INDIA NEEDS ‘SMART’ STEPS TO REDUCE DISTRIBUTION LOSS

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India needs ‘smart’ steps to reduce distribution loss

Distribution network in India is mostly loss making due to poor monitoring of distribution lines. It is essential that India builds a reliable network through perfect distribution network planning, right installation practices and the use of high-quality productivity.

Distribution loss: a big challenge
India’s power sector reforms in 2013 would be led by the distribution segment, armed with the newly announced debt-restructuring package for state utilities. The Union Budget has tried to address power distribution the major chunk in the power sector. India, which has an installed power generation capacity of over 2,00,000 MW, expects to add about 88,000 MW in the current Five-Year Plan ending March 2017.

Whereas Rajat Bhaduri, General Manager and Head - Utilities Metals and Earth Resources Vertical, Wipro Infotech, said, “While the official figures say otherwise, the energy deficit is around 30 per cent. With the growing demand, the requirement per year may be around 10,000 MW. However, the shortfall may not and is not merely a supply problem. It is largely due to heavy losses in the distribution sector, and the management of load and demand. Investment around RAPDRP, both in IT and SCADA, is supposed to address a part of the loss problem and also have some system in place to extract data from the field. Having
said that, the bigger problem of load and demand management should be addressed by, what the world believes is a smart grid.”

Distribution losses in European nations or countries like Finland are as little as 3-4 per cent, and in India it can be up to 50 per cent. This is a unique contrast as the distribution networks in India are often marred into a number of bottlenecks and are mostly loss making due to poor monitoring of distribution lines. In such scenarios, it is essential to minimise general losses and theft by building a reliable network through perfect distribution network planning, right installation practices and further by the use of high-quality products, e.g., cable accessories and connectors.

Ashok Kaushik, Managing Director, Ensto India, said, “Today still over 30 per cent of electricity generated in India is lost in transmission and distribution. Automation techniques can be employed to reduce this loss to its minimum. After understanding the need for automation in the power sector, the government has in the union budget of 2013, set down a plan for creating and harnessing alternative sources of power using automation. Yet, automation must be rightly implemented in this sector if India has to achieve its goals to its fullest potential.”

**Automation in power sector**

Adoption of advanced automation technologies can enhance the performance of entire distribution network while reducing the losses. Speaking about the Indian power sector’s current position in terms of leveraging cutting-edge automation technologies, Mr Kaushik said, “India has never been the best when it comes to implementation of automation technologies in many occasions. The government needs to set up the right policies and create the necessary awareness so that entrepreneurs are interested in adopting new technologies from other countries and will invest in India. The automation system needs to focus more on customer benefits and educate the people about latest possible ways to implement the automation technology in power sector.”

On the other hand Mr Bhaduri said, “If we focus just on the distribution sector, automation is scarce and spread rather unevenly across. It is no rocket science to appreciate that optimal utilisation needs to be enabled through quality automation evenly spread. An example is that if demand information does not come through automation, then the supply demand relationship cannot be aggregated and acted upon. Also there is a need for standardisation in automation. To summarise the big challenge, we should be able to optimise utilisation through quality automation as a base requirement. This is the foundation for a smart grid implementation.”

**Penetration of automation in power sector**

According to Mr Bhaduri, the penetration of automation technology in Indian power sector is very low and scarce and unevenly spread. However, talking on this aspect Mr Kaushik said, “As the volume of production goes up and the drive for higher cost efficiency continues, one can anticipate that the gap in automation will be bridged in the coming year. Automation is now being directed toward creating a smart grid, a technology popular in the west. Among others, the power ministry is looking at a system where the transmission lines can be controlled from a distance. The ministry is looking to come up with a system where one can look at switching off the power of an area without a lineman being physically present there.”

He added, “The country is also looking at higher electricity generation from the renewable energy sectors like solar, wind and hydro. However, the sources do not generate electricity in a continuous manner like coal-based or gas-based power generation. Blending electricity generated from renewable sources with the main source of power from coal-based power plants in the grid is a troublesome process. The ministry seeks high-end technology to solve these issues.”

**Initiatives to encourage automation**

Ensto develops and manufactures accessories for the construction of reliable electricity distribution networks, for both overhead lines and underground cables. Moreover, its assortment comprises devices that improve the quality of electricity and enable fast recovery in the event of a fault. The solutions are focused on safety and sustainability in the distribution of electricity.

Describing his company’s initiatives Mr Kaushik said, “Ensto’s solutions improve electricity quality. We invest in high-quality products that enable building reliable electricity distribution networks. The smart grid should ensure that everything runs smoothly regardless of rapid fluctuations in production and consumption. Our solutions enable high-quality electricity for all customers in the distribution network, regardless of consumption and reducing losses.”

Mr Bhaduri of Wipro feels that the problem of lack of automation in power sector cannot be addressed by his company alone. He said, “We along with our partners are trying to address this problem jointly, either participating through RFPs or through pilot projects generated by the nodal agencies as well as states. While the partners help create the desired level of quality automation, Wipro works closely with them on the performance operation framework - identify system and process bottlenecks and improvement opportunities and help plug the gaps through quality software implementation and services around it. Our customers are also working along with us, as they believe that such initiatives will help them.
in their standardisation drive and thereafter transform them.”

**Opportunities for smart grids**

Traditionally, grid was about engineering making enough power flow safely through the system. But today, we need extremely enhanced management and control mechanism which is coined as ‘smart grid’. Smart grid uses advanced bi-directional communication and control (connect/disconnect) facilities, which enable us to know in almost real-time where the power is going. It can transform the grid to be more efficient, robust, agile, and renewable friendly. What the smart grids can deliver is driven by need.

According to Mr Bhaduri, “We feel that smart grid is not a luxury in India; it is a necessity. This is applicable not only for India but across all developing countries. It is important to note that, in India we still have around 40 per cent of our population which does not have access to electricity, and smart grid will make a real difference. The smart grid ecosystem of technologies helps in drastically improving the supply demand imbalance and brings in optimised, efficient use of energy in the distribution network.”

The other most important area which remains unexplored or drawing little attention is the integration of renewable energy generated (solar and wind mainly), no matter how small they may be in terms of capacity in either the mainstream, or through micro grids. This will certainly address the energy shortage problem,” Mr Bhaduri continued.

Mr Kaushik added, “In the US and Europe, factors like labour costs, renewable energy sources and electric vehicles are the growth drivers for smart grid whereas load management, especially during the peak hours will be a major driver in India. Considering that electricity cannot easily be stored in large scale, one has to either increase supply or reduce demand.”

**Barriers for smart grids**

The industry faces many challenges like paucity funding and availability of human resource with good experience in the sector. According to Mr Kaushik, “The problem of loss is intensified as no one even knows how the patterns of loss break down. In India, utilities are not required to report detailed loss percentages, and everything from transmission and distribution loss to antiquated stealing is aggregated together into the ATC figure. It definitely seems like a logical starting point to use information technology that would allow the utilities to measure loss and be able to manage it better. At the same time a more granular view of what is happening on the grid is surely needed.”

Mr Bhaduri said, “Change in mindset is very important which is being addressed by the pilot projects taken up nodal agencies. These projects, once implemented will showcase the ability of a smart grid ecosystem. Funding is also challenge. The utility sector in India is not profitable and thus completely depends on the government funding which, if it comes, is most of the time, used to offset the huge losses.”

He further added, “There is a need for consultants, people with prior experience and enriched ideas on the ground level scenario in India. IT companies like Wipro and automation companies constantly add value in drawing an overall master plan for the smart grid implementation in India.”

**Need to minimise losses and thefts**

Highlighting the status of his company, Mr Kaushik emphasised, “By providing an appropriate means of distribution and optimum power supply, the use of Ensto solutions definitely prove its actual potential in Indian market too. Our high-quality products make it possible to construct electricity networks with low failure frequency irrespective of parameter of voltage fluctuation. Ensto products are really safe and consumer friendly. Industrial energy efficiency is essential for strengthening economies, protecting ecosystems and achieving social benefits. There is no specific band for customers. India, being such a big country, needs to be organised from the very beginning; starting with installation of transformers, smart grids and voltage boosters.”

Insufficient investments have been made in electricity networks. The consequences are visible increased electricity consumption stretches the existing networks to their limits, which leads to lower voltages and poor quality of electricity. Uninterrupted service and lower maintenance costs are a built-in advantage of the complete, tailor-made products.

However, in addition to the reliable accessories, Ensto offers extensive training on how to build a reliable electricity grid.

“We enable our customers to have a one-stop purchase experience. Ensto Pro contains a wide variety of technical training sessions, both practical and theoretical from real product installations to theory lectures on electricity network design. Such training has proven to have a significant impact on the electricity distribution market on our way towards the smart grid,” informed Mr Kaushik.

Mr Bhaduri added, “We are slowly but steadily positioning ourselves with our broad spectrum of offerings, starting from building IT infrastructure, implementation and sustenance services, most importantly integration services. Having said that there is a huge opportunity that exists in building on this with our consulting and integration services around performance management, working alongside our customers in implementing enabling tools for optimal use of energy. This is actually the road to transformation for a utility.”