INTRODUCTION

Proper human resources management (HRM) is extremely important in the lean manufacturing system. In a firm that has embraced lean, workers would receive ongoing training to make sure their skills stayed up-to-date. They would have responsibility for checking the quality of their output, and for performing maintenance on their machines to prevent breakdowns. They would participate in kaizen events and other continuous improvement activities.

Human resource management is not an independently identified source of cost under the CCDR system. Costs incurred in training direct production workers, for example, are usually reflected in the overhead rates. In fact, aircraft manufacturers offered very limited information on how lean worker management techniques were being implemented in their plants. However, lean manufacturing does offer many insights into workforce issues, and this chapter is included to discuss particular topics in more detail.

LEAN HRM

Literature on lean manufacturing argues that the critical factor in implementing change and tying all the components of the system together is drawing fully on the mental powers of all employees in the production process not just management or engineers. Even the newest mechanics and operators have some insight into the machines, the processes, and the practices based on their day-to-day
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experiences. This is a source of expertise that can be tapped in any effort to make plants more efficient. As holders of critical expertise, manufacturing operators should be given the authority to make decisions relevant to their work, without having to get approval from a manager for routine decisions. They should also expect to have their suggestions for improvement carefully evaluated for non-routine areas or areas where part and process quality are critically engineered.

Without the assistance and buy-in of all participants in the value chain, organizations will not be able to make the change to lean manufacturing. Womack and Jones (1996, p. 264) suggest that “It has become conventional wisdom that higher levels of management should learn to listen to the primary work team since they know the most about how to get the job done.” The authors indicate, however, that this is not quite enough, that workers must be trained to understand pull techniques and in problem-solving methods. In his description of manufacturing improvements at Hughes, Roby (1995) suggests that along with low WIP inventory, early and intensive worker involvement was key.

A number of practices help the workforce contribute to manufacturing improvements. The primary one is management attitude toward production workers—they must be considered resources with the potential to contribute to improvements as well as to actual task completion. The lean HRM philosophy is best summed up by those managers who consider their production workers to also be process engineers.

A second aspect of lean HRM is maintaining a flexible workforce. This has two aspects. First, the workers must receive training on the new methods of production. One lean practice is “operator self-inspection,” where production workers are responsible for checking the quality of their output. If they are given this responsibility, they need training on such quality processes as SPC. If they are given responsibility for routine machine maintenance, they must be trained to do this. Both of these skills reduce the need for support personnel on the floor (quality inspectors and maintenance personnel) and reduce machine downtime while workers wait for the support personnel to provide the required services. In addition, the machine operator is in the best position to know when maintenance
downtime can be optimally performed, based on forecast machine scheduling. Furthermore, training in root-cause analysis helps workers get to the bottom of production problems and helps reduce their occurrence.

Another method by which lean HRM practice incorporates workers more fully into the production process is by developing production work teams. Workers get a chance to talk about quality and other production issues with others. Teams offer management a formal mechanism to use in tapping their workers’ skills and knowledge when trying to solve a production problem or to improve processes through kaizen events. As was discussed with reference to product design, IPT structures break down barriers between functions and improve communication. More effective product development and more manufacturable products can result. IPTs can and should operate through the life of the product, not just during the design phase, although their emphasis may change somewhat during each program phase. They should also enable cooperation and communication that can result in fewer levels of management. (The Toyota model calls for self-managed work teams, which were not in evidence anywhere in the defense aircraft sector.)

Matching lean manufacturing’s call for flexible machines and work cells is its emphasis on a flexible workforce. With a well-trained workforce and few job classifications, production workers should be able to be reassigned to different processes as needed. Lean HRM practices suggest that workers receive extra pay as they are trained on and become expert on more processes in the plant. Implementing this practice in union plants requires careful management and negotiation, however, as job classification falls into the “wages, hours, and working conditions” negotiation arena. Unions are often loath to give up the accepted and negotiated structure of job classifications because of the fear of attendant loss of power or without other concessions from management. They also seek to avoid a reduction in their membership.

Lean manufacturing calls for a new type of relationship between management and workers, just as it calls for a new type of relationship between the company and its suppliers. Trusting relationships characterized by mutual assistance must replace traditional relationships characterized by insecurity and distrust. This may be more
difficult in union plants, but literature suggests that it should be achievable. Trust between management and workers will help alleviate difficulties with simplifying job classifications and may even lead the union to become a helpful force for lean implementation. Literature on the lean model suggests that trust can be built by making a commitment to the workers through employment guarantees. However, making the transition to a leaner and more productive plant means that not as many production workers will be needed. Ideally, lower costs will improve the competitive position of the firm, sales will increase, and layoffs will not be required. This may not be a realistic hope in defense aircraft manufacturing, where volumes are limited. In this industry, one technique is for management to promise employment security for the remaining workforce after an initial round of layoffs. Note that without employment security, getting workers to participate in improving the productivity of the plant could be difficult, because they may try to avoid improving themselves out of a job.

THE DEBATE ON LEAN HRM—EMPOWERMENT OR EXPLOITATION?

Womack et al. (1990) aver that line workers in the lean system are in fact more satisfied with their jobs because of their ability to contribute mentally as well as physically to production. (Workers “think continuously of ways to make the system run smoothly and productively” [p 102].) However, this beneficent view of lean manufacturing as the solution to a century’s worth of labor strife is not without its critics. The various essays in Babson’s *Lean Work: Empowerment and Exploitation in the Global Auto Industry* (ed., 1995) offer an excellent introduction to the costs and benefits to workers of lean manufacturing. This work suggests that only mixed evidence exists that lean manufacturing benefits workers. In the volume, Parker and Slaughter (1995) argue that lean manufacturing really amounts to “management by stress.” Cutting all non-value-added work eliminates buffers that hide production problems and deviations but can mean that workers face continually increasing pressures, without empowerment, as the brief periods that they can allocate as they see fit are removed. MacDuffie (1995) (part of the original IMVP team at MIT) concludes that lean manufacturing offers an enhanced role for production workers, involving “thinking” work, ways to improve
production, “team” work, enhanced participation in a social entity, as well as “doing” work. Eaton (1995) compares the exploitation and empowerment approaches and finds that neither is an inevitable outcome under the lean production system. A proactive union approach can help defend workers’ well-being. In short, Eaton’s perspective is that workers must empower themselves through collective action under lean production just as in mass production.

The overriding message of Lean Work is that the idea that the lean production system necessarily leads to fulfilled and empowered factory workers should be reexamined. The lean system may be efficient and produce high profits and competitive advantages. However, managers should not confound their appreciation for cost reduction and quality improvements with worker gratification at making these improvements possible. In fact, Moldaschl and Weber (1998) suggest that the lean manufacturing work organization is merely a modified Taylorist approach.

In their conclusion to a study of an auto factory in Canada, Rinehart, Huxley, and Robertson (1997) agree that rather than being a post-Fordist approach leading to worker harmony, lean production has all too many similarities with mass production, such as a lack of empowerment of workers and all decisions being made by management. Again, this contradicts the arguments of the proponents of lean who state that unless the worker is actually participating in thinking and revising work processes, the plant is not truly lean and implementation of cost savings initiatives will not result in the greatest possible savings. As this argument indicates, the lean manufacturing system does have its critics. Those who claim that lean principles are a means to get increased productivity with or without the willing participation of the workforce may reflect many plants that have incorporated lean concepts like cellular or pull manufacturing. In an industry with excess capacity, such as military aerospace, and a limited number of customers, growing sales as a way of offering job security may be an unrealistic hope.

However, to a certain extent, acceptance of cost reduction initiatives that may result in a reduction of numbers of employees may be inevitable. At plant after plant, the contrast was never between lean or not lean with 100 percent of the workers. Rather, the choice was clear: lean with some percentage of the labor force or not-lean with
zero percent of the labor force, as the noncompetitive plant would be forced to close. Under those conditions, issues of exploitation versus empowerment become somewhat moot. In the reality facing the defense aircraft industry, cutting costs and eliminating jobs through lean manufacturing may be the only viable way to survive.

At the same time, the defense aircraft sector faces several near-term ramp-ups in production; for example, as the F/A-18E/F moves to full production, the F-22 joins it, and the JSF starts up in the future. Incorporating insights from lean production means that as production increases, fewer hires should be necessary and costs should be contained.

SUMMARY RESULTS ON IMPLEMENTATION OF LEAN HRM

During data collection, a range of approaches to HRM was visible. It also became clear that some sites have paid more attention to these issues than others. This was evidenced by their response to the questionnaires, with some sites not even bothering to provide answers to these questions. This creates a problem in representing trends or industry averages. Companies not reporting historical headcount or training cannot be truly assessed for lean HRM. Generalizable statements about the industry as a whole cannot be made without this information, as it is likely that the firms with little or no lean-related HRM efforts would be the very same firms that did not respond to these questions.

Companies that did respond indicated that, on average, workers get about 17 hours of training a year. (The low point was 15 hours, and the high point was 24 hours, with four data points.) Percentage of workers participating on teams ranged from 42 percent to 100 percent, with an average of 72 percent. (Nine data points make up this average, with some reports by plant and some by program.) It is impossible at this point to directly link lean human resources practices and lean savings in the defense aircraft sector, both because of limited information on the HRM practices and limited implementation and reporting of savings from lean manufacturing.

The limited evidence regarding the implementation of lean HRM practices indicates that there is a challenge—and an opportunity—for firms who are attempting to improve. The many analysts who
suggest that extensive worker involvement is the key to the lean system would be forced to conclude that no defense aircraft manufacturer is entirely lean.