

INDIAN SWITCHGEAR AND CONTROLGEAR INDUSTRY- WAITING TO TAKEOFF

Domestic Power Sector Scenario – Opportunity for Electrical Equipment Sector.

India is well on its way to becoming a global supplier of goods and services. An efficient power supply system is the key ingredient for a country's economic growth and quality of life; unfortunately, shortage of electricity is one of the foremost constraints in the ramping up and sustaining our growth momentum.

At present, India has an installed generating capacity of over 180000 MW, however the peak demand gap has increased to about 16% recently due to coal shortages. The Indian Government had set an ambitious goal in its 11th plan for generation capacity addition of about 100,000 MW (subsequently scaled down to 62000 MW) to meet the objective of 'Power for All' by 2012. Reportedly, the achievement is expected to be a maximum of 55,000 MW.

With focus on increasing generation capacity over next 8-10 years, the corresponding investment in transmission sector is also expected to increase (In generally equal proportions of Rs. 5 Crore/MW for Generation and Rs. 5 Crore/MW for Transmission and Distribution). Current installed transmission capacity for evacuation is an emerging bottleneck, further outdated distribution system with huge AT & C losses is a cause of serious concern, hence there is an urgent need for enhancement and upgradation of the transmission and distribution (T&D) infrastructure to evacuate additional power across the country.

The government has pulled out all the stops to attract investment in this sector and has taken various steps to make the sector attractive for investors. The Electricity Bill 2003 has provided impetus to the power sector. It has also catalyzed the much needed reform in the EBs with many of them turning profitable after unbundling into independent entities and managed as SBUs.

CERC and SERCs too are playing an important role in regulating the sector. Public Private Partnerships are on the increase and the Electricity Boards are opting more & more for turnkey solutions from EPCs. The Government had also initiated the Accelerated Power Development and Reform Programme (APDRP) in order to minimize aggregate technical and commercial (AT&C) losses at the distribution level, with the objective of improving the financial health of state electricity boards (SEBs),

The APDRP is now well on in its second avatar R-APDRP correcting the IT & Metering side of the distribution. Equipment demand from Rural Electrification programme (RGGVY) and expansion of Generation, Transmission & Distribution networks too is expected. Ultra mega power projects (UMPPs), nuclear power program, JVs by public & Private sector for manufacture of plant equipment including supercritical 800 MW turbines & boilers and Balance of Plant (BOP) equipment etc too are under progress to help debottleneck the power generation program.

Renewable/Alternative energy initiatives like wind, solar-thermal, biomass, mini/micro hydel etc are gathering steam. This scenario presents a huge opportunity to the Indian electrical Equipment industry including Transformers & Switchgears

The Indian Switchgear Industry.

The Indian electrical equipment industry comprising of multinationals, large medium & small players is fully geared up producing, supplying and exporting a wide variety of electrical equipment including switchgear and controlgear items needed by the expanding industrial and power sector on which we focus in this article. This industry sector in fact manufactures the entire voltage range from 240 V to

800 KV. 1200 kV equipment is under indigenous development for the 1200Kv Test station at Bina, MP. The current technology level in India is Contemporary.

It is estimated that the present size of the Indian switchgear industry, is around Rs. 12,000 Crores . The industry grew by about 21% in volume terms in 2010-11. Overall exports decreased by 8%, whereas imports increased mainly for MV/HV by more than 25%. Weightage of Switchgear industry based on IEEMA electrical industry Index is 15.2%. The population of IEEMA members from switchgear industry is around 140 members.

Currently, the MV & HV segments are suffering from overcapacity due to lack of orders. Inadequate demand could be due to insufficient planning by the users and delay in finalizing tenders. Unfortunately bunching of orders also creates supply-delivery problems. Also L1 (lowest quoted price) procurement system followed by all utilities i.e. procuring products at lowest price creates a hurdle for bringing good quality material in the system. Further insistence on repeated type testing of products in spite of inadequate type testing laboratories poses additional delays and harm to the equipment.

MARKET OPPORTUNITY FOR LV, MV, HV & EHV SWITCHGEARS

Utilities Segment

HV and EHV demand majorly derives from the utilities. India's power generation capacity of 2,300 MW in 1950 expanded to 180,000 MW in 2011. With the Eleventh Five Year Plan (2007-2012) the capacity is expected to increase by a maximum of 55,000 MW. The Government is focusing on increasing the penetration of Electricity in villages. Schemes like R-APDRP and RGGVY are providing an excellent opportunity for the LV and MV switchgear market with large number of villages yet to be electrified.

Industrial Segment

India's industrial sector accounts for about 30.0 percent of GDP, with most of the industrial divisions reporting growth in output in the fiscal. An increase in process automation levels observed which support push-buttons, contactors and switching relays, as well as the protection relays market, which finds application extensively for motor control. Investment in new infrastructural setup is set to increase the market for ISGs, RMUs, MCCBs, ACBs and C&Rs. Another indicator of sustainable growth is the increasing gross assets of organisations

Commercial and Infrastructure

Infrastructure sector is one of the most important thrust sectors in the Eleventh & Twelfth Five Year Plan of the GoI with an estimated investment of \$475 billion over next five years upto 2017;

An average GDP growth of about 7.6 percent and massive investments from the private and public sector are expected to drive the growth in infrastructure segment. This includes modernization of crucial economic and social infrastructure, such as new hospitals, commercial complexes, IT Parks, Shopping Malls, Ports, railways, Metro, roadways and schools etc

Infrastructure development is expected to benefit the Ring Main Units(RMUs), Intelligent Switch Gear, Air insulated and Moulded Case circuit breakers market for switching, control and general protection applications.

Residential Segment

In the residential construction sector, the market has picked up in 2010-11 post recession and with support from the government. The prices of real estate are firming up and projects which were on hold have restarted. Continued growth of the residential sector is likely to drive the MCBs, ELCBs and MCCBs market which has already clocked a growth of more than 20% over last fiscal. Recently the revised National Building Code NEC 2011 in line with the latest IEC code has been launched. This will help improve both Electrical & fire safety for the common man.

Power Plant Modernization and Refurbishment

As in other parts of the world, numerous power plants in India are nearing the end of their service plan, thus requiring overhauling and modernization. This includes replacement of existing transformers, which are on average over 30 years old and the replacement of LV, MV and HV switchgear. Power plant modernization and refurbishment is expected to additionally support growth of the switchgear market.

Alternative Energy Sources

The India Government continues to research and invest in renewable energy sources such as wind, solar-thermal and hydroelectric power. The renewable energy market has grown by about 2400 MW to 20,100 MW the growth in this segment is likely to sustain at current/higher levels percent over the next 4-5 years. The increase in investment in alternative energy sources is also expected to support market growth, as LV and MV switchgear products are required for general protection as well as switching. The MCCB and MCB markets are expected to benefit considerably from alternative energy expansion.

New Developments/Trends in the Switchgear Industry

The switchgear industry continues to innovate and upgrade its products to meet the evolving/future needs of its customers, the following products/trends

Low Voltage Switchgear

- Increased acceptance of electronic releases in circuit breakers
- Embedded Intelligence and communication enabled
- Improved materials for cost saving, environmental reasons and ROHS
- Movement from motor starters to submersible pump controllers
- Soft Starters
- Increased use of modular device in building electricals.
- Vacuum contactors for higher ratings.
- More use of magnetic actuators
- Field for Life-Maintenance free (IEC- M2 duty -10000 Operations)
- Shift from Electromagnetic to Numerical relays
- Shift from Electrical sensors- CT/PT to electronic sensors.
- Ring Main Units
- Intelligent switchgear
- VCBs with higher ratings

High Voltage and Extra High Voltage Switchgear

- Compact GIS
- Compact AIS
- Compact switchgear
- Controlled switching
- Solid State switchgear
- Intelligent switchgear
- VCBs with higher ratings (50kA – 4000Amps)
- 800-1200KV Ckt Breakers under development
- Substitute for SF6 gas
- Harmonisation of protocol IEC : 61850
- Package substation
- Polymer of HV equipment
- Smart grid.

Weaknesses

- Switchgear industry has to largely depend on the financially weak EBs for its sales, The EBs condition has increasingly worsened over the years.
- Uncertainty & slow pace of reforms
- Increasing Competition from unorganized sector and Chinese imports
- Macroeconomic challenges which constrain public & private funding and High Interest rates
- Low investments in R&D, Lack of Innovation
- Integration/Assimilation of new technologies into development of new products in the sector needs improvement
- L1 procurement system in utilities i.e. procuring products at lowest price creates a hurdle for bringing good quality material in the system.

Threats

- Underutilization of installed capacity
- Lack of HV switchgear test facilities in the country
- Increasing competition from unorganized sector in low end/low tech items/imports in LV segment and project imports.
- One sided contracts by the user industries/ Price Variation contracts not accepted by many users
- Improper procurement planning/bunching of orders,
- Entry of unproven contractors/ sub-contractors with minimal technical knowledge.
- Lack of standard specification and design parameters clubbed with increasing trend of customisation is adversely impacting the delivery schedule as well as taking away benefits of economies of scale.
- The new Clause of consequential damages which in short means an organisation supplying an equipment is not only responsible for the supply but also for the damages arising out of the equipment.

Opportunities

- Generation capacity is expected to be augmented by around 150,000 MW under 11th & 12th Five Year Plan (2007-2017). More than 60000 MW under construction.
- The T & D network expansion
- Schemes like APDRP and RGGVY are providing an excellent opportunity for the LV and MV under, “Electricity for All” initiative

- Expansion of key industry sector (cement steel petrochemicals, telecom & others)
- Expansion of Infrastructure like Telecom, Railways, Airports, ports, Roads, Hospitals etc.
- Replacement & retrofitting programmes.
- 800-1200kV transmission line development

Looking at the gap in technology in India It was felt that there was a lack of real R&D activity and innovation in the industry. In order to take concrete steps to encourage R&D activities, IEEMA regularly organizes International Technical conferences every 3 years. SWICON-2011 the eight in the series has attracted 60 technical papers from Domestic & Overseas experts. The theme “Emerging trends in switchgear” aptly represents the need of times.

Three International Keynote speakers will share their knowledge & experience with the 400 strong technical experts including engineering students & Professors in the two day international conference on switchgear & controlgear at Hotel Lalit Intercontinental, Mumbai.