entered into a framework agreement to acquire 100 per cent stake in Rajgarh Transmission Ltd (RTL), which GRIL had won in March 2022.

IndiGrid shall acquire in one or more tranches 100 per cent economic interest, shareholding and management control in RTL subject to the terms of definitive agreements and requisite regulatory approvals.

As per the TSA, the scheduled project commissioning of RTL is expected by November 2023.

For future TBCB projects, we learn that IndiGrid would be jointly bidding with GRIL. Will there be a joint venture between IndiGrid and GRIL, or is it that IndiGrid (or its subsidiary/subsidiaries) would be the sole developer and that GRIL would be looking after the project execution without any equity involvement? Please discuss.

IndiGrid and GRIL have signed a MoU to jointly bid for identified TBCB (tariff based competitive bidding) transmission projects aggregating to approximately Rs.5,000 crore. The exact structure including whether IndiGrid investing some minority equity or acquire 100 per cent upon commercial operations date (COD), would vary with respect to each identified project depending on the size of the project, any synergies that IndiGrid has through its existing projects, etc.

For the projects identified under the MoU, IndiGrid doesn't intend to be the sole developer.



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We understand that IndiGrid has been assigned an RTM component project with respect to Kallam Transmission. This, as we know, is “augmentation of transformation capacity at Kallam Pooling Station” What is the current status of this project and when is the likely completion?



Yes, IndiGrid has been assigned a transmission scheme associated with Kallam Transmission Ltd (KTL). This project is to be implemented through the regulated tariff mechanism (RTM) route and shall follow the CERC tariff regulations. The scope involves augmenting transformation capacity at Kallam Polling Station by 2x500 MVA, 400/220kV ICTs along with 220kV bays. The estimated capex of the project is Rs.157 crore and the scheduled commissioning date is May 2024.

We have filed for the transmission license and completed the International Competitive Bidding (ICB) to select the EPC contractor. We believe that the project will be commissioned within the stipulated time.

We also understand that Patran Transmission Company Ltd (PTCL) was recently awarded an RTM project entailing the installation of the third transformer at the 1,000-MVA Patran GIS substation. When are you expected to start work on this project? Also, when is the tariff adoption by CERC likely to take place?

Yes, IndiGrid has been assigned a transmission scheme associated with Patran Transmission Company Ltd (KTL). This project is also to be implemented through the regulated tariff mechanism (RTM) route and shall follow the CERC tariff regulations. The scope involves augmenting transformation capacity at Patran Substation by 1x500 MVA, 400/220kV ICT along with 400kV and 220kV bays.

The estimated capex of the project is Rs.65 crore and the scheduled commissioning date is August 2024. We have already started work on this project and have obtained the transmission license. We are now in process of executing the project. RTM projects are awarded under Section 62 of Electricity Act, 2003 and the tariff for such projects is determined by CERC post commissioning of project.

In one of IndiGrid’s official communication, it was stated that IndiGrid has 100 per cent “economic ownership” in PTCL. What exactly does this mean and imply?

As on date, IndiGrid owns 100 per cent equity ownership in Patran Transmission Company Ltd (PTCL).

While IndiGrid had 100 per cent economic ownership since February 2018 onwards, the legal transfer of equity shares of PTCL was done in three tranches, in line with lock-in restrictions in the TSA.

In February 2018, 46 per cent equity stake was acquired and other 28 per cent in November 2018. The balance 28 per cent was acquired in November 2021. The term “economic ownership” means that while IndiGrid does not own 100 per cent equity shares, IndiGrid has 100 per cent control over the cash flows of PTCL, voting rights and pledge over 100 per cent of the equity shares.

Are there any other RTM projects in IndiGrid’s current portfolio?

Yes, in addition to Kallam and Patran, there are augmentations works in Gurgaon-Palwal Transmission Ltd (GPTL), NRSS XXIX Transmission Ltd (NTL) and few other SPVs in IndiGrid’s portfolio.

Would IndiGrid be interested in bidding for intrastate transmission schemes under the TBCB modality? Has IndiGrid bid for any such schemes so far?

IndiGrid is actively evaluating transmission schemes under TBCB modality and would be interested in bidding either independently or jointly for intrastate transmission schemes, subject to SEBI InvIT Regulations.

What is IndiGrid’s current transmission portfolio in terms of number of project SPVs, transmission line length, transformation capacity, etc?

IndiGrid’s transmission portfolio consists of 16 transmission projects—15 operational and one (Kallam Transmission Ltd) under construction. IndiGrid’s transmission portfolio is spread across 19 states and 1 Union Territory with 8,468 ckm of transmission line length and 13 substations aggregating 17,500 MVA of transformation capacity. ■



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The criticality of efficient green energy evacuation

Finding ways to evacuate power efficiently is crucial for achieving India's renewable energy ambitions, notes **Naveen Munjal**

The world will require large and increasing amounts of power in the coming decades, and the global imperative is to produce this power in clean and sustainable ways. However, it isn't enough to just generate power, it is equally important that wastage is eliminated or at least minimized.

Power losses have been an area of concern for far too long. The Economic Survey for 2020-21 suggested that transmission and distribution losses in India's power sector, even until recently, continued to be very high, to the tune of 20 per cent – more than twice the global average. Now, as India works towards its admirably ambitious renewable energy goals, there is need and opportunity to speedily develop and implement solutions for efficient evacuation and transmission of clean energy across the country.

India plans to install 500 GW of non-fossil-based power capacity by 2030. In December 2022, the government outlined a transmission plan to evacuate this power, which entails large-scale establishment of transmission lines, substation capacities, and battery storage to provide uninterrupted power to consumers. The government is also undertaking steps to improve the transmission and distribution infrastructure, even as new private players look with growing interest at transmission, distribution, and other areas of the clean energy chain. These are all encouraging developments, and they will be accelerated by the PM Gati Shakti programme which, it is hoped, will facilitate coordination between the ministries concerned, and expedite the necessary approval processes.

CHALLENGES IN POWER TRANSMISSION

As things currently stand, laying power transmission lines continues to pose significant challenges in various forms – difficult terrain, acquiring right of way (RoW), manpower availability and weather conditions, to name a few. Stretched construction timelines to match up with the rapid growth of RE generation is also an area of concern, with most projects encountering substantial delays. The problem is exacerbated for transmission projects that pass through eco-sensitive regions, owing to a lack of clear demarcation of these areas, non-availability of explicit construction guidelines for such



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projects and the ever-present risk of running into public interest litigation. The Stage-II approval for forest clearances, for instance, is a time-consuming process. It does not help that projects are often delayed owing to inadequate information during the pre-bid stage itself.

Meanwhile, the lead times for procuring major equipment required at power substations—such as gas-insulated switchgear, STATCOMs, 765kV transformers etc. — continues to be as challenging. There is need to develop indigenous manufacturing capabilities for such equipment, and to streamline and standardize the RoW acquisition processes across the country.

MEASURES SO FAR, AND THE WAY FORWARD

The roadmap for the evacuation of upcoming clean-energy capacity should factor all such issues into its timelines. Ideally, it should involve dialogue and partnerships between the industry and the government for identifying and resolving these issues ahead of time. The clean-energy targets that India is working towards can be achieved much faster with timely policy and technology interventions.

The Central government and its agencies, on their part, have already taken certain steps, including the introduction of policies and amendments to the Standard Bidding Guidelines, to address some of the aforesaid challenges and to encourage greater private participation in the sector.

They have had positive effect, with some recent bids seeing as many as 8-10 bidders, on an average. To expedite the award of new projects, bid process timelines have been significantly compressed.

OPPORTUNITIES FOR NEW PLAYERS, AND THE ROLE OF TECHNOLOGY

Today, new private players, including EPC (engineering, procurement and construction) contractors, can enter the power transmission business through the tariff-based competitive bidding route on the back of their prior construction experience.

The country has seen many construction companies too, get into the transmission business.

These developments augur well for the future, because industry reports estimate that India's transmission sector will need investments of upwards of Rs 5 lakh crore to meet the clean energy targets for 2030. The private sector has the capability to mobilize the resources and know-how to execute such projects efficiently and speedily.

The lead times for procuring major equipment required at power substations – such as gas-insulated switchgear, STATCOMs, 765kV transformers etc. – continues to be challenging. There is need to develop indigenous manufacturing capabilities for such equipment, and to streamline and standardize the RoW acquisition processes across the country.

Technologies of the day – such as helicopter stringing, helicopter cranes, artificial intelligence, drone cameras, and more— enable building transmission systems safely and with shorter gestation periods. Monitoring transmission lines has become easier than before with the help of drones. Drones have also helped in locating faults quickly and resolving them. AI-based SCADA systems, meanwhile, are bringing greater efficiency to the operations of substations, with minimal human intervention. The usefulness of such technologies was recently evinced in transmission projects in the hilly terrains of Jammu & Kashmir, Ladakh, Uttarakhand, and the northeastern parts of India.

The time for positive change and purposeful action is upon us. India's ambitions of becoming a low-carbon nation and providing clean and sustainable energy to all, call for dedicated efforts with a long-term vision. How energy is generated, transmitted, and consumed, will all have significant ramifications for not just India's future but the world's too.

About the author: Naveen Munjal is Director – Business Development & Commercial (Conventional), Apraava Energy



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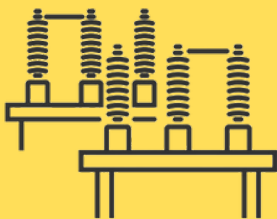
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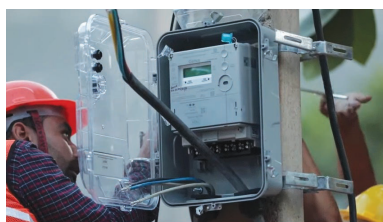
RDSS: Over 20 per cent of sanctioned smart meters awarded so far

According to latest statistics released by the National Smart Grid Mission (NSGM), contracts have been placed for a little over 20 per cent of the total consumer smart meters sanctioned under the Revamped Distribution Sector Scheme (RDSS), as of around July 14, 2023.

Statistics suggest that a total of 20.53 crore consumer smart meters were sanctioned as of July 14, 2023 under RDSS, and of this, contracts for a total of 4.35 crore smart meters were awarded. This represented around 21 per cent of the total volume of smart meters sanctioned.

Here are some statistical highlights:

- Sanctioning of smart meters under RDSS has been a widespread national activity, currently



covering 30 states and Union territories.

- As of given date, 17.85 lakh smart meters were installed under RDSS. Such installations have taken place in only three states – Bihar, Madhya Pradesh and Assam. Bihar had the highest number of smart meters, at 14.27 lakh, installed under RDSS, as of July 14, 2023. This eastern state has also seen the award of all the 23.50 lakh smart meters sanctioned.

- In terms of smart meters sanctioned under RDSS, Tamil Nadu had the highest (at 3 crore), followed by Uttar Pradesh with 2.70 crore, and Maharashtra with 2.36 crore.
- Uttar Pradesh has seen RDSS contracts for 1.33 crore smart meters awarded up to July 14, 2023. This is the highest for any state. Gujarat comes second with 1.08 crore smart meters.
- Award of contracts appears to be moving at a rapid pace in Assam, Chhattisgarh and Andhra Pradesh. Each of these states has awarded 75 per cent or more of the total number of smart meters sanctioned.
- Tamil Nadu, West Bengal, Rajasthan and Kerala are important states where award of contracts for smart meters has yet to begin. Each of these four states has been sanctioned significant number of smart meters – ranging from 1.32 crore in Kerala to 3 crore in Tamil Nadu.

CONSUMER SMART METERING UNDER RDSS: AS OF JULY 14, 2023

State	Number of smart meters		
	Sanctioned	Awarded	Installed
Tamil Nadu	30,000,000	0	0
Uttar Pradesh	26,979,056	13,281,763	0
Maharashtra	23,564,747	1,075,890	0
West Bengal	20,717,969	0	0
Gujarat	16,481,871	10,771,200	0
Rajasthan	14,274,956	0	0
Kerala	13,289,361	0	0
Madhya Pradesh	12,980,102	2,285,074	36,304
Punjab	8,784,807	0	0
Haryana	7,405,618	0	0
Assam	6,364,798	4,954,316	321,288
Chhattisgarh	5,962,115	4,461,743	0
Andhra Pradesh	5,608,846	4,319,150	0
Himachal Pradesh	2,800,945	0	0
Bihar	2,350,000	2,350,000	1,427,070
Total for above states (A)	197,565,191	43,499,136	1,784,662
Other States/UTs (B)	7,761,664	0	0
Total for RDSS (A + B = C)	205,326,855	43,499,136	1,784,662
Total for other schemes (D)	24,546,715	12,671,450	4,901,649
Grand Total (C + D)	229,873,570	56,170,586	6,686,311

Compiled by T&D India, based on NSGM statistics

OTHER SCHEMES

Apart from RDSS, smart meters are also being rolled out under other schemes like Integrated Power Development Scheme (IPDS), National Smart Grid Mission (NSGM), Pradhan Mantri Development Package (NMDP), etc. Under all these schemes put together, a total of 2.45 crore smart meters have been sanctioned out of which 1.27 crore have been awarded. As of July 14, 2023, the total number of smart meters installed so far stood at around 49.02 lakh.

FEEDER AND DT METERS

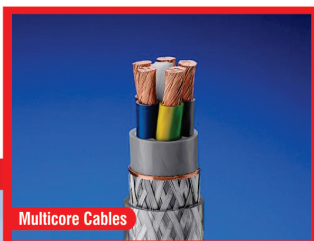
The entire discussion so far revolves around consumer smart meters alone. However, RDSS also envisages the installation of feeder meters and DT (distribution transformer) meters. It may be mentioned that other smart meter-schemes discussed above do not entail feeder and DT meters.

As of July 14, 2023, a total of 1.94 lakh feeder meters were sanctioned against which 0.39 lakh were awarded (all under RDSS, as explained). In the case of DT meters, as against 54.54 lakh units sanctioned, contracts for 19.04 lakh DT meters were awarded, once again, all under RDSS. ■

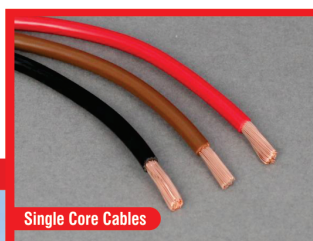
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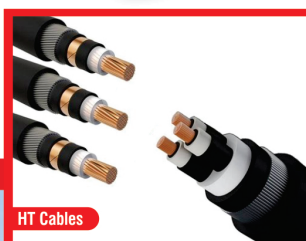
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Numeric has a rich legacy of over 30 years in the UPS business. Since the past ten years or so, Numeric is part of the Legrand Group. In this exclusive interaction, we have **Satpal Singh, CEO, Numeric**, discussing a range of company and industry issues, especially touching upon how “Digital India” is positively impacting the UPS business. Speaking on the core values of Numeric and the Legrand Group, Satpal Singh emphasizes that with innovation as the company’s core business philosophy, Numeric has been able to address the requirements of its customers with need-based solutions.

Digitization is driving the demand for UPS systems

Numeric is known for regularly introducing innovative UPS products. Take us through the important recent launches.

We design our products and solutions keeping innovation at the core of our development - innovation not for the sake of it, but need-based innovation that will cater to the customer’s needs and address their pain points.

At Numeric, we are driven by four growth drivers - Innovation, Smart Solutions, Power to People and Pre-emptive Partnering.

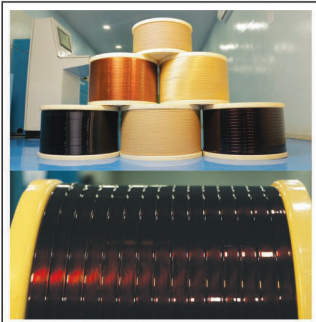
With customer as the focus, everything that we do is driven by these growth pillars. Being part of Group brand Legrand also gives us the distinct advantage of being a GLOCAL company – global expertise with deep local market knowledge.

From the launch of Keor series in 2017 where we pioneered the front access for the UPS systems, to plug-and-play products that were launched in 2020 for the residential and commercial segments, to the IF award winning stylish Keor MOD, the modular 3 phase UPS Keor XPE catering to the evolving needs of data centers or be it sustainable products like the single phase UPS Premius that evinces our commitment towards a sustainable future; innovation and need based solution has always been the central theme of our offer.



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In general, how is the government's push to "Digital India" boosting the demand for UPS systems?

Many digital initiatives under "Digital India" programs, for example smart classrooms, digital infrastructure like smart city programs, e-governance, digital banking etc has pushed the adoption across the country. This acceleration and the rise of "Digital First" initiatives mean increased data that need to be available on demand. This has given rise to the need for continuous power supply and uninterrupted power even in case of power disruptions.

Digitization is no longer restricted to just one segment; it now spans from manufacturing to education to banking to healthcare to governance. Digitization has gained rapid pace in every segment.

This has accelerated the need for quality and continuous power for seamless workflow and management. We are seeing a growing demand for uninterrupted power supply, and this will only continue to rise as more activities come under the purview of digitalisation.

We perceive that the market for UPS solutions is rapidly moving from metropolitan and tier-I cities to tier-II cities and towns. What is your take on the matter?

While the need for uninterrupted power has increased in tier-II cities and smaller towns, the demand in tier-1 cities is still on the rise for the evolved usage of modern-day applications. The expansion of smart cities, digital governance, online education, and the accessibility to internet has increased the demand for UPS across the country.

With personal computers gradually giving way to laptops and hand-held devices, do you feel that the market for UPS solutions in the residential sector has declined?

With IoT and smart devices, residential segment has become technologically advanced. The modern household is equipped with multiple electronic devices like computers, laptops, tablets, smartphones, smart TVs, gaming consoles, and many other smart devices that have made our lives easier and more convenient, which means, the connected devices in order to function seamlessly need to have uninterrupted continuity. In fact, the demand for UPS in residential segments is on the rise, and we continue to hold the leadership position in line interactive UPS for 30 consecutive years.

How do you look at the growing demand for UPS solutions in the healthcare segment (both medical equipment and medical facilities/labs)?

Healthcare has been one of the fastest growing segments for us. From telemedicine consultations to advanced technologies in healthcare management, all of this has boosted the need for UPS in this segment. With rapid advancement in technology, the diagnostic machines and advanced healthcare devices are sensitive to the quality and availability of power. The need for UPS in healthcare is not just restricted to critical infrastructure but also lighting and IT applications. Numeric offers customized solutions to healthcare segment depending on the application and the criticality of its application. Smaller healthcare facilities like polyclinics and telemedicine centers typically require smaller UPS systems to provide backup power for critical equipment like computers, telecommunication systems, and medical devices.

On the other hand, larger healthcare facilities like hospitals require much larger UPS systems to provide backup power for a wide range of critical applications like lighting, heating, and cooling systems, IT infrastructure, diagnostic and imaging equipment etc.

It's important to have a reliable and robust UPS system in place in healthcare facilities to ensure uninterrupted power supply and prevent any disruption in critical medical services.

What would you regard as the biggest demand drivers for UPS solutions in the coming years?

The demand for UPS comes from multi segments. The rise in data centers, digitalisation, smart cities, investment in infrastructure, growing healthcare and manufacturing activities, connected homes will



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all contribute to the demand for UPS in the coming years. Numeric is well poised to address every segment with its wide range of products from 600 VA to 21 MW and service solutions through a network of more than 250+ direct service centres and +1200 Service professionals ensuring uninterrupted power at all times.

Digitization is no longer restricted to just one segment; it now spans from manufacturing to education to banking to healthcare to governance.

Speaking of industry-related issues, we learn that there is currently a shortage of semiconductors. What is the real situation, and how is Numeric responding to the same?

The global demand and supply balance has been significantly impacted by the COVID-19 pandemic, leading to changes in various industries, including the semiconductor market. In the last three years, the situation has evolved significantly, making it critical for businesses to be more adaptable and agile to the changing market conditions.

However, Numeric was able to navigate the concerns early on and took proactive steps to mitigate any potential impact on the company's operations and customers. Numeric was able to align its supplies with its long-term strategic partners and ensure that its customers received the necessary support during and after the pandemic period.

On another industry issue, there is a view that India's domestic testing facilities, especially for high kVA UPS systems are inadequate. What is your view?

Numeric's commitment to providing high-quality products to its customers is evident in its investment in testing facilities for 3-phase products. This enables Numeric to maintain strict quality control measures throughout the production process, from design to manufacturing and testing, ensuring that all products meet or exceed the required industry standards and specifications, and customers can rely on Numeric to deliver products of the highest quality consistently. Having its own testing facilities also allows Numeric to be more responsive to customer needs and feedback, making it easier to identify areas for improvement and make necessary adjustments to enhance product quality.

It has been a little over a decade since Numeric came into the Legrand India fold. How has the brand grown post-acquisition, and how do you see the years ahead for Numeric?

Numeric has a rich legacy of over 30 years of expertise in UPS industry. Being part of Group Legrand has given us the distinct advantage of being a GLOCAL company – leveraging the global expertise of brand Legrand combined with our deep local market knowledge. With innovation at the centre, we have been able to address the requirements of our customers with our need based solutions.

Service is an extremely critical component in our industry. We have the distinction of having the largest service network in the industry which is completely tech-enabled, with 250+ direct service centres and over 1,200+ service professionals. This ensures that we have our customers covered across the length and breadth of the country, and we are the only brand to have the advantage of being able to serve our customers even in the remotest of locations. With India at a steady and steadfast growth, we see a bright future driven by growth. ■



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DISTRIBUTORS



CEA proposes guidelines for O&M of co-located TBCB assets

The Central Electricity Authority (CEA) has issued draft guidelines for operation & maintenance (O&M) of assets created under the tariff-based competitive bidding (TBCB) mechanism.

CEA has prepared a draft memorandum of understanding (MoU) that will be part of the standard bidding documents for TBCB power transmission projects, going forward.

In doing this, the Union power ministry is trying to address the issue of coordination between owners of co-located assets. It may be mentioned that new power transmission schemes under the TBCB route very often result in the new transmission service provider (TSP) creating associated bays at both ends of the new transmission line. These bays are typically located within existing substations.

This co-location could potentially result in differences between the existing owner and the new TSP, with respect to O&M of assets.

CEA has acknowledged that in case of the assets of the new TSP that are co-located in the existing substation, detailed scope of works as well as the roles and responsibilities of the New TSP and existing TSP have not been clearly defined in the TBCB bid documents.

One important constituent of the new guidelines is that O&M charges to be paid by the new TSP to the existing substation owner, for the relevant year, shall be 30 per cent of the normative O&M expenses of relevant voltage level and transformer capacity as specified for that particular year in Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations as issued from time to time.

The guidelines also stipulate that both parties – the existing substation owner and the new TSP – shall nominate a nodal officer for coordination of all O&M-related matters.

The guidelines relate to bay terminal equipment or terminal equipment associated

with transformation capacity enhancement, voltage upgrade works, creation of new voltage level at existing substation, etc, which results in addition of transformers.

BACKGROUND

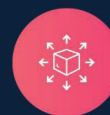
Responding to the subject matter raised by Electric Power Transmission Association (EPTA), the Union power ministry, in November 2022, directed CEA to constitute a committee to deliberate on issues raised by EPTA and to bring about clarity on the roles of the existing substation owner and the new TSP on O&M works related to co-located assets created under the TBCB route. The CEA committee submitted its report in February 2023. Further, CEA was directed by the Secretary (Power), in a meeting held on March 28, 2023, to formulate requisite guidelines, which have now been issued. ■

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Indian electrical equipment industry grows by a healthy 13pc in FY23

According to apex industry body IEEMA, the electrical and industrial electronics industry has witnessed a record double-digit growth of 13 per cent in FY23.

"Industry hunger for growth, coupled with positive policy changes and various initiatives undertaken by the Government and industry have led revival of the sector," IEEMA said in a release.

The growth rate was worked out by IEEMA (Indian Electrical & Electronics Manufacturers' Association) based on the actual performance of its member companies that represent around 90 per cent of the total industry.

A substantial improvement was witnessed in the Q1 and Q3 of FY23 when the industry grew by 28.4 per cent and 15.5 per cent, respectively.

The FY23 growth of 13 per cent was propelled by key segments like transformers (FY23 growth: 17.5 per cent), cables (19.4 per cent), meters (15 per cent) and rotating machines (5.7 per cent).

EXPORTS

For the electrical equipment industry, FY23 was a landmark year with respect to exports that grew to Rs.94,169 crore. Over the nine-year period from FY14, exports have growth at an annually compounded rate of 13.3 per cent, IEEMA said. The apex body has set an exports target of \$25 billion by 2030.

EMERGING GLOBAL LEADER

Rohit Pathak, President, IEEMA, said, "India has made a conscious call that as we focus on growth, we will do this in a responsible manner and focus on the Green Transition. As we Build Green (~350 GW of RE electricity over the next 8-10 years will be the largest build out



globally), we will have the opportunity to emerge as a global leader in several of the new technologies & solutions for generation, storage (including grid storage) and consumption. Having made strong progress in Make in India over the past few years, we need to now focus on innovation, with greater emphasis on R&D and stronger engagement of industry with academia and startups - move from Make in India to Imagine in India. We are also working with MoP on how the Indian Testing Facility infrastructure can be strengthened and made world class."

GROWTH MOMENTUM

According to Hamza Arsiwala, President-Elect, IEEMA, "We believe that this growth momentum will be sustained since major chunk of transmission and distribution projects are likely to be ordered in next fiscal. The sector seems to be reviving strongly. The government is taking proactive steps to achieve the RE generation targets. However, there are still concern areas which have led to decline in growth of some of the segments."

EXPORT TARGETS

Sunil Singhvi, Vice President, IEEMA, said, "Exports have grown more than 3 times in the last 9 years. For the year 2022-23 the Indian electrical industry recorded an increase of 30 per cent as compared to last year. IEEMA's Vision is for the industry to achieve exports of \$25 billion by 2030. For achieving this target IEEMA is working closely with government and industry on both inward and outward measures. We would welcome and will actively work with various stakeholders to make outreach efforts to tap the new markets."

GLOBAL FOOTPRINT

"IEEMA will increase its outreach internationally this year, we will mount business delegations, explore new alliances to help Indian industry to increase its global footprint. We will work with the Government to explore export promotion measures as well," noted Charu Mathur, Director General, IEEMA. ■

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Energy storage company Sheru recently partnered with power utility BSES Rajdhani Power Ltd to set up India's first vehicle-to-grid (V2G) EV battery swapping station in New Delhi. In this interaction, we have **Ankit Mittal, Co-founder & CEO, Sheru**, expounding on V2G technology whilst explaining the criticality of this technology in the EV ecosystem. Mittal is confident that for a country like India where EVs are seeing rapidly growing acceptance, EV batteries can provide much needed energy-storage support to the power grid. An interview by **Venugopal Pillai**.

There is immense scope for batteries to support the power grid

Let us start by understanding, in simple terms, what the concept of V2G (vehicle to grid) technology is.

V2G (Vehicle to Grid) technology allows the battery in an electric vehicle (EV) to be used as an energy storage device. It allows the EV to both receive energy as well as send it back to the grid – hence Vehicle to Grid. This then opens up the possibility of using the battery for a range of grid scale applications.

We further understand that Sheru is integrating V2G technology with battery swapping. Please tell us more.

Battery swapping is a part of the EV ecosystem where EVs simply swap their empty battery for fully charged ones at battery swapping stations. We have patented an energy vending machine which charges these batteries, while also sending energy back to the grid when needed. This bi-directionality allows it to act similar to V2G, only that in this case the swapping station interacts with the grid rather than individual vehicles.

As we appreciate, Sheru's ultimate goal is to create a virtual energy storage platform by using EV batteries. Please elaborate.

We see the immense scope for using batteries to support the power grid. India, and the world, is seeing a concurrent rise in the addition of renewable energy as well as the uptake of EVs. The large addition of renewable energy needs energy storage solutions to support it. At the same time, batteries, whether in EVs or at swapping stations, are not used throughout the





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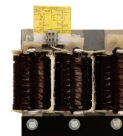
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day and have substantial idle times. Our goal is to aggregate these batteries from any EV and create a virtual energy storage platform that can be used for various grid applications.

Tell us more about your partnership with BSES Rajdhani, highlighting the benefits that will accrue to both the utility and EV owners.

For the utility, there is the need for energy storage to support the grid during times of high demand. Energy storage allows utilities to avoid having to undertake expensive capital expenditures and upgrade the grid to meet this demand. It also allows us to use the full potential of a battery at a swapping station as we also use it for energy storage. For EV owners, or battery owners, there is an additional revenue stream as their batteries are being used for the energy storage network, which helps them recoup the investment in an EV sooner.

How many bi-directional swapping stations will be set up to start with? Is there a plan to increase them in the time to come?

We plan to scale it up to 10,000 in the next 24-30 months.

What would be average energy available (in terms of kWh or MWh) in the station?

The energy available would vary between 30-100 kWh.

At the practical level, how does a battery swapping station work, given that EV battery types/models could vary depending on the type of the electric vehicle? Will you store different types of batteries to be able to cater to a wide range of EV owners?

We work with e-rickshaws and use only one type of battery. And the same battery can also be used for 2-wheelers as well. So the battery swapping station has a number of batteries of the same kind, with EVs from 2-wheeler and 3-wheeler segments being able to use them.

If, for some reason, an EV owner cannot swap his battery, then will the swapping station have a supporting EV battery charger?

The swapping station has more batteries than the number of vehicles it caters to, precisely to avoid this

situation. An EV will always have a fully charged battery available for it at the swapping station.

Is there any movement in the direction of standardization of EV batteries?

Yes, there is a transition towards standardization of EV batteries. And yes, manufacturers are collaborating towards the same.

Returning to SES Rajdhani, is this Sheru's first collaboration with a power distribution utility?

Yes, it is.

Are there plans to forge similar partnerships with other utilities, say BSES Yamuna – a group entity of BSES Rajdhani?

We are working on similar partnerships with other utilities, and will be announcing them in the near future.

When do you anticipate the first bi-directional EV swapping station under the partnership with BSES Rajdhani to come up?

It's already live!

We appreciate that EV charging stations and EV battery swapping stations will together be the key supporting elements. How do you see the growth and co-existence of these two segments, in India?

Charging stations and swapping stations cater to different users in the EV ecosystem. For those that want the least downtime, do not want to invest upfront in the battery, and to own an EV without having to worry about upkeep of the battery, swapping makes perfect sense. And we see this primarily in the commercial segment where downtime, capex, and upkeep are points to keep in mind while investing in the asset.

On the other hand, charging makes sense for private vehicles which work on longer charging times (or the occasional fast charger), and also sees consumer preference to own the asset.

Ultimately, the EV ecosystem will require a variety of solutions for different needs and we feel that there is immense opportunity for both charging as well as swapping to grow in India. ■



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Enhancing electrical safety in the wire and cable industry

When it comes to the wire and cable industry, safety is uncompromising and a critical aspect for many brands of repute, notes
Hemant Gadhave.

While the wire and cable market is congested with many unorganized sector firms. It has been observed that manufacturers in the unorganized sector use subpar materials with insufficient as well as poorer copper conductivity. The small amount of copper in these poor conductivity wires will also increase the end user's power consumption and result in conductor heating when they are used for work. Because the low-quality insulations cannot withstand this temperature, the insulation breaks down, posing an electrical or fire hazard.

According to research, it is the toxic gases emitted during the burning of the insulating material that cause casualties in a short-circuit-induced fire, not the fire itself. Clearly, these inferior materials prove to be fatal in the event of an unintentional fire. When dealing with cables and wires the following protocols should be followed:

Graded Products: To ensure additional safety, consumers can look out for products

with the "S-Mark" product safety certification from the Standardization, Testing and Quality Certification (STQC) Directorate. Goods must comply with the International Electro-technical Commission's (IEC) rules in order to meet applicable safety requirements. The presence of the SAFETY Mark also signifies the presence of internal safeguards against fire and electrical hazards. When purchasing wires and cables, one can keep an eye out for these markings.

Consumer Awareness: Consumers lack technical knowledge, particularly with relation to items such as cables. Consumers must understand and be aware of these standards,



and at the same time, reputable businesses must also continue to manufacture goods with user safety and ensure that user safety comes first.

Adhering to installation practices: Correct wire and cable installation by the end user is also critical. A wire installation guideline (IS732: Code Of Practice For Electrical Wiring Installations) exists, and it should be followed throughout installation. For wire laying via conduit, the proper size must be utilized while ensuring generous usage of wires. The appropriate size of conduit is critical because it provides the most area for heat dissipation. If heat dissipation is insufficient, it (heat) will deteriorate the insulation over time, posing a fire/electrical hazard.

Wiring inspections: Connection of wire is another important factor. Loose connection will generate spark and due to spark temperature will rise. Over a period, this temperature rise will deteriorate insulation and further lead to fire/electrical hazard. It is important to ensure that no loose connections must be made during installation. As a result, excellent installation practices are critical for maintaining the health of the wire system. Checking for loose wiring is an additional step that should be followed, especially during installation of new appliances.

In terms of product advancements, there have been several improvements in product with regard to consumer safety. Flame Retardant (FR), Flame Retardant Low Smoke and Halogen (FR-LSH), and Halogen Free Flame Retardant (HFFR) are new fire retardants designed with human safety in mind.

Currently, the wire and cable sector is undergoing several advancements in order to fulfill the changing needs of its customers. ■

About the author:
Hemant Gadhave is
Senior Vice President Business at
Panasonic Life Solutions India

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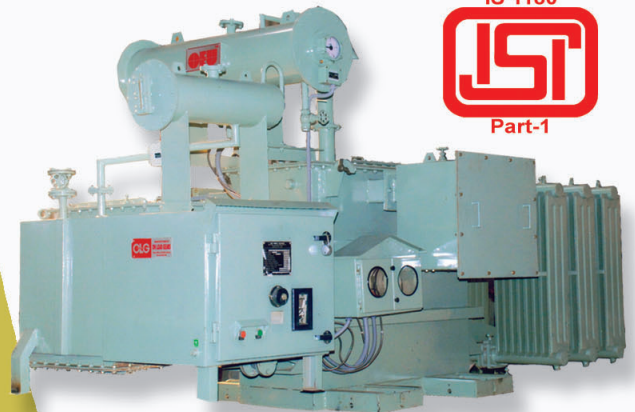
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Interregional electricity transfer grows 3.6 per cent in FY23

Interregional electricity transfer of electricity aggregated 236153 million kwh (MU or million units) in FY23, growing modestly by 3.6 per cent over FY22.

According to a special study by T&D India, based on official statistics released by Central Electricity Authority (CEA), exports from WR to NR (denoted as WR-NR) continued to be the biggest component of interregional transfer with a share of 27 per cent in the total interregional electricity transfer.

Here are some other striking observations:

- Though WR-NR continued to be the biggest component of interregional



T-1: REGIONAL IMPORTS & EXPORTS

(Apr-Mar FY23, in MU)

Region	Imports	Exports	Net Imports*
NR	99,345	33,024	66,321
WR	58,260	101,610	-43,350
SR	63,166	19,964	43,202
ER	12,055	76,160	-64,104
NER	3,327	5,396	-2,069
Total	236,153	236,153	0

*(-) indicates "net exports"

T-2: REGIONAL IMPORTS & EXPORTS

(Apr-Mar FY22, in MU)

Region	Imports	Exports	Net Imports*
NR	107,171	28,536	78,634
WR	47,735	108,658	-60,923
SR	59,115	15,506	43,610
ER	10,311	71,155	-60,844
NER	3,588	4,065	-477
Total	227,920	227,920	0

*(-) indicates "net exports"

transfer, the total quantum of WR-NR transfer was 15 per cent lower in FY23 as compared with FY22.

- NR continued to be the biggest net importer of electricity in FY23. However, in FY23, net imports by NR stood at 66,321 MU, which was much lower than 78,634 MU in FY22. This was also reflected in the fact that while imports by NR fell 7.3 per cent in FY23, exports rose sharply by 15.7 per cent.
- NR and SR were net importers of electricity, while the remaining three regions – WR, ER and NER – were net exporters.

T-3: REGIONAL IMPORTS & EXPORTS

(FY23 vs FY22, in %)

Region	Imports	Exports
NR	-7.3	15.7
WR	22.0	-6.5
SR	6.9	28.8
ER	16.9	7.0
NER	-7.3	32.7
Total	3.6	3.6

- WR was less of a net exporter in FY23. Exports from WR fell by 6.5 per cent in FY23 that was compounded by a massive 22 per cent increase in imports.
- ER was a bigger net exporter in FY23, to the tune of 64,104 MU. Exports from ER grew by 7 per cent to reach 76,160 MU. Imports by ER also grew by 16.9 per cent, but the impact was not much as the quantum of imports – at 12,055 MU in FY23 – was much lower than exports.
- Imports by SR rose by 6.9 per cent to reach 63,166 MU in FY23 from 59,115 MU in FY22. Exports also grew by 28.8 per cent from 15,506 MU in FY22 to 19,964 MU in FY23.
- NER, the smallest regional grid with respect to quantum of interregional transfer, did well in FY23. It was a bigger net exporter of electricity to the tune of 2,069 MU in FY23, significantly higher than 477 MU in FY22. It may be mentioned that exports from NER to ER nearly doubled to reach 1,962 MU in FY23..



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- Distributors and direct customers
- Renewables

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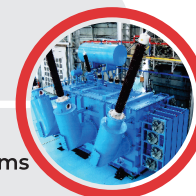
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Digital Solutions for Energy Sector

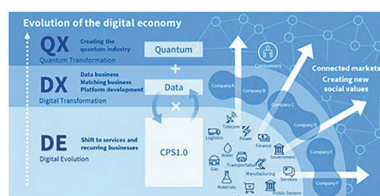
The shift to digital is advancing in every business field, making efficient, accurate data process possible. The way business is done in power plants will also change. Various types of data must be utilized to boost the asset value of equipment and facilities in all aspects, notes **Mr. Takehiko Matsushita**.

Toshiba Group has identified the digital evolution (DE), digital transformation (DX), and quantum transformation (QX) strategy to respond to changes in the coming digital economy in its new management policy announced on June 2, 2022.

The Group will firstly pursue DE thoroughly, in activities that use digital technology to improve value chains. This will create an environment on the basis of software defined, enhancing delivery of services and realize recurring business. That will be followed by DX, the stage of building platforms based on DE. The Group will move further forward with QX, a quantum world where platforms are connected across industries.

EVOLUTION OF THE DIGITAL ECONOMY

Drawing on over 150 years of knowhow and expertise, Toshiba has a wide range of industrial IoT (IIoT) services line-up to support energy, infrastructure, manufacturing and logistic industries. These services are now showcased on Toshiba SPINEX Marketplace, Toshiba's IIoT service portal.



Toshiba's solutions to support digital transformation in energy sector include failure prediction and performance monitoring in power plants; AI-based energy management system for stable renewable power supply; and virtual power plant for a more efficient energy supply and use in daily life.

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REINFORCING THE SPINE OF INDIA'S ENERGY INFRASTRUCTURE

In India, Toshiba is ready to promote digital transformation in energy sector through its subsidiary, Toshiba JSW Power Systems (Toshiba JSW). Toshiba JSW is a long standing partner to India's evolving energy demands and others high quality maintenance services to thermal plants. Now its focus is to implement state-of-art technologies and processes to maintain, renovate, and modernise existing thermal plants.

EtaPROTM is an effective digital solution for 'preventive maintenance' to modernize thermal plants. Generating stably and efficiently and avoiding energy loss from device breakdowns or power plant shutdowns helps to reduce CO2 emissions. Toshiba JSW is excited about the possibility to contribute to India through providing advanced digital IIoT solutions like EtaPROTM for the thermal plants in India.

In addition, Toshiba JSW provides Carbon Dioxide Capture Utilization and Storage (CCUS) solution, which helps to separate and capture CO2 from its source, such as thermal power plants. The captured CO2 can later be used in a different form for a different purpose. Toshiba JSW is committed to help improve and modernize Indian thermal power sector, resulting in transition towards a carbon neutral society.

Aligned with its philosophy "Committed to People, Committed to the Future.", Toshiba will continue to harness the power of data and maximize its potential to take on the challenge of achieving carbon neutrality and a circular economy for a new day.

About the author: Mr. Takehiko Matsushita is Managing Director of Toshiba JSW Power Systems Pvt Ltd.

Appointed in July 2022, Mr. Matsushita has pledged to provide world-class maintenance services to thermal power plants in India, and contribute to India's increasing energy demand while keep in mind environmental considerations. Before the appointment, Mr. Matsushita has led the acquisition of EtaPROTM business from US's GP Strategies Corporation in 2021. He is now ready to proudly introduce this solution to India.



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Sterlite Power has secured multiple new orders worth around Rs.1,400 crore across its 'Solutions' business during the fourth quarter (Q4: January to March) of FY23. The "Solutions" business caters to products and specialized EPC. In a release, Sterlite Power said that these new orders in Q4 have taken the company's total order inflow for the Solutions business in FY23 to Rs.5,200 crore. The company has secured a major order from Power Grid Corporation of India Ltd (PGCIL) to upgrade/uprate its 400kV Jharsuguda/Sundargarh - Rourkela line, part of the larger Eastern Region Expansion Scheme – XXIX, to deploy its state-of-the-art reconductoring solution. This will significantly help in unlocking the latent potential capacity of the existing Transmission corridor by 1.5 times, while reducing the additional Right of Way. In addition, Sterlite Power would be building 220kV double circuit transmission lines for Serentica Renewables, the group's renewable energy arm. The company will build the transmission corridors that will enable evacuation of renewable energy from the upcoming solar and wind parks in Rajasthan and Karnataka, to the national grid. In Product manufacturing, the company has bagged major orders for conductors and OPGW (Optical Ground Wire) from eminent customers in the SAARC region. For OPGW, orders were received from L&T for its 765kV Navasari – Padghe transmission corridor as well as MTCIL (Maharashtra Transmission Communication Infrastructure Ltd) for its 132kV, 220kV and 400kV transmission lines.

GMR Power & Urban Infra Ltd said that its step-down subsidiary **GMR Smart Electricity Distribution Pvt Ltd (GSEDPL)** has received a letter of intent from two UP state discoms —Purvanchal Vidyut Vitran Nigam Ltd (PVVNL) and Dakshinanchal Vidyut Vitran Nigam Ltd (DVVNL) — to implement smart metering project in these zones: Varanasi, Azamgarh and Prayagraj (PVVNL); Agra and Aligarh (DVVNL). As per the mandate, GSEDPL will install, integrate and maintain 75.69 lakh smart meters in the aforementioned zones. This Advanced Metering Infrastructure (AMI) project shall include supply, installation,

integration, commissioning and operation & maintenance of smart meters on DBFOOT basis backed by state-of-the-art technology and software solutions for end-to-end automated system management. The project will be executed under Revamped Distribution Sector Scheme (RDSS) and is expected to reduce the AT&C losses in the designated area and improve operational and collection efficiency of UP discoms, the release added.

Larsen & Toubro's Power Transmission & Distribution (PTD) business has secured new orders in India and abroad. On the domestic front, the Business has won an order to implement SCADA/DMS and related IT infrastructure for urban area power distribution systems in central Gujarat. The scope also involves information storage & retrieval, front end processing, outage management, network management, dispatcher training simulation, local data monitoring etc. with the requisite security systems. Another order has been secured to build a 400kV double-circuit transmission line in Jharkhand. The 133-km line is associated with the evacuation of power from a generating station, the release said. In the Middle East, the PTD Business has received an order for construction of a ± 525 kV high voltage direct current (HVDC) transmission segment. This link is part of a large capacity, voltage source converter (VSC)-based HVDC system that connects Neom Industrial City and Yanbu city in western Saudi Arabia. In the Sarawak region of Malaysia, the Business, in consortium, has bagged an order to establish a 275kV substation. Once completed, the project will help improve power supply reliability in major load centers on the northwest coast of the island of Borneo.

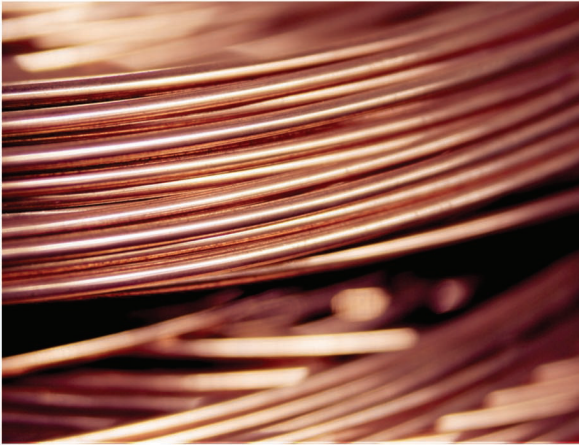
Transformers & Rectifiers (India) Ltd, in a stock exchange communication, said that it has won an order from Power Grid Corporation of India Ltd (PGCIL) for power transformers. The order, valued at Rs.134 crore, has taken the company's outstanding order book, as of July 26, 2023, date, to Rs.1,955 crore. The order involves design, engineering, manufacture, testing and

supply of six 500 MVA, 400/220/33kV transformers, to be completed within 15 months.

Kalpataru Projects International Ltd (KPIL) and its international subsidiaries have secured new orders/notification of awards of Rs.2,261 crore, KPIL said in a stock exchange filing. These orders includes mandates worth Rs.2,036 crore for power T&D projects in the overseas markets.

Siemens Ltd, in consortium with Rail Vikas Nigam Ltd (RVNL), has secured an order from Mumbai Metropolitan Region Development Authority (MMRDA) for electrification of Mumbai Metro Line 2B. The share of Siemens as part of the consortium is Rs.228 crore while that of RVNL share is Rs.149 crore. Siemens Limited will manufacture, install and commission rail electrification solutions and Supervisory Control and Data Acquisition (SCADA) systems, covering 20 stations and one depot. On its part, RVNL will be commissioning Receiving Substations (RSS) solutions.

Suzlon Group has announced a new order win for the development of a 47.6-mw wind power project for KP Group. The project is located at Vagra in Bharuch district in Gujarat and is expected to be commissioned in 2024. Suzlon will supply its S133 wind turbines (equipment supply) and supervise execution and commissioning of the project. Suzlon will also provide comprehensive operations and maintenance services post-commissioning, a release from Suzlon said. In a subsequent development, Suzlon also announced a new order win for the development of a 100.8 MW wind power project for Everrenew Energy Pvt Ltd. Suzlon will install 48 wind turbine generators (WTGs) of their S120 – 2.1 MW with a Hybrid Lattice Tubular (HLT) tower at Velliyanani Phase II in Karur district and Vengaimandalam in Trichy in Tamil Nadu and the project is expected to be commissioned in March 2024. Suzlon will supply the wind turbines and supervise the execution and commissioning of the project, the company said in a stock exchange filing. ■



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Total Impurities	ppm	65.0	65.0
Oxygen	ppm	100-650	200-350
Surface Oxide	Angstrom max	1000	< 350
% Elongation	% min	30%	> 38.0%
Tensile strength	Min Mpa	200	> 210
Torsion test	10x10, 25x25	Smooth surface	Smooth surface
Conductivity @ 20o C	% IACS	100%Min	> 101

Packaging Dimensions:

Coil Net Weight	Kg Range	4050 - 4150
Coil outer diameter-OD	mm	1750
Coil inner diameter-ID	mm	900
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Seaworthy packaging	---	Yes

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Transmission line addition in Q1FY24 meets only 54 pc of target

The total quantum of transmission line addition in Q1 of FY24 was just 54 per cent of the planned addition.

According to recently released statistics by Central Electricity Authority (CEA), the country saw the addition of 2,796 ckm of transmission lines during Q1 (April to June) of FY24 that was 54.4 per cent of the planned addition of 5,138 ckm.

In its monitoring, CEA considers lines of voltage rating above and including 220kV. Sub-transmission and distribution lines are therefore outside of CEA's purview.

Here are some highlights:

- The overall transmission line addition – across all ownership groups – was quite disappointing during April and May 2023, where merely 476 ckm and 528

ckm of addition took place, respectively. It was only due to the revival in June 2023, when 1,792 ckm was added, that the Q1FY24 performance showed some respectability.

- The Central government sector (mainly accounted for by Power Grid Corporation of India Ltd), after drawing a blank in April and May 2023, added 1,361 ckm in June 2023. Thanks to this, addition in Q1 of FY24 -- also at 1,361 ckm -- actually exceeded the target of 1,238 ckm.
- State government utilities saw the addition of 1,261 ckm in Q1 of FY24, meeting around 60 per cent of the target.
- The private sector, by and large, put up a disappointing performance with just 174 ckm of actual addition against the planned 1,804 ckm. The involvement of private sector entities is mainly by way of interstate

and intrastate transmission schemes developed in the TBCB modality.

- In terms of voltage class, no 765kV line addition was seen in Q1 of FY24 even when 1,335 ckm was planned. Much of this planned addition was to come from private entities.
- As against the targeted 1896 ckm of 400kV lines in Q1 of FY24, the actual addition stood at 1,702 ckm, implying a target achievement of nearly 90 per cent. The 400kV accounted for bulk of the overall transmission line capacity addition in Q1 of FY24.
- In the 220kV voltage class – a segment dominated by state utilities – overall addition in Q1 of FY24 was 1094 ckm as against the planned 1907 ckm.
- The planned addition of transmission lines for FY24 (full year) is 16,602 ckm as against the actual addition of 14,625 ckm in FY23. ■

TRANSMISSION LINE ADDITION IN Q1 OF FY24

	Central		State		Private		Total	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Apr	142	0	916	397	96	79	1,154	476
May	1,096	0	346	528	1,165	0	2,607	528
Jun	0	1,361	834	336	543	95	1,377	1,792
Total Q1FY24	1,238	1,361	2,096	1,261	1,804	174	5,138	2,796
Target for FY24	2,654		11,010		2,938		16,602	

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With a longstanding presence of 85 years, Bajaj Electricals is widely regarded as the pioneer in India's lighting landscape. Even in the relatively new LED lighting industry, Bajaj Electricals took the lead and has made immense contribution, not just in meeting local demand but also creating domestic manufacturing competence.

In this insightful conversation, we have **Rajesh Naik, Head – Lighting Solutions, Bajaj Electricals Ltd**, speaking to **Venugopal Pillai**, on how Bajaj Electricals is leveraging its leadership in LED lighting technology to introduce value-added solutions like integrated lighting and human-centric lighting.

LED lighting technology opens a big platform for integration

Lighting is a big avenue for energy efficiency. How is Bajaj Electricals, as a pioneer in the lighting industry, is continually conscious of the energy efficiency dimension?

Bajaj Electricals has been in the lighting industry for a very long time now – in fact, since 1938. Even in the LED lighting business, we have been amongst the oldest players. We have been driving energy efficiency through LED lighting for more than 12 years now.

We tied up with an international US brand “RUUD Lighting” – regarded as pioneers in the LED lighting business. That was at a time when LED was very new to India. That gave us quick learning and the lead.

We have always been working towards bringing latest technology to the market. We had “Trilux” as our partner. That gave us the edge in creating LED solutions for different segments – mostly in the commercial segment.

What is the broad break-up of the lighting business of Bajaj Electricals, in terms of consumer segments served?

We have almost equal contribution from both professional & consumer lighting segments. We refer to residential as “consumer lighting” and everything else as professional lighting. However, if you see the overall market mix, it is reverse. Around 60 per cent is consumer lighting and 40 per



cent is professional lighting. This gives us lot of scope for growth. Due to this, we have integrated both consumer and professional lighting.

What constitutes the professional lighting segment of Bajaj Electricals?

Though Bajaj Electricals is known more for outdoor lighting, we are also present in other segments. We are known as a strong player in the Industrial segment. We are also present in other segments like commercial, architectural lighting etc. We are working to make our presence stronger in these categories through adding New Products which are relevant to segment & value added solutions. Bajaj Electricals was the only company in the lighting arena that started manufacturing high-mast poles. It was a very big decision, and gave us leverage to penetrate into the infrastructure segment.

In the industry segment, we have done illumination of most power generation plants of NTPC.

What about exports?

We are getting regular export orders for high-mast poles. Our focus is on Middle East and African markets. The ME and African markets are similar to that in India.

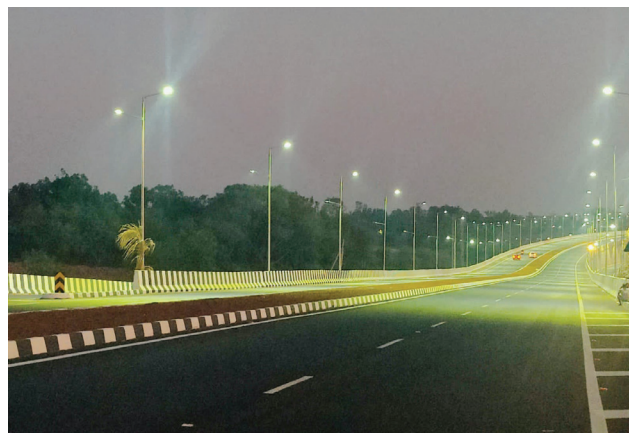
In my view, there is a big opportunity even in Europe. There are many European countries that do not have funds available for retrofitting LEDs. But if there are PPP models created for funding, the markets can be tapped. We are in talks with some banks to check if funding would be possible.

What is China's role as a competitor in the exports market?

Most of the LED chips and components for LED lighting are manufactured in China or Taiwan. They therefore have some cost advantage. But in terms of specifications, in terms of longevity of products, definitely there is preference given to Indian products.

In UAE for instance, specifications are very stringent. They were only taking products from Europe. Considering current cash position, customers from Middle East, they are looking for alternate suppliers – India or China.

They are looking at partners who can give good quality products. That is where there is a chance for the Indian industry to grow their exports.



What about competition from China products in India?

When it comes to like-to-like specification, we can easily compete with China. Thanks to EESL, that has expanded the market substantially.

Tell us about your involvement with EESL's flagship programme like UJALA and SLNP.

Bajaj Electricals has been part of EESL's UJALA programme since its launch. We got one of the initial orders released by EESL.

Then, SLNP (Street Lighting National Programme) was launched. That was originally an integrated model where the supplier quotes, installs and maintains the installation for five years. Our early order was that for South Delhi Municipal Corporation (SDMC). We are maintaining these SDMC streetlights even today.

We have sold 1.1 million street lights under SLNP. Over the last two years, around 60-70 per cent installation done by EESL (for street lights) is being done by Bajaj Electricals.

I would like to mention that EESL has now segregated the scope of suppliers under SLNP. Now there are luminaire suppliers, installers and maintenance operators.

The cost of LED has come down drastically over the years. Is there scope for further reduction?

LED technology is actually driven by the electronics. Not only are costs coming down but we are also trying to add value by adding features and improving efficiency.

LED lighting costs are coming down. If you see the CAGR



of last 2-3 years, there is not much growth. Prices are dropping quarter-on-quarter by 5-10 per cent. Therefore, even if you have to maintain zero growth, you will have to sell 30-40 per cent more in volume!

In addition to costs coming down, efficiency is also increasing. A 36W LED fixture (baten) used to deliver 3,600 lumens earlier but now it is delivering 4,200 lumens, and with reduced prices! This is a double-whammy effect!

What is the average lumen per watt now, due to increasing efficiency?

Traditionally, we had 100 lumens per watt, which went up to 120 lumens, and now we have 150 lumens per watt.

We see a plethora of players in the LED lighting business. What is your take on the matter?

In its early days, the LED lighting industry was projected to grow at a CAGR of 40 per cent. Everybody was attracted!

All offer the same products, same warranties, same performance; but at the end of the day, it is the technology that counts. Anybody can get LED drivers, do wave soldering and have a ready product to sell. However, a good brand makes the difference.

Now, the trend is to integrate many other things with the lamp. Being a semiconductor, it creates an open platform. Let us take emergency lamps with power backup. It started with LED lamps, now we are talking of emergency LED batens.

Lighting players are integrating many things in LED lighting to add value, such as sensors and even speakers, cameras, etc.

LED lighting technology actually opens a platform of what can be integrated.

We hear that LED lighting can also be used to improve human wellness. Tell us more.

Yes, Bajaj Electricals is upgrading to human-centric lighting. Basically, this is about detecting the time of the day and providing optimum lighting so as to boost human wellness and productivity.

The spectrum of light changes throughout the day. To increase the productivity of people, you should have light levels and colours changing as well. Such LED technology exists in the developed world but we, at Bajaj Electricals, have introduced it in India.

For instance, we have a product called "Eye Care" for residential lighting that reduces the harmful blue component of light.

LED technology is very much there. How one can create value by leveraging this technology is most important!

We hear of some integrated lighting solutions that Bajaj Electricals has developed.

Yes, it is about offering not just lighting, but integrated solutions. We have some homegrown solutions, which can integrate various features. For instance, we have smart poles installed in Guwahati, Assam. This integrated smart pole has a public address (PA) system, camera and

EV charger, apart from lighting. This was an initiative of local city administration.

We are now also helping the city administration to make this into a paying model, by trying to create a UPI (RuPay)-based paying system.

We are also in talks with National Highways Authority of India (NHAI) to offer similar integrated solutions.

After this LED invasion, what is the scope for conventional forms of lighting – GLS, sodium vapour, halogen, etc?

As of today, 85 per cent of lighting is LED-based. The remaining 15 per cent is there, mostly in GLS category. Sodium vapour, etc are only for replacement; no new installations are taking place. GLS is the cheapest form of lighting and is still somewhat popular. In winter season, for instance, sales of GLS bulbs tend to increase.

Do you think India's dependence on imported LED drivers is reducing?

Till around five years ago, we were mostly importing LED drivers. Now, hardly 10 per cent is imported. Everything is designed and manufactured in India. Most of the government projects insist of local production. That forced India to start manufacturing.

For Bajaj being a very strong brand. How do you see the years ahead and what would be your growth drivers?

Though there are many areas where "LED-fication" has happened, there are some sunrise segments that we think are going to grow much faster than others.

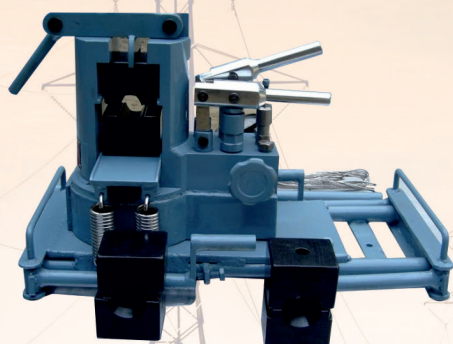
New sectors like airports, data centres. We are also closely looking at national initiatives like UDAAN, NHDP, Sagar Mala, Khelo India, etc.

Talking about Khelo India, for instance, nobody had an indigenous sports-lighting product. They were all being imported. We invested in that and got very good response from the market. The Bhubaneswar hockey stadium in Odisha where the FIH Men's Hockey World Cup 2023 was hosted was illuminated by us.. ■

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Recent Regulatory Reforms and its implications on Future Electricity Transactions

Particularly, Grid code, GNA Regulations and Transmission Sharing Regulations are the three regulations related to functioning of inter-state transmission system in the country. While the Grid Code lays down the framework for efficient and secure grid operations, the GNA regulations is related to obtaining open access in the inter-State transmission system. Similarly, the Transmission Sharing Regulations lay down the mechanism for recovery of Yearly Transmission Charges (YTC) from the designated users of the inter-State transmission system. These three regulations constitute the overall regulatory framework for the allocation and utilization of inter-State transmission system in the country.

As the transmission of electricity continues to be dependent upon the wired meshed network having natural monopoly

characteristics, the important consideration other than having a secure and reliable grid, is to develop adequate transmission capacity and ensure efficient utilization of these highly capital intensive and scarce resources. The availability and efficient utilization of the transmission system will facilitate efficient transactions between the buyers and sellers of electricity which will lead to optimal utilization of generation resources and lowering of power procurement cost having far more significance for the sector. It is in this context that the proposed regulations are important for the market and the sector.

These regulations have covered different aspects of the inter-state transmission system proposing changes in some of the earlier mechanism and introducing newer concepts keeping in view the emerging needs of the sector. The Grid code has dealt with issues viz. resource adequacy,

ancillary services and reserves, integration of renewables, unit commitment, cyber security etc. whereas the GNA Regulations has brought in a completely new approach for obtaining the access to the transmission system along with scheduling of transactions on a day ahead basis. Similarly, the Transmission Sharing Regulations has revised the methodology for recovery of transmission charges from its users. The key takeaways from these three regulations and their implications are as follows:

- Decoupling with the underlying commercial contracts: Earlier the development of the transmission system was driven by the Long-Term Access and the underlying Power Purchase Agreement (PPA) of the Discoms. In many cases when the PPA could not fructify, the beneficiaries have relinquished the LTA leading to stranded transmission assets which had to be

The Central Electricity Regulatory Commission (CERC) is in the process of framing many new regulations – such as Grid code, General Network Access (GNA) Regulations, Transmission Sharing Regulations, Renewable Energy Certificate (REC) Regulations, Ancillary Regulations, Deviation Settlement Mechanism (DSM) Regulations etc. which will have significant bearing on the functioning of the sector in the days to come, notes **Jogendra Behera**.

eventually socialized amongst all the users. As per the new GNA regulations, the development of transmission system has been decoupled with the underlying commercial contracts. It is envisaged that the development of the transmission system will take place based on the assessment of the upcoming generating stations and load centers and not based on the underlying PPAs which will rationalize the development of transmission system in the country.

- Scheduling of any contract under the GNA: GNA Regulations has proposed deemed GNA for the States based on their past demand during last 3 years. Discoms can take additional GNA as per their quantum of demand and can schedule any contract within this quantum without paying any additional transmission charges. In case there is seasonal demand, the Discoms even can opt for Temporary GNA up to a period of 11 months. Consequently, the Discoms will be incentivized to schedule their contracts including the power available in power exchanges based on marginal cost as the

transmission charges will be 'sunk cost' in nature leading to merit order dispatch of the generating stations.

- Scheduling on a Day Ahead basis: Both Draft Grid Code and GNA has brought in the concept of day ahead scheduling for all the contracts. It is proposed that all the entities will schedule their transactions on a day ahead basis regardless of the duration of contract. The transmission corridor will be allocated in the following order -- GNA, T-GNA Advance, Day Ahead Market (DAM), and T-GNA Exigency, which will then be utilized for the transactions taking place in Real Time Market (RTM) and for revisions under GNA on a first come first basis. The transmission corridor remaining unutilized after a particular step will get released for allocation in subsequent steps. For instance, the transmission corridor available after allocation to transactions under GNA and T-GNA Advance by 9:30 AM will be released for the transactions in DAM. This mechanism will ensure that if the users are not utilizing their transmission corridor as per their priority

and within the stipulated timelines, then the same can be utilized by others for meeting their requirements. This will avoid squatting on the transmission capacity and improve its utilization.

- Rationalization of Transmission charges: For quite some time the Point of Connection (PoC) mechanism was opposed, as the transmission charges levied was largely driven by the flow of electricity in the network which was beyond the control of the users. Transmission Sharing Regulations has brought a change in this methodology – transmission costs are now largely driven by Discoms GNA which is dependent on their demand. This is expected to provide more stability and transparency in the system. The transmission charges and losses will be borne by only the buyers which will bring a clarity on the applicability of charges. It will address the prevailing double charging of the transmission charges in the collective transactions wherein the generators also have to pay the transmission charges for selling power through the collective transactions. This will provide equal footing for both the collective and bilateral transactions.

The above changes are expected to bring significant improvement in the allocation and utilization of inter-State transmission system in the country. This will facilitate efficient transactions between buyers and sellers which take place on top of the meshed transmission network. The Discoms will have opportunities to reduce their overall power purchase cost including the transmission charges by considering various alternatives available in the market on a day ahead basis. They can schedule their power from the least cost sources including the DAM of the power exchanges. However, to benefit from these changes the Discoms are required to increase their market orientation and bolster their capabilities to take advantage of the situation. n

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Founded in 1886, Arthur D. Little (ADL) is the world's first management consulting firm linking strategy, innovation & transformation, in tech-intensive converging industries, ADL operates 40 offices globally and serves most of Fortune 1000 companies. In this exclusive interview, we have **Brajesh Singh, President – Arthur D. Little, India**, responding in detail to a range of questions on India's power distribution sector – the weakest link in the electricity value chain. Brajesh, whilst sharing keen insights into power distribution reforms, believes that India's journey to powering its energy sector has begun and the country shall see an aggregate single digit AT&C loss by 2030. An interview by **Venugopal Pillai**.

India should see aggregate single-digit AT&C loss by 2030

India's aggregate technical & commercial (AT&C) losses in the power distribution sector stood at 16.5 per cent in FY22, according to a recent power ministry report. Prima facie, how do you assess this number in comparison with other developing nations?

India has come a long way and as we stand at around 17 per cent AT&C, it is important to see that incredible and all-round efforts have been made in last decade. We are certainly behind from many other developing nations, but it is encouraging to see that we have some discoms who can be role models for many developing nations too. While there is no fixed benchmark for acceptable AT&C losses, the average losses in developing countries are around 10-15 per cent, with some countries achieving even lower losses. While there is no such benchmark for AT&C but a single digit number is what all utilities and discoms aspire for. We have nations in EU who have significantly low AT&C and some South East Asian nation with incredibly good AT&C. I look at these numbers with high hope because some discom like Tata Power, BSES, Torrent and Adani have already attained single digit AT&C losses in Delhi, Gandhinagar, Surat & Mumbai and it is evident that collective and concentrated approach with right blend of technology and field work can pave way for greater achievements. The ~5 per cent decline in national AT&C losses that have helped arrest ACS-ARR gap could have been possible by various initiatives taken at various levels. There are structural and policy level difference between India and other nations with better and efficient energy distribution systems. They adopted technology much before India did, the sociopolitical dynamics are different which are very important for arresting technical losses and



also economic aspects that impact commercial losses significantly. I believe India's journey to powering its energy sector has begun and we shall see an aggregate single digit AT&C loss by 2030.

AT&C losses are known to be much lower in private distribution companies, including those set up in the public-private partnership (PPP) mode, e.g. Delhi, Odisha. Do you feel that privatization of power distribution must be pursued vigorously?

See, it's all about efficiency when it comes to power distribution. Efficiencies that can only be attained by timely action on capex deployment, course correction on process like billing and collection and building very good connect with consumers. Other factors like gap between ACS-ARR, Power purchase costs and managing sociopolitical influences are equally important. While despite all the support and freedom to operate, state run discoms have been bleeding but the ones that were privatized/ under PPP could turn their operations profitable. These use cases ascertain that PPP in power distribution has been a good option. It is important to highlight that some of distribution franchisees under PPP have failed as well but if you research thoroughly and dig deeper into causes, you would find that aggressive bids for committed ABR, non-deployment of timely capex in network augmentation and strengthening distribution network.

I strongly believe that privatization of utilities is the key to success. If India aspires to attain single digit AT&C losses, it can be attained only by privatization of power distribution; not limiting to this, appropriate efforts are also required to be made on strengthening and augmenting of infra/grid and metering system to mitigate challenges related to commercial losses.

It should be noted that ever since electricity distribution was privatized in Delhi in 2002, BSES managed to save Rs.1.2 lakh crore. Despite constant surge in power demand by 2.5 times and the aggregate AT&C losses came down from 55 per cent to 7.5 per cent. Now, Delhi's AT&C losses are comparable to leading cities around the world, such as New York and London. The reduction of losses and increased investment have played a crucial role in bringing about savings for consumers in Delhi, and without these efforts, reliable power supply may have remained an unattainable goal.

Overall, the question of privatization of power distribution in India is a complex one, and any decision must be based on careful analysis and assessment of the potential



benefits and risks. The government should continue to pursue PPPs and franchise agreements, while ensuring that the interests of consumers and the broader power sector are protected.

We perceive that India hasn't been too successful with privatization, especially with respect to the distribution franchisee model. What is your take?

It is true that India's experience with privatization, particularly with respect to the distribution franchisee model, has been mixed. While there have been some successful examples, there have also been cases where franchises have failed to deliver on their promises.

One of the main challenges with the distribution franchisee model is the lack of transparency and accountability in the selection and management of franchisees. There have been instances where franchises have been awarded to companies with little or no experience in the power sector, leading to inadequate investment in infrastructure and services. In addition, there have been allegations of corruption and conflicts of interest in the selection and operation of franchises.

Moreover, there are concerns about the impact of franchises on consumers, particularly low-income households. Franchisees may focus on profitable areas, neglecting underserved and rural areas, which can lead to increased tariffs and reduced access to electricity.

Despite these challenges, there have been successful examples of the distribution franchisee model in India. For instance, the franchisee model in Bhiwandi in Maharashtra has been successful in reducing AT&C losses and improving customer service. Similarly, the franchisee model in Agra in Uttar Pradesh has improved the quality and reliability of power supply.

Overall, while the distribution franchisee model has had mixed results in India, it remains a viable option



for improving the power sector, provided that it is implemented transparently and with the interests of consumers in mind.

Do you feel that prepaid metering is the ultimate solution to restoring the financial health of state distribution companies?

Data is the key; in case of discoms, it is billing data. Knowing who is consuming and how much, is important. Consumer billing and collection of dues have always been biggest hurdle. Learning from telecom and other markets, prepaid metering was introduced in India as a tool for improving the financial health of state distribution companies and reducing electricity theft. Several states in India, including Delhi, Maharashtra, Uttar Pradesh, and Bihar, have implemented prepaid metering systems for both residential and commercial customers.

Prepaid metering enables avenue to save operating cost — the billing processes — and helps distribution companies to reduce revenue losses due to non-payment by customers. With prepaid meters, customers are liable to pay in advance for the electricity they wish to use, which reduces the risk of non-payment and improves the cash flow of distribution companies. In addition, prepaid meters can also help reduce losses due to electricity theft, as they can detect and prevent illegal connections.

However, there are several other factors that contribute to the financial health of distribution companies, such as high transmission and distribution losses, low tariff rates, and inefficient billing and collection systems. Addressing these issues requires a comprehensive approach that involves a range of measures, such as improving infrastructure and technology, reducing operational costs, and implementing effective tariff and billing policies.

In summary, while prepaid metering can be an effective tool for improving the financial health of state distribution companies, it may not be the ultimate solution on its own.

A comprehensive approach that addresses the various factors affecting the financial health of distribution companies is also required to ensure long-term sustainability and affordability of electricity services for all customers.

In this context, how important is the Revamped Distribution Sector Scheme (RDSS) that envisages the rollout of 25 crore prepaid energy meters?

Indian power sector has undergone various reforms in the past two decades and distribution remains the weakest link in the supply chain. The central government introduced several schemes that helped India achieve 100 per cent electrification in 2018. Despite stellar improvement in terms of coverage, quality and reliability of power, most of the state-owned discoms are yet to become financially sustainable.

Inefficiency led challenges have further fueled the fire and increasing debt burden have had a crippling effect on these discoms, in turn affecting the service provided by them and leaving them in cash drought and prohibited further investment in the enhancement of their infrastructure and quality of supply, especially in rural areas. Systemic issues in metering, billing, collection and network continue to affect the profitability and efficiency of discoms. While some discoms have been early adopters of reforms, information technology, and technological upgradation, others mostly state run still lag way behind, and are operating inefficiently.

Sensing that a one-size-fits-all scheme will not work for a large and diverse country like India, the government has envisaged the RDSS with a two-track system that will be governed under a uniform framework for all the states but which will also provide flexibility to include state-specific features in their action plans for prioritizing their investments.

The prepaid energy meters are a key component of the scheme and are aimed at improving the financial viability of power discoms and reducing electricity theft and losses. With the rollout of 25 crore prepaid energy meters, the Indian government aims to achieve several objectives, including:

1. Reducing AT&C (Aggregate Technical and Commercial) losses: Prepaid energy meters are expected to help reduce electricity theft and losses, which account for a significant portion of the losses incurred by discoms.
2. Improving revenue collection: The use of prepaid

energy meters will ensure that consumers pay for the electricity they consume in advance, reducing the risk of unpaid bills and improving revenue collection for discoms.

3. Promoting energy efficiency: Prepaid energy meters will help consumers to manage their electricity consumption better, encouraging them to conserve energy and promote energy efficiency.
4. Enhancing financial viability: The rollout of prepaid energy meters is expected to improve the financial viability of discoms by reducing their losses and improving revenue collection.

In conclusion, the rollout of 25 crore prepaid energy meters is an important component of the RDSS scheme in India and is aimed at improving the financial viability of discoms and promoting energy efficiency. The initial results are overwhelming and very encouraging. Discoms who have adopted RDSS, rolled out smart metering solutions have started arresting their billing and collection related issues resulting into improved performance. It is certain that data analytics will also help them overcome their challenges.

What is your view on the innovative “TOTEX” financing model that RDSS envisages? While state discoms need not incur any upfront capital expenditure, do you think developers (service providers) are reasonably assured of return on investment?

The “TOTEX” financing model envisaged by the Revamped Distribution Sector Scheme (RDSS) in India is an innovative approach that aims to promote sustainable development and improve the financial viability of power discoms.

Under the TOTEX model, discoms are not required to make any upfront capital expenditure, and the investment is made by the developer or service provider who implements the project. The cost of the project is recovered by the developer over a period of time through a performance-based contract, which incentivizes them to ensure that the project meets the agreed-upon performance parameters.

The TOTEX model is a departure from the traditional capex (capital expenditure) model, where discoms invest in infrastructure and equipment upfront and recover their costs over time through tariffs. The TOTEX model incentivizes developers to adopt cost-effective and sustainable solutions, as they are responsible for the long-term operation and maintenance of the assets they create.



In terms of return on investment, the TOTEX model provides reasonable assurance to developers or service providers, as their revenue is linked to the performance of the assets they create. The performance parameters are designed in a way that ensures that the assets are operated and maintained efficiently, which reduces the risk of breakdowns and unplanned downtime.

Moreover, the TOTEX model also provides an opportunity for developers or service providers to earn additional revenue through the sale of excess power or the implementation of energy efficiency measures. This helps to enhance the financial viability of the project and provides an additional source of revenue.

Overall, the TOTEX financing model envisaged by the RDSS is an innovative approach that can help to promote sustainable development and improve the financial viability of discoms in India. The model provides a reasonable assurance of return on investment to developers or service providers, as their revenue is linked to the performance of the assets they create.

The recent Electricity (Amendment) Bill, 2022 that will come for discussion in the upcoming Monsoon Session of Parliament envisages multiple distribution companies using the same infrastructure. What is your overall reaction to this proposal?

The proposal to allow multiple distribution companies to use the same infrastructure under the Electricity (Amendment) Bill, 2022 is an interesting one that has the potential to bring about significant benefits to the power sector in India.

One of the major challenges that Indian power sector is facing is high cost of infrastructure development and maintenance, which leads to significant capex & opex burden for discoms. Allowing multiple discoms to use

the same infrastructure can help to reduce these costs by promoting resource sharing and increasing the utilization of existing infrastructure.

Moreover, the proposal can also promote competition and encourage discoms to adopt more efficient practices, as they would be competing with other discoms for customers. This can lead to improvements in service quality and lower tariffs for consumers and may be for greater good of society, consumer and industry as this will help attaining optimum use of resources, reduce significant carbon footprints, and will lead to healthy competition.

Prima facie the idea looks advantageous but it would be good to see how unforeseen and potential challenges associated with the proposal are dealt with. For instance, there could be concerns around the equitable allocation of infrastructure resources, as some discoms may have more resources than others, which could give them an unfair advantage.

Additionally, there could be concerns around the coordination and management of multiple discoms sharing the same infrastructure. This could potentially lead to issues such as disputes over resource allocation, which could impact service quality and reliability.

In conclusion, while the proposal to allow multiple discoms to use the same infrastructure under the Electricity (Amendment) Bill, 2022 is an interesting one, it is important to carefully consider the potential benefits and challenges associated with the proposal. If implemented effectively, the proposal has the potential to bring about significant benefits to the power sector in India.

Do you feel that this Amendment Bill is a precursor to the eventual "wire" and "supply" (or "carriage" and "content") segregation that has been under discussion for quite some time now?

The Electricity (Amendment) Bill, 2022 that proposes to allow multiple distribution companies (discoms) to use the same infrastructure is not necessarily a precursor to the eventual "wire" and "supply" segregation that has been under discussion in India for some time now. The "wire" and "supply" segregation model, also known as "carriage and content" segregation, involves separating the ownership and operation of the electricity distribution network (wires) from the supply of electricity (content). Under this model, multiple

supply companies can use the same distribution network, which is owned and operated by a single entity.

While the proposed amendment bill does allow multiple discoms to use the same infrastructure, it does not involve the separation of ownership and operation of the distribution network from the supply of electricity. The amendment bill primarily focuses on improving the financial viability of discoms and promoting the adoption of renewable energy sources.

However, it is possible that the discussions around the amendment bill could pave the way for future discussions around the "wire" and "supply" segregation model. The Indian power sector has been exploring various options to improve efficiency and reduce costs, and the "wire" and "supply" segregation model has been discussed as a potential solution.

In conclusion, while the Electricity (Amendment) Bill, 2022 is not necessarily a precursor to the eventual "wire" and "supply" segregation model, it is possible that the discussions around the amendment bill could pave the way for future discussions on this topic in the Indian power sector.

If you were to suggest three broad measures that could effectively bring down India's AT&C losses, what would they be?

India's high Aggregate Technical and Commercial (AT&C) losses remain a major challenge for the power sector. There are several measures that can be taken to address this issue. Here are three broad measures that could be effective in bringing down AT&C losses:

1. Investment in infrastructure: One of the key reasons for high AT&C losses is the poor quality of infrastructure. To address this issue, significant investment is required in upgrading the transmission and distribution infrastructure. This could involve measures such as the installation of smart meters, upgrading of transformers, and laying of new transmission lines. Improved infrastructure can help to reduce technical losses and improve the reliability of the distribution network. Private sector's participation in the value chain can yield faster and better results and will improve overall efficiencies.
2. Leverage and adopt advanced technologies: Advanced technologies such as distribution automation, demand response, and predictive

maintenance can help to reduce AT&C losses. Distribution automation involves the use of sensors and automation technology to improve the efficiency of the distribution network. Demand response involves the use of advanced metering infrastructure and pricing incentives to encourage consumers to reduce their electricity usage during peak hours. Predictive maintenance involves the use of data analytics and machine learning to identify and address issues in the distribution network before they lead to outages. Measures such as improving billing and collection efficiency, reducing power theft, and reducing technical losses can help to improve the financial viability of power distribution companies. This can involve measures such as the installation of tamper-proof meters, improving the accuracy of billing, and implementing better collection processes.

3. Open access and localization of generation: Inflated Power Costs, thin margins between ACS and ABR have been key deterrents and resulted into poor financials

which ultimately leads to AT&C losses. It is time to relook at power procurement from fresh perspective as the cost of power generation has significantly come down as the energy mix is changing. Renewable power generation in India is already at a very good scale and expected to continue improving. Discoms should be given opportunity to exercise power procurement from renewable generators (also) and it is needed to relook and review age old PPAs. Localization of power generation using microgrid will also unlock values for all the players in value chain.

In conclusion, investment in infrastructure, adoption of advanced technologies, and unlocking value by localization of generation are three broad measures that can help to effectively bring down India's AT&C losses. These measures require a coordinated effort from all stakeholders in the power sector, including power distribution companies, regulators, and consumers. ■



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Distribution grids are switching to Smart Grid with modern sensors

In recent years, distribution networks have seen many new challenges in operation and demand which leads to increasing criticality of medium and low voltage grid assets. This drives the need for visibility, efficiency, and automation, while Smart Grid sensor technologies are rapidly improving solutions for distribution system operators (DSOs) to meet this need.

Over the past decades, electrical infrastructure investment has been prioritized for transmission grids due to the criticality of high voltage assets. However, in recent years, distribution networks have seen many new challenges in operation and demand which leads to increasing criticality of medium and low voltage grid assets. This drives the need for visibility, efficiency, and automation, while Smart Grid sensor technologies are rapidly improving solutions for distribution system operators (DSOs) to meet this need.

Solutions are sought to improve key performance factors such as SAIDI (System Average Interruption Duration Index), and SAIFI (System Average Interruption Frequency Index). This is accomplished by achieving quicker reaction time to locate and repair faults (SAIDI) and reducing frequency of faults with the use of data for predictive maintenance techniques (SAIFI). These indices are measured and reported with rising scrutiny in recent years, as the pressure for improved reliability is ever-increasing. Not only do enhancements of these metrics result in dependable power delivery to consumers, but they also result in reduced operating costs. Sensors can be deployed to help minimize fault durations and now even prevent faults, thus improving SAIDI, SAIFI, and maintenance expenses.

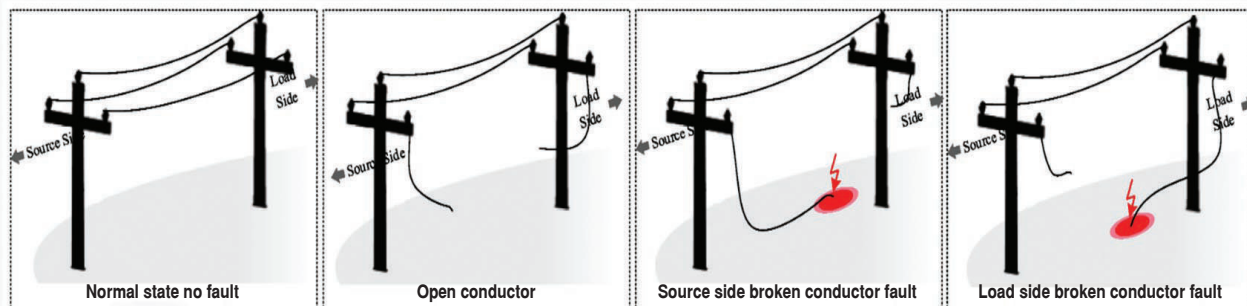
CHALLENGES FOR DISTRIBUTION COMPANY

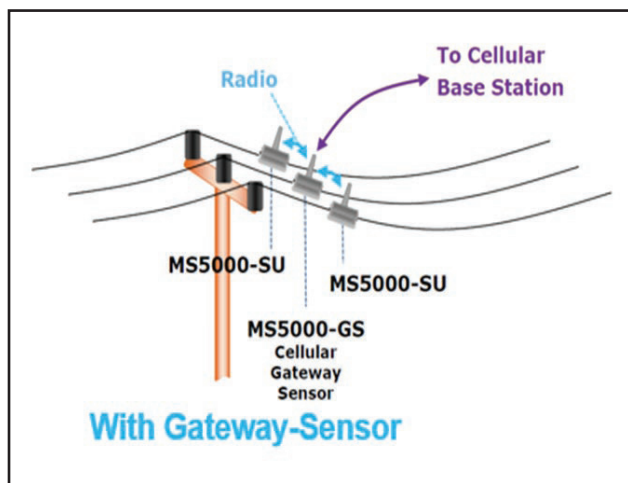
Utility distribution staff must consider efficient maintenance and the most cost-effective strategies to improve SAIDI and SAIFI and are focusing efforts on reliability on overhead distribution lines. Outages caused by faults in overhead lines are often an inevitable part of operations as these critical assets are exposed to weather, mechanical stresses, contamination, aging equipment, vegetation, and wildlife.

Many utilities invest extensive efforts in replacing overhead lines with underground cables to significantly improve reliability. There is



a correlation in relation of overhead lines in the network to SAIDI, and as such, regions with more underground cables typically enjoy better performance of their grid. However, it is not always practical to replace overhead lines with underground cables due to high costs, particularly for rural and remote areas with distribution lines covering large geographical distances. Undergrounding projects are expensive and time-consuming, requiring a large labour force commitment that is not always readily available. Therefore, overhead lines remain as a necessary means of delivering power to customers by many utilities globally and Various faults occurred in lines which are left undetected by protection system of distribution company.





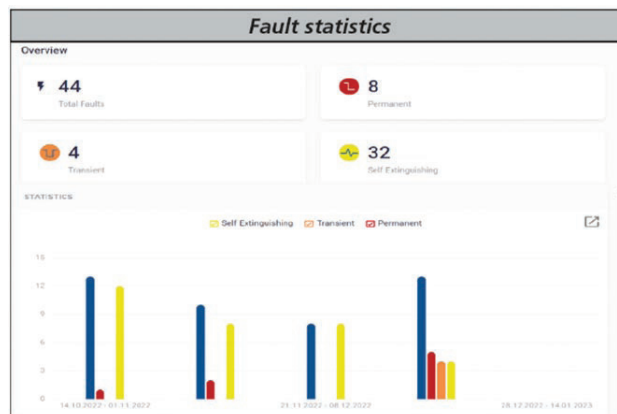
MEGGER GRID ANALYTICS – MGA

MS5000 Grid sensors can be deployed as sets of three sensors at multiple locations across power lines, providing wireless communication of precise location and fault data, even for Broken Conductor and high impedance earth faults on compensated networks.

Modern technology integrates GPS location information, meaning sensor locations and faults can be plotted directly onto a digital map, allowing technicians to navigate more easily and quickly to fault locations.

Since grid sensors now operate with better fault detection and localization capabilities due to enhanced measurement techniques and computing algorithms, why stop at fault location? With precise measurements and collection of data for trending, even transient earth faults and self-extinguished arcing events are identified. These types of faults are often not even detected by utilities or their customers but are often indicators for future outages or asset failure.

This means weak spots in the grid can be identified and analyzed over time, and this data can serve as an input into condition-based

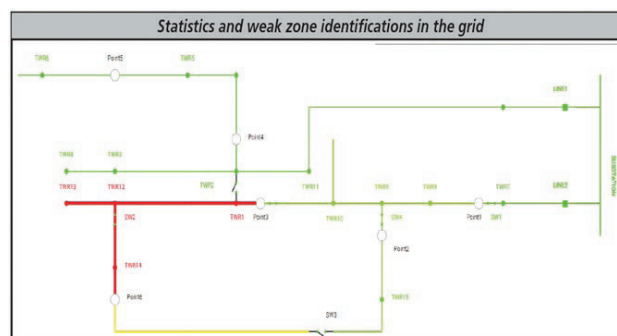


Analytics data for fault events

Fault Events 3 Months until 14.01.2023

Date and Time	Classification	Phases	Avg Current	Line
23.12.2022 19:27:37	Permanent Phase-to-Phase Fault (High Current)	A B C	357.0A	P Bagus
22.12.2022 17:56:54	Transient Ground Fault (High current)	A	0.0A	P Bagus
22.12.2022 15:01:30	Transient Ground Fault (High current)	A	0.0A	P Bagus
22.12.2022 15:00:06	Transient Ground Fault (High current)	B	0.0A	P Bagus
22.12.2022 14:52:14	Transient Ground Fault (High current)	A	0.0A	P Bagus
18.12.2022 12:05:58	Permanent Ground Fault (High Current)	A B C	304.0A	P Bagus
18.12.2022 00:53:38	Permanent Phase-to-Phase Fault (High Current)	A B C	1096.0A	P Bagus
17.11.2022 15:17:15	Permanent Phase-to-Phase Fault (High Current)	A B C	704.0A	P Bagus

Phase to Earth Permanent 304A



maintenance strategies to prevent permanent faults and outages, thus reducing SAIFI.

Additionally, vegetation growth and encroachment can be identified by MS5000 sensor, so that growth management can be conducted before catastrophic events such as wildfires occur. Power quality parameters, such as harmonics, can be measured to identify extra stresses on the grid, for example from renewable resources. This means that grid sensors are transitioning away from simple FPIs and are now able to additionally serve as local power quality monitors with data such as Fault statistics, analytics data, and weak zone identification in the Grid that can be used for predictive grid analytics.

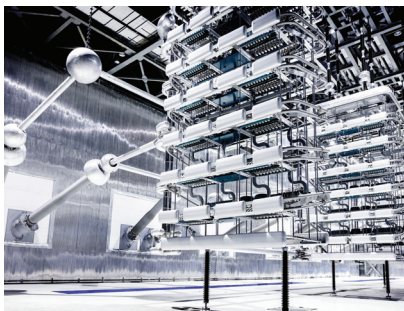
Adani Energy bankrolls \$1-billion Mumbai HVDC link project

Adani Energy Solutions Ltd (AESL), formerly Adani Transmission Ltd, has announced successful financial closure for its \$1-billion Mumbai HVDC link project

This project, on which construction work is expected to start in October 2023, will enable further 'greening' of the Mumbai Grid by supplying more renewable power to the city while supporting its rising electricity demand.

The credit facility is part of the \$700-million revolving project finance facility tied up in October 2021 for its under-construction transmission assets portfolio. This unique Platform Infrastructure Financing Framework that funds various under-construction assets offers project access to funds that another project in the portfolio has paid back. Such an effective one-time structure ensures continuous and consistent access to capital for all future projects in AESL's transmission portfolio, a release from AESL said.

Mumbai's electricity demand is expected to touch 5,000 mw by FY25 from the current peak demand of 4,000 mw. The island city has only 1,800 mw of embedded generation capacity and the existing transmission corridors face capacity constraint risks.



On October 12, 2020, the entire city witnessed a major power blackout event due to the grid constraints. The HVDC transmission link will enhance grid stability by providing an interface with the state and national grids. The link shall bulk-inject an additional 1,000 mw of renewable power into the city, thus ensuring uninterrupted power supply in future.

Incidentally, Adani Electricity Mumbai Ltd (AEML), the largest electricity distribution company, has committed to increasing the share of renewable energy in the overall mix to 60 per cent by 2027.

Use of HVDC: The HVDC transmission technology is superior to other conventional technologies as it stabilizes power distribution networks where sudden new loads or blackouts in one part of the network

may lead to synchronization problems and cascading failures. Besides, it is the only technology suitable for islands where submarine cables are used for procuring power supply. More importantly, it is the most environment friendly option as it transmits more energy per square meter as well as results in lower energy losses. Adani Energy Solutions is the only private player with experience of installing HVDC transmission lines in India and in record time.

The 80-km multi-faceted project will offer a technological upgrade to the city while managing all the complexities in developing such a large scale project in a city like Mumbai.

RTM project: According to information available with T&D India but not contained in the present AESL release, the Mumbai HVDC project is an intrastate project and is being implemented on regulated tariff mechanism (RTM) basis through a project special purpose vehicle "Adani Electricity Mumbai Infra Ltd," a wholly-owned subsidiary of Adani Energy Solutions Ltd (AESL). The 80-km HVDC link has an underground component of 50 km, and the order for building this link has been placed on Hitachi Energy India Ltd. ■

HPX gets CERC nod for High Price Contracts

Genus Power Infrastructures Ltd has teamed up with an affiliate of Singapore-based investment firm GIC to set up a platform to fund smart metering projects.

Hindustan Power Exchange Ltd (HPX) has got approval from the Central Electricity Regulatory Commission (CERC) for the introduction of high price contracts. In a release, HPX said that CERC approval for high-price contracts is applicable in three key markets - High Price Day Ahead Market (HP-DAM), High Price Term Ahead Market (HP-TAM), and High Price Contingency Contracts.

As a part of this development, HPX will now offer

these contracts in the High Price Day Ahead Market and High Price Term Ahead Market segments. The move comes as a part of the Commission's efforts to further enhance market dynamics, deepen the market, and provide more opportunities for members to manage their risk and optimize their energy portfolios. The High Price Contingency Contracts will provide added stability to the energy market during periods of volatility, the HPX release said.

The HP-DAM pricing has been established with a floor price of zero to mitigate any adverse impact on

the integration of renewable energy in the national grid. Simultaneously, the forbearance price has been set at Rs.20 per kwh as per the Commission's suo moto order dated March 31, 2023 in Petition 4/SM/2023.

With the fresh alternative of HP-TAM these high price generators can plan for sale of their power to interested beneficiaries under longer term contracts of up to 90 days. This would give them an opportunity to secure fuel supply in advance and plan their operations basis the underlying contracts, moving away from the sole dependency on clearance in the DAM segment. ■

Genus Power incorporates SPVs for AMISP projects

Genus Power & Infrastructures Ltd has incorporated special purpose vehicles for implementation of AMISP projects.

In a stock exchange filing, Genus Power & Infrastructures Ltd said that it has incorporated a wholly-owned subsidiary “Genus Mizoram SPV Pvt Ltd” on July 26, 2023. This SPV has been formed for execution of an AMISP (advanced metering infrastructure service provider) contract.

It may be recalled that in March 2023, Genus incorporated a similar SPV “Genus Tripura SPV Pvt Ltd”, also for execution of AMISP contracts.

On July 19, 2023, “Genus Chhattisgarh PKG 1 SPV Pvt Ltd” was incorporated as a wholly-owned subsidiary of “Hi-Print Energy Solutions Pvt Ltd,” in turn a wholly-owned subsidiary of Genus Power Infrastructures Ltd.

RDSS MANDATES

In recent months, Genus has been winning a series of AMISP mandates under the Revamped Distribution Sector Scheme (RDSS). In early July 2023, Genus reported the winning of a letter of award worth over Rs.2,200 crore for an AMISP project. However, no details of the entity placing the award were provided. Another award, worth nearly Rs.3,000 crore, was announced in January 2023, once again with no details.

From the formation of the aforementioned SPVs, it may be surmised that Genus Power has won AMISP mandates under RDSS in Tripura, Mizoram and Chhattisgarh, among other locations like Bihar.

It is learnt that the order backlog of Genus Power currently stands in excess of Rs.6,000 crore.

INVESTMENT PLATFORM

It may be recalled that in early July this year, Genus Power teamed up with Singapore-based GIC to form an investment platform

of \$2 billion for undertaking AMISP projects. GIC would be the larger investor in the platform with 74 per cent equity stake with Genus holding the remaining 26 per cent.

The \$2-billion platform will have a mix of equity and debt. The investment by Genus for 26 per cent equity stake would be around \$211 million.

Here is how the investment platform will work:

- The platform (and not Genus Power) would be the entity bidding for AMISP concessions
- Genus Power will be the exclusive technical partner — supplier of meters and services — to the platform for AMISP projects won by the platform
- Around 60 per cent of the project value won by the platform is expected to accrue to Genus Power and the remaining 40 per cent to the platform
- All AMISP projects currently with Genus Power (except for Rs.1,000 crore of projects in Bihar that were awarded in 2022) will be transferred to the platform. The total value of AMISP projects to be transferred to the AMISP would be in the region of Rs.5,000 crore
- The platform has targeted installation of 30 million smart meters over the next 3-4 years, which translates to order volume of around Rs.30,000 crore
- The various project SPVs formed (such as those discussed above — Mizoram, Tripura and Chhattisgarh) will receive funding from the platform. Genus will receive business from the SPVs, while the SPVs will be billing the utilities (entities placing the AMISP

orders)

- Currently, all the SPVs are wholly-owned subsidiaries (or step-down subsidiaries) of Genus Power. However, given the way the investment platform is going to work, it is likely that there would be some ownership restructuring of these SPVs. ■

Arunachal Pradesh gets its first GIS substation



A new gas-insulated switchgear (GIS) substation was recently commissioned in Arunachal Pradesh — the first such for the northeastern state.

On August 2, 2023, a 132/33kV GIS substation located at Nirjuli, a town in Papum Pare district, was inaugurated at the hands of Chowna PSUs, Deputy Chief Minister of Arunachal Pradesh.

Commissioned by Power Grid Corporation of India Ltd (PGCIL), this substation has capacity of around 100 MVA, reports suggest.

PGCIL is also believed to oversee the construction of over 2,000 km of transmission and sub-transmission lines, aimed to reduce Arunachal Pradesh's transmission losses.

It is also learnt that the Arunachal Pradesh has signed agreements with Central PSUs envisaging investment of around Rs.1,30,000 crore in the state's hydropower sector. ■

APTEL stays MERC's tariff schedule for Tata Power for FY24

The Appellate Tribunal for Electricity (APTEL), on July 14, 2023, passed an order granting interim relief sought by Tata Power by staying the Maharashtra State Electricity Regulatory Commission's (MERC) revised tariff schedule on MTR framework.

Customers of Tata Power in Mumbai will get the benefit of this order as the company will be able to pass on the relief to its 7.5 lakh consumers.

Tata Power had approached APTEL seeking an interim stay on the tariff order, dated March 30, 2023, issued by MERC. The said tariff order would have increased the price paid by consumers despite Tata Power maintaining a competitive average cost of supply.

As already reported by T&D India on June 7, 2023, the MERC tariff order for FY24 had fixed tariff for 22 categories of Tata Power's Mumbai distribution business (referred to as TPC-D), tariff is lower than that of Adani Electricity Mumbai Ltd, in just three tariff categories. Two of these three categories are of the "low consumption" type. However, tariff has been set significantly higher in the case of C&I (commercial & industrial) consumers, which account for the bulk of the revenues from the electricity business.

In the interim period, the tariff proposed by Tata Power to MERC on March 31, 2020, becomes applicable once again. This tariff is 25-35 per cent lower than the existing one and will be for the benefit of the consumers. ■



MPPTCL energizes power transformer at Barhi substation

Madhya Pradesh Power Transmission Company Ltd (MPPTCL) has energized a new power transformer at its Barhi substation.

In a release, MPPTCL said that a new power transformer of 50 MVA capacity has been energized at the 132kV Barhi substation in Katni district.

This transformer, commissioned at a cost of around Rs.6.40 crore, has strengthened the power transmission capacity of Katni district. With the result, about 63,300 agricultural and domestic consumers of 110 villages, including various industrial units of Amarpur and Bharewa in the adjoining Umaria district, MPPTCL said.

Electricity is supplied from the 132kV Barhi substation to urban areas of Katni district, as well as rural areas of the district like Gaurtalai, Kua, Khitauli and Pipariya. Rural areas like Amarpur and Bharewa in the Umaria district are also served by the Barhi substation.

MPPTCL supplies electricity from the 132kV Barhi substation through four feeders of 33kV. With the installation of this new 50 MVA transformer, the transformation capacity of Barhi substation has increased to 90 MVA, and that of the entire Katni district to 1,653 MVA.

In Katni district, the MP transmission utility transmits electricity through its one 400/220kV substation at Katni and five 132kV substations, located at Katni, Barhi, Kaymore, Dhimarkheda and Sleemanabad. ■

Adani Electricity exposes major power theft case in Mumbai

Adani Electricity Mumbai Ltd (AEML), in a release, said that its vigilance team has unearthed a major power theft case in a Mumbai suburb.

AEML said that the case, involving Rs.1.09 crore worth of power theft, was made against one Crohast Plastic Moulding Mfg. Ltd, running a plastic moulding business at Andheri (East), in suburban Mumbai. The power utility has booked direct supply case under Section 135 of Electricity Act 2003.

The AEML vigilance team noticed suspicious activities against Crohast Plastic Moulding Mfg Ltd but were not able to gather proof. This time, with proper planning, the team raided the site on July 13, 2023 and cracked a case of "direct supply", where three-phase direct supply connection was taken from source and extended in Crohast Plastic Moulding up to a changeover switch.

The consumer was using changeover switch to divert meter supply to direct supply and vice versa. Direct supply was being taken for load of 58kW. During the raid the team faced numerous obstacles including attempts to obstruct and manhandling of team members. Despite their resistance, the team managed to gather evidence and book the case under Section 135 of Electricity Act 2003.

The assessment was done for 5,61,598 units (kwh) for a period of four years and seven months for around Rs.1.09 crore. ■



MECO DIGITAL MULTI-RANGE PORTABLE METER

MECO Digital Multi-Range Portable Meters are ideal for continuous AC TRMS and DC measurements. These precision meters are of Class 0.5 and have a backlight display with annunciators for ease of reading.

The meters can be used in horizontal, vertical or inclined position and there are NO parallax errors. These are housed in a strong, compact and rugged casing with a tilt handle for ease of carrying. These are designed using advanced microcontrollers and SMT technology and there are no moving parts which could cause loss of accuracy or errors.

There are 4 models, one each for A AC, A DC, V AC and V DC. Each model has 5 ranges thereby eliminating the need for having separate instrument for each range. There is overload indication and overload protection against accidental misuse. USB connectivity and user interface software is provided for ease of data handling and analysis.

These Digital Multi-Range Portable Meters are most suitable for use in Laboratories, Engineering Schools/ Colleges Workshops and Field Measurements Applications for continuous use and can serve as a master standard meter for verification or re-calibration of secondary standard meters.

Features

- ✓ Precision Class 0.5
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- ✓ Backlight Display with Annunciators (No Parallax Errors)
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- ✓ Overload Indication
- ✓ Strong Rugged Casing with Tilt Stand.



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Madhya Pradesh Power Transmission Company Ltd (MPPTCL) has installed a new 63 MVA transformer at the 132kV Shahganj substation in Sehore district, taking the total transformation capacity of the substation to 103 MVA. This enhanced capacity will benefit consumers of Shahganj, Dobi, Nander, Amon, Digwad areas in Sehore district. The new transformer was energized remotely using from the Bhopal SCADA Centre, 70 km away from the installation site, a release from MPPTCL said.

Kalpataru Projects International Ltd (KPIL), on July 10, 2023, acquired the remaining 49 per cent equity stake in Fasttel Engenharia S.A., Brazil ('Fasttel'), making it a wholly-owned subsidiary of Kalpataru Power Do Brasil Participações Ltda, in turn a wholly-owned Brazil-based subsidiary of KPIL. Kalpataru had completed 51 per cent equity stake acquisition in Fasttel in April 2021.

Inox Wind has announced that TUV SUD has granted a Type Certificate for Inox Wind's new generation 3-mw wind turbine with a booster capacity of up to 3.3 mw. This certification signifies that the prototype turbine has successfully met the necessary requirements for serial production and commissioning. TUV SUD's certification process included rigorous testing and verification in accordance with the internationally recognized standard, IEC 61400-22, and the Type Certificate issued is valid worldwide. Inox Wind's 3 mw turbine, developed with globally renowned AMSC as the technology partner, features a 100m tubular tower and 145m rotor diameter.

Power Finance Corporation (PFC) has filed tranche I prospectus dated July 17, 2023 for public issue of secured, rated, listed, redeemable, non-convertible debentures of the face value of Rs.1,000 each. The base issue size is

Rs.500 crore with a greenshoe option of up to Rs.4,500 crore, aggregating up to Rs.5,000 crore, which is within the shelf limit of Rs.10,000 crore. The Tranche I Issue opens on Friday, July 21, 2023, and closes on Friday, July 28, 2023 with an option of early closure or extension in compliance.

WIKA India recently inaugurated its Force Measurement Production Unit in Pune. The new unit will play a pivotal role in future technological advancement in WIKA's products, a company release said, adding that this unit brings together the company's expertise to create customized force measurement solutions for the industry. The unit is a major step in the company's mission to bring high-quality products to the market in the shortest possible time, the release added.

Torrent Power Ltd has forayed into electric mobility infrastructure with the launch of four new EV charging stations – all in Ahmedabad, Gujarat. To EV charging stations will soon be launch in Surat followed by more cities. Torrent Power is developing its EV charging stations network in collaboration with Siemens.

Serentica Renewables has signed a first-of-its-kind standalone energy storage capacity offtake contract with Greenko Group. As part of this contract, Serentica will leverage Greenko's unique energy storage capabilities to utilise a cumulative 1,500 MWhr capacity from its upcoming energy storage projects in Andhra Pradesh and Madhya Pradesh, a release from Serentica Renewables. This deal will augment Serentica's efforts to deliver round-the-clock, firm, and dispatchable renewable energy to its industrial customers with an annual assurance of >95 per cent and a 15-min time-block assurance of >85 per cent, the release added.

Adani Transmission Ltd (ATL) has won the 'Golden Peacock Environment Management Award (GPEMA)' in the 'Power Transmission' sector from 'Institute of Directors (IOD)'. ATL was adjudged 'winner' for its unique strategic initiative to increase renewable energy in bulk power procurement for distribution in Mumbai region by its B2C arm — Adani Electricity Mumbai Ltd (AEML). The award is an encouraging recognition of ATL's long-term environment-social-governance (ESG) commitment, the company said in a release.

Avaada Energy has won the a MWp project under tariff based competitive bidding carried out by SECI as a part of SECI's 2 GW ISTS-connected Solar Projects (Tranche XI). Bidding allows flexibility to Avaada Energy to set up

the Solar Power project anywhere in India and supply green electricity on long-term at a tariff of Rs.2.61 per kwh. Project will become operational within 18 months from the signing of the PPA.

APPOINTMENTS

CG Industrial Power & Industrial Solutions Ltd (CG), in a stock exchange notification, said that Ajay Jain has been appointed as Vice President, Transformer Business, of the company and will be heading the CG's transformer business. A Bachelor of Engineering in Electrical and Power Systems from Punjabi University, Jain has 28 years of experience in the transformer business and has worked with organizations such as Hitachi Energy, GE, Alstom, and ABB, the notification said.

Zetwerk Manufacturing Businesses has announced the appointment of Pulkit Bhandari as the company's Chief Financial Officer. In his role as CFO, Pulkit Bhandari will be responsible for collaborating closely with the founders on strategy. He will anchor Zetwerk's initiatives around financial planning and capital allocation. Pulkit will work with existing teams to strengthen the company's financial frameworks and reorient some of the structures to make Zetwerk ready for future growth. He will also work closely with investors and drive external stakeholder engagements, a release from Zetwerk said.

POWER GENERATION

The Arunachal Pradesh government has allotted five hydropower projects in the Dibang basin to **SJVN Ltd**. The projects, with aggregate capacity of over 5,000 mw are: Etalin (3097 mw), Attunli (680 mw), Emini (500 mw), Amulin (420 mw) and Mihumdon (400 mw). Etalin and Attunli were earlier allotted to private players but lack of physical progress inspired their transfer to SJVN. The state government has also allotted hydropower projects to other Central PSUs like Neepco, NHPC and THDC India.

Bharat Heavy Electricals Ltd (BHEL) has successfully synchronized of the 660 mw Unit-2 of the 1,320-mw Maitree Super Thermal Power Project (STPP) in Bangladesh. The 2x660 Maitree STPP is located at Rampal, Mongla, Bagerhat, Bangladesh, and is being set up by BHEL for the Bangladesh-India Friendship Power Company (BIFPCL), which is a 50:50 joint venture between the Bangladesh Power Development Board (BPDB) and NTPC.

SJVN Ltd has inked an MoU with Sikkim Urja Ltd (SUL) for power trading. In terms of the MoU, SJVN shall trade 180 mw hydropower from SUL's 1,200-mw Teesta-III hydropower project in Sikkim to distribution licensees and OA consumers. This will be SJVN's first venture Sikkim, SJVN said in a release. It may be mentioned that CERC has granted SJVN Category- I Power Trading License for interstate trading of electricity.

MOUS FOR PROJECT FINANCE

Avaada Group has entered into an MoU with REC Ltd that envisages assistance of up to Rs.20,000 crore by REC in Avaada's diverse energy transition ventures. In the upcoming five years, Avaada has planned significant investment into areas like green hydrogen and its derivatives, solar photovoltaic (PV) manufacturing, and an assortment of solar, wind, and hybrid projects. For over a decade, REC has extended steadfast support to Avaada, either directly or via the KfW and World Bank line, a release from Avaada Group said.

ReNew Energy Global Plc has signed MoUs worth Rs.64,000 crore with Power Finance Corporation (PFC) and Rural Electrification Corporation (REC) for its green energy projects. Accordingly, ReNew will receive Rs.32,000 each from PFC and REC for financing its current and upcoming energy transition projects. The company will utilize the funds for new projects including solar, wind, hybrid, energy storage, solar modules and cell manufacturing, and green hydrogen, ReNew said in a release.

SJVN Ltd has informed the signing of an MoU with REC wherein the latter will finance projects of SJVN and its subsidiaries/JVs, to the extent of Rs. 50,000 crore. REC will provide financial assistance to set up new power generating stations based on conventional & renewable sources of energy. REC will also assist financially in setting up new technology projects like battery storage, e-vehicles, green hydrogen/ammonia, hydrogen cells storage, manufacturing units for green projects. The MoU also covers the transmission component of these projects.

Juniper Green Energy has signed an MoU for Rs.5,000 crore with Power Finance Corporation Ltd (PFC) for funding its upcoming 1,200 mw of renewable energy projects. Juniper Green Energy has an existing portfolio of about 800 mw including 435 mw under construction. The company's development portfolio is over 3,000 mw comprising solar, wind and hybrid projects, currently under various stages. ■

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85% of disruptive incidents are caused by partial discharge

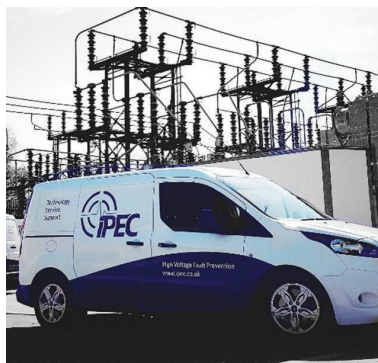
By Sai J Mynampati, General Manager/Sr. PM, IPEC Ltd, UK

IPEC has revolutionized the way Engineers, Asset Managers and Technicians can monitor electrical assets for any Partial discharge activity using most advanced Partial Discharge detector in the market. This is the most demanded tool by O&M that helps to detect failure of insulation in early stages and avoid catastrophic failures.

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ABOUT IPEC

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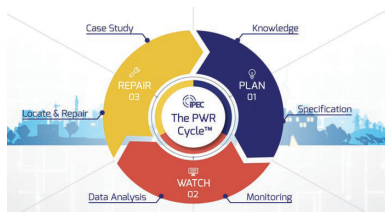
ABOUT AUTHOR

Sai J Mynampati has a bachelor's degree in electrical and Electronics Engineering, Masters in Power Systems and MBA in Operations and Supply chain management. Sai has over 13 years of experience in Electrical industry as a High Voltage Field Service Engineer, Project Manager, Contracts Manager, Supply Chain Manager and Business System leader with leading CBM Manufacturing Industries

Sai is a highly skilled PD expert with extensive experience in strategic planning, project management, operations management, and customer support. Sai is working as General Manager / Sr Project Manager in IPEC and responsible for Business development in India, Project Execution and Contract management of PD monitoring projects of IPEC.

large color touch screen makes analysis clear and simple and data storage with integrated software give a clear picture of asset health over time. The PD Detector Pro features advanced noise rejection algorithms to effectively filter out background electrical noise, displaying both PD and Noise level for the user.

IPEC also offers continuous Partial discharge monitors for all utilities where key assets can be monitored 24/7 using IPEC most advanced sensors. IPEC can monitor Switchgear Air/ Metal / Gas insulated, cables, Rotating machines and Transformers. Continuous monitoring systems has very high sampling rate which is 100M samples / Sec at 14-bit resolution with fully automated noise rejection analysis. These systems can be monitored remotely and PD alerts are received via Email/SMS and data can be analysed using IPEC software.



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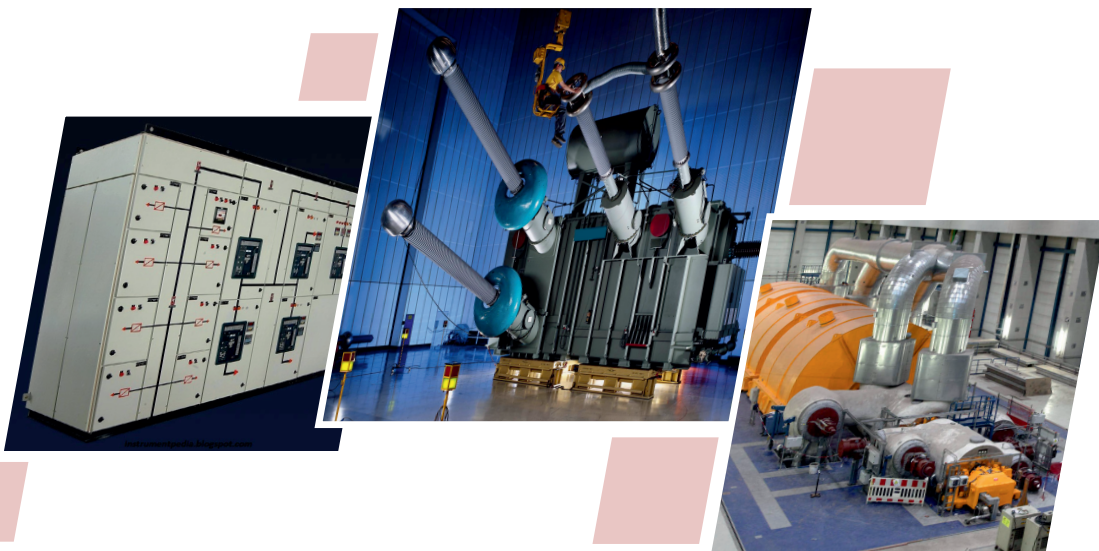
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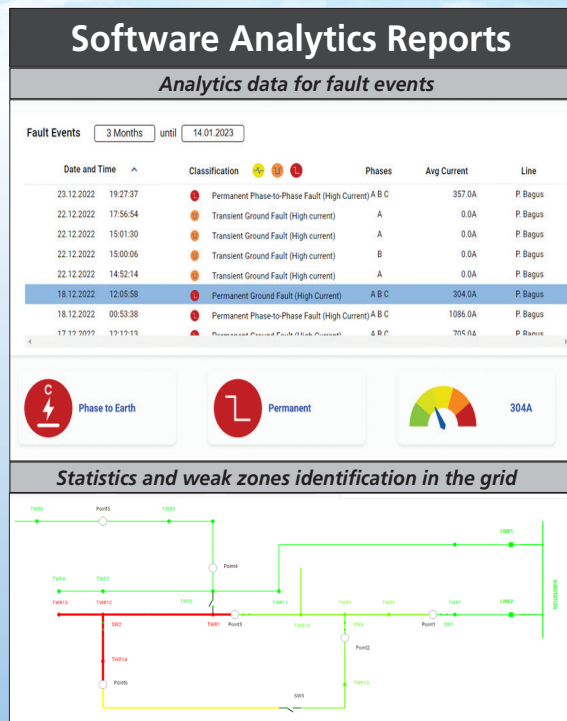


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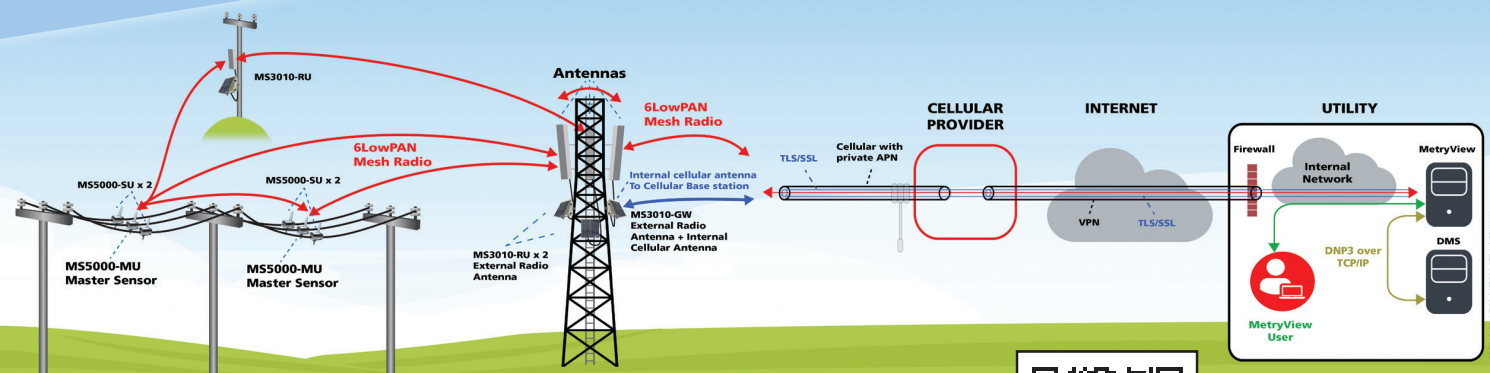
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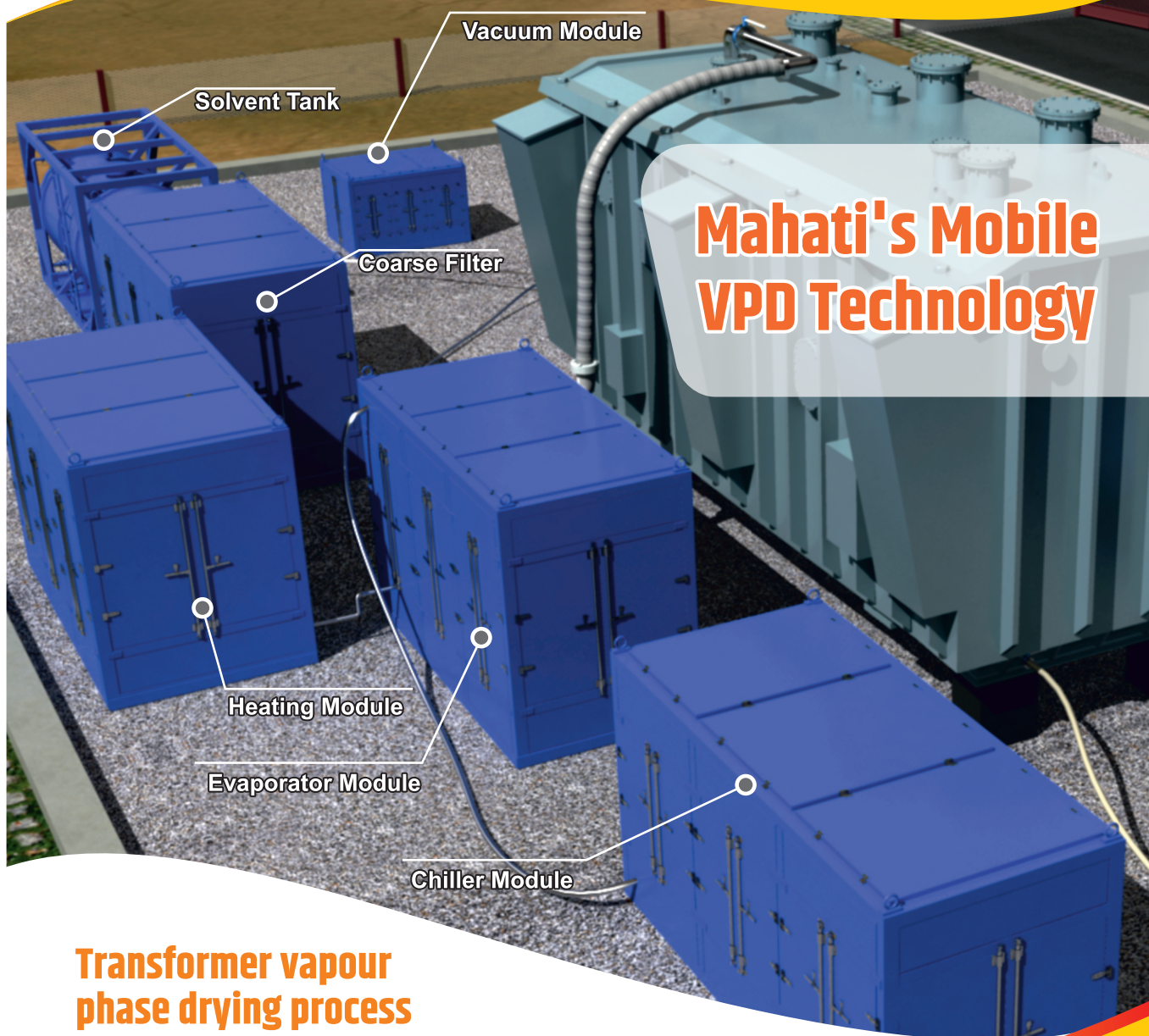
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