

# CONDITIONAL MONITORING IN TEXTILE SPINNING MILL

- The three main aspects of monitoring the mill is Textile, Electrical & Mechanical. Presently most of the mills have concentrated on Textile associated savings etc. Now if they concentrate more on Electrical Energy input to machines and their Mechanical Maintenance by Predictive and condition Monitoring, we can derive maximum productivity with minimum losses by directing right energy inputs to machines.
- Electrical Distribution - Now the priority to the industry is to concentrate more on KVA than KW and we need to do first achieve PF around 0.8 + at load end motors using capacitors. To assess the electrical distribution losses, PF at the load end is the best practical tool. Please look into your PF at the SSB and at heavy load motor terminals.
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- Thermal imaging of your Electrical distribution network up to the motor terminals and alignment related hot spots on load end can give around 2 % savings & increased production due to correction at load ends later. The symptom of distribution losses at the Electrical Incoming and at the load end is the HOT SPOTS only measured by low cost Thermal gun & high cost Imaging.
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- The Infrared gun (cost Rs.3000 +) only measures thermal parameters like abnormal temperature, temperature gradient, etc this speedy assessment is a quick tool to diagnose all abnormal Hot spots and warns you about the impending breakdowns priorly in the electrical side and in the mechanical side in the running machines.
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- Electric Motors - Please concentrate on your motors up to 10 HP motor where you're per hour loss is around 2 units. These motors lose up to 35 % on losses where as above 10 hp motors lose around 15% .Focus at Pyramid Bottom
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- A conventional or standard motor running at 50 % loading is operating at 70 % plus efficiency and where as the Energy Efficiency motor at 50 % loading less than 90 % and almost we get difference in efficiency of around 15 %. This is Huge Loss we face now with our existing motors and how efficiently we have loaded motors?
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- The mills are losing heavily now at this lower speeds due to hotter motors. More it is cool, more is Efficient. Active ventilation and right lubrication is the focus area now to reduce motor losses & improve its output
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- Running ring frame main motors on auto delta Star mode gives savings around 5 to 10 %. Now the conditions are that instead of 18000 rpm now only 12000 rpm running say and the loading is around 30 to 40 % level only. To protect whole circuits by providing Fool proof Electronic Overload & winding protection relays.
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- A standard motor operated at an average half the load – its efficiency increases around 4 % when operated at 400 volt plus instead of 440 volt especially at night, in the industry with out OLTC Transformer
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- Energy Metering - Now in the market, branded 3 phase 4 wire panel meter (cost Rs.2000 +) Worth trying it! Our rational, national, logical thinking is to invest first in this meter before running the motor above 10 HP. This Rs.2000 /- investment is a tool to assess how much you are lose in your

10 HP motor like say Rs.4000/- per month due to difference in efficiency say from 75 to 90 %  
Metering motor helps you to know your motor working better for you or not!

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- In the market, clamp on power multi function meter (cost.9000 +). When EB is charging the industry in KVA, KW, PF then we should be in a position to measure the above instantaneous power parameters of individual equipments & account for total EB consumption.
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- The cumulative measurement using the 3 clamps simultaneously and a 3 phase 4 wire multi-parameter power Meter gives indication of production health i.e. productivity (cost Rs.18000 +) Big mills also need one, instead of keeping only one Rs.one lakh worth Power Analyzer & keeping in shelf for months. For Small mills, this is ideal tool to study power in Doff cycles for various counts & speeds etc
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- Our spinning mill is an alignment oriented industry. All our loads are tangentially coupled to motors. The production is not steady due to misalignment inside machines. One of the reasons we must measure both KWH, and KVAH is that PF is varying to loading patterns. Hence when doing Doff study with the above meter, the above parameters are important to know the demand from the load in terms of KW, KVA.
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- Compressed Air System - In the Compressed air header ring main distribution Tail end Air receiver at can give savings around 10% in power, since air receiver slows the air velocity less than 6 meter per sec and does not create artificial demand. So pressure gauges at each tail end of distribution will show us daily the pressure drops in system.
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- Humidification Plant - Generally the roof heating by solar radiation causes 50 % of the heat load in any premises. Hence attic Ventilation is low cost & preventive compared to high cost of cooling of equipments & premises under attic.
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- In the Exhaust fans of AC plants, Pressure die casted blades of weight 15 kgs instead of the existing gravity casted blades of weight 35 KGs in the Exhaust fans will bring down the power consumption by 

20%	without
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 Compromising static pressure across the air system and maintaining the same flow rates inside the premises.
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- Some of the mills do cost cutting by not running exhaust fans. This is not healthy sign of working. If at all you want to save power, clean the air filters in the return air exhaust frequently & reduce restrictions in line.
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- Textile spinning mill is an air operated industry; we need air to push and pull the raw material from input end to output end of mill. Also we need air to comfort the yarn to enhance productivity thro Humidification. The same air is needed now to remove the waste from the main product in different stages thro AWACS. Hence portable anemometer (cost Rs.3000 + ) is a must to measure air velocity at humidification fans, supply diffusers, return ducts, air movement across hot spots, exhaust passages, attic ventilation.
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- In the Textile mill AC plant water circuit, we can do ring main distribution and loop all the top blind flanged ends of the vertical sub headers back to tail end of main discharge header of pump. This ensures in the long run, no choking of nozzle and all nozzles get equal pressure & flow of water. This is power saving too. Please install pressure impulse line at pump discharge and fix pressure gauge at the outside of plant so that daily pressure variations is seen to know nozzle plugging & pissing, filter blockage and spray dwell time.

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- Raw edged inner toothed belt gives saving of 3 to 5 % in belt driven loads from motors. This is easy to do today, can be done quickly and easily, than to think of replacing flat belts a year later. Definitely flat belt gives savings but installation difficult?
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- D.G.set efficiency -The genset sub systems like air, fuel, cooling and lubrication to be individually looked into for better maintenance. Because we get around one third of Kcal output as Electricity for 1 liter of Diesel. Since efficiency of electricity generation from our genset is poor, definitely there is more scope for better UPL.
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- The maximum Demand Controller fitted to DG set will help us to set & get max units per liter of diesel. Care is taken on genset air intake temperature, pressure drop, exhaust temperature & pressure to optimum level. Ducting out air intake with nylon pre filter, and ducting out heat exchanger exhaust is done to keep house cool. Taking care of its ageing factor & KVA rating, Higher the loading of genset, better is the UPL.
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- Good House keeping (visible! & Invisible!)- Of the nearly 20% saving in energy studies have shown at 5% savings come from Good House keeping .5% comes from conventional technology. And 10% comes from Innovation from the work spots only. The good or bad things happening to us cannot be from outside but it generates from inside only. Good house keeping practices inside & outside the machines is only the ideal way of cost cutting exercise available now.
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- By energy conservation in the industry, we try to recover the losses which go as waste. By Energy Measurement, we draw a line between Avoidable and Unavoidable Losses and plan to minimize same. So Measurement is the first step to Conserve Energy. The mill M.D. / management have taken the initiative to buy energy efficient equipments. This is half done only. If they give thrust to efficient running of the machines & focus on the invisible electricity losses in the daily routines, then definitely their operating profit margins can improve drastically.
- MLM & MLA can only help the industry now. MLM - Micro Level Monitoring & MLA - Macro Level Analyzing of our existing machines power & energy parameters is the need of hour now. The industry manager finds it difficult to meet the ends, the cotton & yarn prices. But if he regulates & minimizes the power consumption of each machine he will be delighted to his margins are under his control and improves more.
- The major initiative towards ECON in mills, what we are concentrating now is that we need to measure the Energy inputs (Electricity, fuel oil, water and Air inputs) fed to the mill and that how they are affecting the UKG. There is considerable amount of cost saving in the mill if we switch over from breakdown maintenance situation to a Condition based monitoring & control of the machines & utilities. That is we do not allow the machines to break down at all.
  - **S.ASHOK, BEE certified Energy Auditor/Coimbatore/ Mail - Call - 94437 20220;**
  - **Pls. visit site [www.energymeasuretosave.com](http://www.energymeasuretosave.com) for practical energy saving tips.**

**Sharing knowledge to SAVE OUR ENERGY !**

**Conserving Energy is OUR Collective Responsibility, for a Better Tomorrow!**