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1. Industrial Engineering for Apparel Production Presented By: Lutfor Rahman Shanzid ID: 2015-2-2-013 Md. Niloy Rahman ID: 2015-2-1-010 2. Contents • Definition of Industrial Engineering (IE) • Objectives • Key person(s) • Role of Industrial Engineer(s) • Basic techniques in IE • Relations of key persons 9 April, 2016 2 3. Definition of IE A branch of applied sciences • Engineering knowledge is applied to the planning, design, and control of industrial operations by integrating peoples, materials and energy in productive ways. 9 April, 2016 3 4. Objectives of IE Department • Monitoring production floor and having better control over the production floor • Improving processes and method of working to increase factory's overall performance and standardized garment manufacturing processes • Contribute to the success of companies through effective problem solving 9 April, 2016 4 5. Key persons Industrial Engineers Merchandisers 9 April, 2016 5 6. Role of Industrial Engineers To effectively & efficiently utilizing the • software technologies • Machine tools • Math • Scientific concepts • Managing the human resources • Demand of customer satisfaction • Time schedule 9 April, 2016 6 7. Role of Industrial Engineers (cont.) • Evaluation of existing production target and fix a new production target. • Constant control of direct labor cost. • Data analysis and look into monthly trends • Preparing daily production reports, Monthly improvements reports with graphical presentation. • Time study and updating time study database including videos on constant basis. • Research on motion study and implementation of the better system to eliminate excess motions. • Research on new machinery and latest systems that meets companies long term goal and preparing cost benefits analysis • Research and development for samples prior to production start. 9 April, 2016 7 8. Scope & responsibilities of IED IE OPERATOR'S & LEADER'S TRAINING & DEVELOPMENT PRODUCTION PROJECT ENGINEERING PRODUCT & PROCESS ENGINEERING PRODUCTION MAINTENANCE 8 9 April, 2016 9. Basic Techniques used in Industrial Engineering • Work study • Capacity Study • Method Study • Time Study • Operator Performance • SMV 9 April, 2016 9 10. Techniques of Work Study Work Study Method Study (better way to do the job) Work Measurement (time it takes to do the job) Higher productivity 9 April, 2016 10 11. Qualities of Work Study practitioner Personal qualities – Sincerity & honesty Enthusiasm Interest in & sympathy with people Tact Good appearance Self confidence 9 April, 2016 11 12. Time Study Definition of Time Study – Time study is a work measurement technique for recording the times of performing a certain specific job or it's elements carried out under specified conditions, and for analyzing the data so as to obtain the time necessary for an operator to carry it out at a defined rate of performance. 9 April, 2016 12 13. Handling the next garment Machine Start Machine Stop 0 1 5 3 0 4 5 Pic k up 18 sec. 18 sec. Sew 45 45 sec. Dispos e 51 51 sec. Sew: 45–18=27 sec. 27 sec. Place 51–45=6 sec. 6 sec. - Continuous time observation- 9 April, 2016 14 15. Capacity Study It is a measure of the operator(s) capability. Procedure : • Use of stop watch • Measure the time study • Average the time cycle This average cycle time measures the operator ability to do the particular job. 9 April, 2016 15 16. Method Study Recording & critical examination of existing and proposed ways of doing work 9 April, 2016 16 17. Relations of key persons Without cooperation between Industrial Engineer & Merchandiser, an IE department can not be run properly. So, inter-relation between Industrial Engineer & Merchandiser must be developed. 'Good inter-relation increases more profit.' 9 April, 2016 17 18. IE BASEMENT THE HOW FOR " 6 STAR " PERFORMANCE 18 5W 5M 5P • What • When • Where • Why • Who • Man • Machine • Material • Method • Management • People • Product • Process • Prevention • Productivity IE 5C • Creativity • Clarity • Characteristic • Conformance • Cost 5S • Standardize • Straighten • Sort • Shine • Sustain 5R • Research • Record • Review • Release • Result MEASURE WATCH ! CARE ! READ ! 4 5 6 1 2 3 9 April, 2016 19. 9 April, 2016 19 Industrial engineering (IE) plays a vital role in the apparel industry, that's why Industrial engineering job roles are very important for the garments factory. When we need to reduce costs and improve work efficiency in this competitive era, the apparel industry hires an Industrial Engineer to do that job smartly. The apparel manufacturing industry is growing quickly by applying IE in their facility. I this article I am giving a list of IE activities in a garments factory which will help you to understand the Roles of Industrial Engineering in Garments Factory. Objectives of Industrial Engineering (IE) in the Apparel Industry To increase productivity Process improvement by motion reduction. Reduce work in process (WIP) and remove the bottleneck. Increase the efficiency of operations Reduce man-machine ratio Process improvement to reduce cost, waste and rejection Reduce wastage and defects Fill up Key Performance Indicator (KPI) target. Keep workplace and environment safe Production planning and implementation Evaluate operator and staff performance, disciplinary matters, training needs, and career development. Set the target and make a draft, layout design of the machine requirement, material flow, and workstation to bring the best possible efficiency. Modern tools are used to design the layout. Monitor factory performance in terms of quality, delivery, cost-efficiency, and target improvements with the internal factory team and taking necessary corrective action. Manpower balancing, target setting, and monitoring achievements. Daily Activities and Duties of an Industrial Engineer in the Apparel Industry Collect the line loading plan from the Planning Department Attend in Pre-Production (PP) meeting Collect size set sample and make operation bulletin accordingly. Collect Operation Bulletin and make a paper layout Discuss with Maintenance in-charge regarding the machine, folder, attachment, and Technical personnel for technical issues. Make discussion with a floor in-charge about layout according to paper layout Check Daily Non-productive time (NPT) and reduce machine breakdown time. Make layout according to paper layout Make line balancing according to target and capacity study during 2 – 3 days of layout Find out the bottleneck process and solve it If needed make 1-hour production study in the required process Everyday input and output monitoring Give daily production target and follow up production achievement. Hourly production follow-up Everyday 5S related activities monitoring Cross-check thread consumption for every new style. Ensure up to 65%-70% efficiency. Workstation design Operators motion development by correcting faulty motion. Reduce worker absenteeism and turnover rate 5 pcs flow by reducing WIP Reduce line setting time or throughput time. Proper utilization of manpower by reducing unnecessary helping process. Establish a meeting in-between QC and operators regarding critical points of the style while the layout. Prepare daily Man/ Machine report Developing cut to ship ratio. Work to reduce absenteeism and operator turnover Roles of Industrial Engineering in Garments Factory pdf Roles of Industrial Engineering in Garments Factory The idea of industrial engineering is to plan, design, install, and adapt to an integrated system of men, machine and materials for the purpose of maximizing operational efficiency. It is not only concerned with the development of an integrated system but also continuous improvement of that system. In this article, I will share the importance and dimension of industrial engineering in apparel industry. Every garment factory around the world has a department that is well known as the industrial engineering department, which is the IE department. IE department plays a great role in ensuring operational efficiency and work plan. The Main Objective of Industrial Engineering (IE) Increase ProductivityReduce WastageEnsure Best Use of Scarce Resources Increase Productivity Like any other industry, the garments industry always working to increase the productivity of garments workers. The main factor of increasing productivity is to generate more output with the use of minimum input. In the case of garments manufacturing the increase of productivity means the production of more garments with minimum human resources. Reduce Wastage Garments wastage can generate in different processes. It can generate at the time of cutting, sewing, and finishing. A standard should follow so that the reduction of wastage can be ensured. It is an industrial engineer's responsibility to minimize the wastage in every operation of garments. Ensure Best Use of Rare Resources To ensure uninterrupted production it is necessary to supply each and every raw material in the right place at the right time for the right quantity. The industrial engineer takes an effective production plan so that the optimal use of rare resources can be ensured. The Dimension of Industrial Engineering (IE)in Apparel Industry Method StudyWork Measurement Method Study in Apparel Industry In this type of study, the IE department takes an operation/process and identify all the important factors or variables and then apply different methods to do the same job. By doing this they collect information and record it for all the important factors and their changes. After that, the most effective method is adapted. Continuous monitoring of the chosen method is done so that any required changes can be done with the existing process or operation. The method study is applicable to all the existing and proposed methods. Steps of Doing Method Study in Apparel Industry Selection of Work: The first step of doing a method study is to identify and select which job a method study will be conducted i.e. select which work to be studied.Identify the Important Factors: An industrial engineer will identify all the factors and among these factors, he/she will choose the most important factors which have an impact on the chosen work.Keep Record: In this step, all the selected factors should closely observe and keep the records of changes in the current method which is currently on use.Critically Evaluate: Critically evaluation is to be done so that if any advancement required for the current method then it can be chosen. In this evaluation phase, it will be determined whether the current method is a perfect one or need any changes or required totally new method of doing the same task.Develop New Method: Based on the analysis a new method of doing the work is developed so that an effective way of doing the work can be adapted.Clarifying the Method: Whenever a new method of doing work is developed, it should be clarified to the ultimate users so that they can use it properly and the goal of choosing a new work method is obtained.Adaptation: In this process, the new method is adopted by the respected workgroups and more efficient operation is ensured which increases the overall production of the factory operation.Continuous Monitoring and Improvement: After the adaptation of new methods, it is an industrial engineering department's responsibility to monitor the outcome. If there is any deviation of the expected outcome then it is required to work for the improvement of the newly taken method. Although improvement is the continuous process that is within the scope of the IE. Work Measurement in Apparel Industry Work measurement is the application of the techniques which is designed to establish the time for a qualified worker to carry out a specific job at a distinct level of performance. Time study is one of the popular tools of work measurement. Time Study in Apparel Industry The time study is a work measurement technique for recording the time of performing an individual for a set of conditions. After the recording process, the data is to be analyzed so that the standard performance rate can be identified. Based on the standard performance rate the target production rate is to be set. That's why a time study is an effective tool for industrial engineering (IE). In this time study method, the IE department works for calculating the Standard Minute Value (SMV) for each and every product which is to be manufactured in the garment factory. Here SMV means the total time required to produce a garment by the worker in his workplace. SMV is shown as a minute for each garment. Industrial Engineering (IE) in Apparel Industry



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