



Spinning Excellence

Many spinning mills in India are under a lot of stress, particularly owing to increasing costs of raw material and power. **Sanjay Arora** and **Gagandeep Garg** write about the challenges and solutions.

India is one of the few countries in the world which has production at each level of textile manufacturing viz. fibre manufacturing, spinning, weaving, knitting, processing and garmenting. The textiles sector is the second largest after agriculture in India. Significant growth has been observed over the years, which motivates entrepreneurs to invest in the industry or to expand their existing plants.

However, the Indian textiles and apparel industry has struggled in FY18 due to the lingering effect of the goods and services tax (GST). The overall consolidated sales of the top 10 companies increased by 2 per cent during FY18. However, the EBITDA (earnings before interest, tax, depreciation and amortisation) declined drastically by 16 per cent in the same period.

Due to increasing raw material, power and other costs many spinning mills are under stress. Textiles is one of the sectors which accounts for most of banks stressed assets. Many companies are declared NPA (non-performing asset) and are under National Company Law Tribunal (NCLT) at the present.

Higher volatility in cotton prices have impacted the complete scenario for spinning mills. Mills with lower spindle capacity or narrow product range face challenges during market volatility. Lower manufacturing costs, higher productivity rates, labour skills and uniform

quality can lead to higher profitability. To sustain in the competitive market, efficient operational management is required. Regular monitoring and value addition to the process is essential to move forward.

Followings are the main challenges faced by spinning mills:

1) Lower Productivity

Productivity is the major factor affecting directly on yarn cost. In practicality, mills are following same standard of GPSS (gram per spindle per shift) or productivity for a long time now. They are more focused on production, instead of productivity. Major spinning leaders have raised their standard of productivity by modernising machines or optimising process parameters. Preparatory processes play an important role in ring spinning. Better processing of raw material with uniform quality helps in gaining more productivity in ring frames and lesser cuts in the winding section. The major factors influencing yarn productivity are as under:

- ▶ Improper bale and lot management in mixing department;
- ▶ Different proportion of usable waste mix up in bale laydown;
- ▶ Not following proper method of bale storage and conditioning;
- ▶ Regular sliver quality monitoring system for individual cards is missing;
- ▶ Lack of sliver breakage monitoring and their rectifications;
- ▶ Improper follow up of machine and general cleaning, which leads to higher neps;
- ▶ More variations in lap weight;

- ▶ Irregular checking of neps removal efficiency (NRE %) at card and comber stage;
- ▶ Randomisation process is not followed at various stages;
- ▶ Top roller changing method is not followed in draw frame;
- ▶ More variation in top arm pressure of speed frame and ring frame;
- ▶ Wrong selection of particulars for different count range;
- ▶ Imbalanced work load on operators and skill gap in mending and piecing;
- ▶ Higher doffing time and downtime;
- ▶ Adverse condition of working components e.g. bobbin holders, top arms, bottom aprons, cots, ring rail, lappet hook, spindle buttons, spindle tapes, etc;
- ▶ Improper creeling and increased idle spindles;
- ▶ More yarn breakages and fly accumulations in ring frame;
- ▶ Return air and supply air not as per recommendations;
- ▶ More fluctuations in RH and temperature of the humidification plant; and
- ▶ Improper schedule management for maintenance cleaning, lubrications and general cleaning.

2) Low Utilisation Level

Various factors are involved in the lower utilisation of spinning processes. These include more downtime due to adverse working performance, labour shortage, quality distortion, doffing loss, etc. Proper gap analysis and right approach to meet the standards is very essential to meet standard of the utilisation level.

Labour shortage problem is commonly faced by many spinning units. Due to unavailability of operators or more absenteeism, it results in higher downtime of machines. Old units without auto doffing systems or modernisation are highly dependent on workers and producing less utilisation.

3) Lower Efficiency

Higher efficiency is a must to maintain the productivity level of existing spinning mills. Lack of technology upgradation, manual controlling of machineries, increased work load and higher dependency on manpower



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leads to lower efficiency. Improper tools and material handling, lack of knowledge about machine operations and functions are the main barriers in case of lower efficiency.

4) Poor Yarn Realisation

Improvement in realisation is must to match industry standards for better profitability. Raw material covers major part of inventory and directly influenced with the realisation factor. More generation of waste leads to lower realisation. Wastage is more when process engineering is not up to the mark. Optimisation of process is essential to control waste level in blowroom, carding, comber, ring frame and autoconer. Soft waste can be used in back process up to some extent but hard waste can't be reused. Losses also occur in the form of invisible waste, e.g. fly, fluff, etc.

5) Higher Power Cost

Power and fuel are the major factors affecting yarn cost. Consumption of power can be controlled for both old and new machinery by proper analysis. In old machineries, most of the mechanism is mechanical and require high capacity motors to drive them. Heavy shafts and couplings are used in mechanical buildup of machines. Due to heavy mechanical mechanism of old machineries, power consumption is on the higher side. Leakages in compressed air pipes and more load on specific machines increase power consumption of the unit.

6) Lack of Modernisation

Most of the units are still using old machinery for yarn manufacturing. Technology has been upgraded to deliver best results. These include auto doffing system, bobbin transport system (BTS), spindle individual monitoring system (SIMS), roving individual monitoring system (RIMS), variable frequency drive (VFD) control system, etc. These modernisations in technology uplift the standards of working performance and productivity level. Use of right technology and regular monitoring change the profitability of the spinning mills. The Central and state governments are contributing in technology upgradation via schemes like the Technology Upgradation Fund Scheme (TUFS).

7) Less Emphasis on Product Development, Value Creation and Services

Market demands keep varying as per fashion trends and specific requirements of consumers. Due to a significant improvement in the economy, superior goods are more preferred in place of inferior goods. We need to modify count ranges of yarn or types of yarn as per market demands. Most spinning mills are focused on producing normal yarn, while market demands shifted towards special yarns e.g. compact yarn, fancy yarn, siro yarn, lycra yarn, melange yarn, neppy yarn, slub yarn, etc.



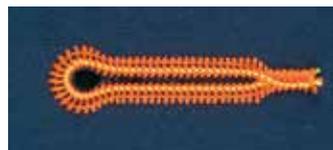
Timing belts, servo drives or variable frequency drives, modified circuits, etc, have been developed and successfully implemented in many spinning units to reduce power consumption.



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The prevailing problems in the spinning sector are due to the reasons like lack of exposure for the staff as they are trained in the same conditions which lead to lack of knowledge towards the best practices in the industry. The routine staff is unable to identify the gaps in the process due to the familiarity with the ongoing process. Apart from concentrating on regular processes, special attention is required to be paid on development section. Cumulative loss ranges from 5 per cent to 20 per cent due to low productivity, poor yarn realisation and high power costs.

The operational part is way behind from its own capabilities. Few of the spinning mills have already achieved the industry best, and have started focusing on implementation of new strategies and operational excellence. Many plants are still in a struggling phase and require proper guidance. A third party evaluation is the need of the hour which will help in productivity improvement. Specialised consultants with hands-on experience in domestic and international markets should be consulted for the gap analysis, monitoring and value addition.

The following methods can be adopted for prospective of operational excellence:

Gap Analysis: Identifying gaps is the most important part, which helps in creating roadmaps to manufacturing excellence. A panel of experts can be deployed or hired who have a deep understanding of various departments. Joint efforts of the panel help in finding a root cause analysis and prepare a detailed report. Based on the detailed report, a robust action plan can be prepared which would be fully capable of filling the gaps and benchmarking the level of profitability via innovative strategies.



A systematic method is followed for identifying the gap. Current process parameters of spinning processes analysed in terms of productivity, quality, man, machine, maintenance activities and unit power consumption. Benchmarking of company's data with industry standards and audit for practical observation of gap. After complete assessment of process, a detailed step-by-step plan is to be followed for filling up the gaps.

Implementation of Roadmap to Manufacturing Excellence:

In order to stay competitive in the domestic and international markets, continuous improvement is must in terms of higher productivity and quality. The following steps are required to be followed for betterment of spinning processes:



- ▶ **Process Optimisation:** Continuous improvement in productivity level, quality, utilisation and yarn realisation is very important for efficient working of operations. Optimisation of process can be done after proper analysis of processes. Due to poor process engineering at preparatory processes and adverse conditions of humidification plant, high TM needs to be imparted in ring frame for better working performance. Step by step action plan is required for optimisation of processes from blowroom to ring frame. Machine and process settings are required to be fine-tuned, so as to match with required quality level with controlled wastage. Technologies like roving individual monitoring system help in controlling waste levels in terms of less fly generation and less pneumafil waste.
- ▶ **Technical and Technological Upgradation:** Rapid improvements have been done by textile machine manufacturers to simplify work practices and achieve higher productivity levels. Few technologies can also be implemented in old machinery as well. Selection of the right technology for the product is very essential to gain maximum output. Upgradation in technology helps in reduction of manpower, increase in productivity, lower power consumption, less maintenance costs, etc. Manufacturing of special yarn requires retrofit arrangements, additional attachments, sourcing of material, etc, which need proper planning and execution. With the help of upgraded technology, new products can be efficiently manufactured on old machineries as well.



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- ▶ **System and Processes:** Labour is extensively involved in different processes. Developing systems and following them perfectly is the biggest task. Many industries have been following traditional systems over the years and struggling to retain them. Standard operating procedures (SOP) must be followed in such a manner to maintain productivity and make processes more efficient. Regular monitoring of current processes and establishing new systems as per current requirement are essential to seal the gap. Bypassing of systems and rules create hurdle in maintaining standardisations of the processes. Time to time audits can help in cross-checking systems and processes.



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- ▶ **Power Saving:** Many steps can be initiated for improving power costs by smart engineering. Based on analysis of individual machineries or plants, corrective actions can be initiated to improve power consumption. High efficient bearings with suitable grease used for smooth running of shafts reduce the load on motors. Timing belts, servo drives or variable frequency drives, modified circuits, etc, have been developed and successfully implemented in many spinning units to reduce power consumption. Humidification plants also have a large scope of improvement by regular checking of compressed air pipelines, supply air and return air maintenance. Corrective actions can be initiated after identifying the scope. Further, the power cost factor is taken into consideration and mechanical mechanism modified with electronic and electrical systems controlled by programmable logic controllers (PLC) for new machines. The scope of power saving has increased with the latest technologies. Machine manufacturers are also providing separate kits for power saving.
- ▶ **IT Focus:** A centralised data monitoring system not only helps in making a database of the processes, it also helps in achieving a higher efficiency and improved quality of production by regular tracing. Management information system (MIS) and enterprise resource planning (ERP) are widely

used monitoring systems in the spinning industry. Data monitoring at regular intervals helps in quick identification of trouble creating parts and rectifying the same at the earliest. More data collection helps management in decision-making for continuous improvement and value addition.

- ▶ **Skill Development:** The right skills for the right operations are essential for effective utilisation of manpower: sorting in maxing, sliver and waste handling in preparatory, cleaning of machines, and creeling of material in different stages, piecing in ring spinning, gaiting and doffing in ring frame. Workers must be trained in these practices for better handling of machine operations and functions. Classroom trainings and field training of workers enhance skill levels of operators. Dos and Don'ts must be explained to workers for reducing human errors.

Achieving operational excellence in textiles industry has become imperative to sustain the growth that India has achieved. It is a path in which organisations continually develop and evolve to deliver extraordinary performance in operations and management, thus leading on a path to success.**FF**

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