"Diamond in the Rough Process" An Effective Front-Line Supervision Response to the Skills Gap

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INTRODUCTION

The skills gap is growing. Amazingly, companies have either responded slowly or not all to this business risk. This lack of response is the greatest risk business's faces today in meeting customer demands. As the skill gap increases, plants struggle with asset reliability issues, excessive rework, and product or service quality issues.

Instead of managing this risk many companies are increasing the risk by downsizing and re-organization. These "Right-sizing" efforts often include a variety of initiatives:

- Early Retirement Packages
- Elimination of Apprentice programs
- Elimination of Training departments
- Downsizing of Human Resources for recruiting and testing
- Outsourcing of specific skills
- Elimination of community college and school support

BACKGROUND

The education system in the United States is a numbers game of college placement and graduation. High schools benefit by placing a high percentage of students into colleges and universities that offer four-year degrees. Secondary schools receive more funding and a higher level of 'prestige' as a result. School systems often steer students away from two-year technical schools and apprenticeship programs to full four–year colleges. Many entering college enroll in 'non-technical' programs such as humanities or social sciences. As a result, an alarmingly low number of students are entering engineering and science in both 2 and 4-year degree programs.

The US Department of Labor reports that only 50% of those starting a 4 year degree will graduate. Out of the 50% that drop out of the 4 year program a small percentage about 10% go to a technical school. Those who graduate from the technical schools are obviously in prime demand competing for the best wages, benefits, and working conditions/locations. In certain demographic areas, 'new' talent is just not available. As a result, those retained by a company in any technical capacity, such as operations and maintenance, become a premium commodity. Their departure often has a significant impact.

THE CHALLENGE

Senior management must recognize and make tough business decisions to downsize or right-size an organization which may include the training function or department. An effective training department should be one of the last things to go but is frequently among the first. Sustaining effective training through a re-organization is, without question, a daunting challenge. Previous gains and improvements stand to be lost as training budgets, resources, and time are compromised. So what is the best way to manage this transition to a new 'leaner' organization after a reduction without compromising such an essential function as training?

Training roles and responsibilities are not eliminated but simply displaced to other positions. The positions which receive most of the responsibility are the supervisors. Supervisors have the job of getting the work done by managing the interface of the employee with the machines. If their department has been down-sized or support groups are not available to assist in managing the knowledge and skills inventory, by default, the supervisor becomes accountable. For the supervisor to be effective, (s)he must address the competency of those required to execute the work assigned to him or her. This is especially true when an early retirement package has allowed highly trained and experienced resources to leave the business. The efficiency of those remaining and performing technical work must increase otherwise some tasks will not be performed or work quality is of a lesser level. Re-organizations typically don't result in a reduction of the tasks that are required to be performed, just redistribution to fewer resources.

So the challenge for the supervisor is to implement a skills improvement program that yields results and provides a 'return on investment'. How do I improve my crew performance to increase profits? To answer this question, one must have an appreciation for the term 'reliable capacity'. Reliable Capacity can generally be defined as "meeting the customer expectation 100% of the time at a profit price." More specifically, operations and maintenance personnel ensure that factory equipment and systems operate as designed and are maintained such that production is optimized and not compromised as a result of poor interventions. From a

workforce perspective, what this boils down to is that the company has trained competent, qualified individuals to execute assigned tasks and responsibilities. With a qualified workforce, both internal and external Customer expectations can be achieved.

Here's a common scenario. The Vice President of Operations has requested that supervisors propose a plan to improve the skills of the workforce and directly impact the bottom line, moving the company towards World Class. The supervisor has just survived a right-sizing initiative and realizes that there is no one else in the company to complete this work. The following questions ensue as the supervisor tries to determine how to approach this challenge.

- How do I begin?
- What is the starting Point?
- How does a supervisor develop the skills to manage a skill improvement program?
- What are the hurdles or barriers for a supervisor to be successful in a job with more responsibilities?

ESTABLISHING A BASELINE

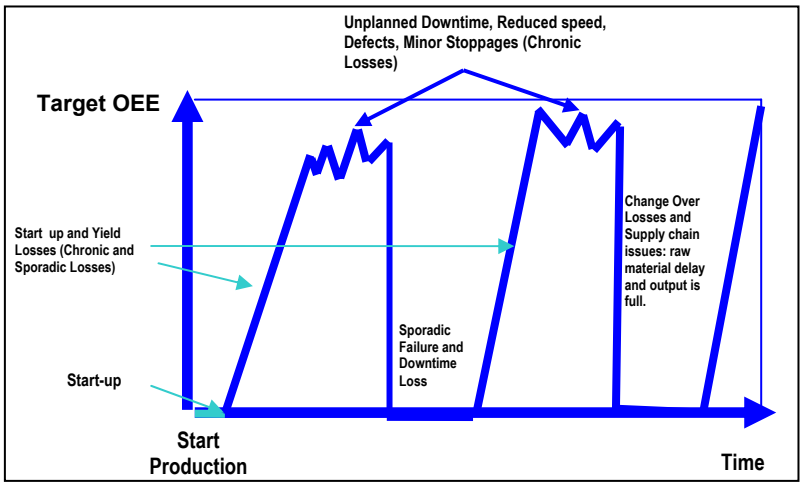
If training is provided for a skill which isn't used on the job or marginally affects performance, the productivity of the workforce does not change. An effective skills improvement program must employ a structured method to determine the skills needed by the workforce to improve performance and increase productivity. This increased performance is from operators and technicians not creating unplanned downtime, quality defects, or yield losses due to improper procedures or methods.

So how DOES one begin? Let's recognize that you may not know what it is that you don't know. The best place to start is by conducting Training Needs Assessment (Diamond in the Rough Process) which simply defines the strengths and weaknesses associated with a training function. There is a structured approach that can be adopted and implemented depending on the level of detail that may be required. For our purposes, the approach needs to evaluate the areas listed below.

1. Job Definition and Responsibilities including Core and Critical Duties
    a. Entry level requirements
2. Work Performance Issues (Technical and otherwise)
3. Training Curriculum (per position)
    a. Core/Fundamentals
    b. Advanced/Technical
    c. Continuing
    d. Qualification Process
4. Training Materials, Approaches, Media, Facilities
    a. Internal
    b. External (Vendor-ready)
5. Competency of the Existing Workforce Members
    a. Written and Performance Assessments
6. Supporting Technical Literature
    a. Standard Work Instructions, SWI's
    b. Standard Operating Procedures
7. Analysis Process that Evaluates Performance Issues
    a. "Root Cause Analysis"
8. Job Aids
    a. Procedures/Placards Color Coding
    b. Visual Control
9. Assessment/Evaluating/Testing

The assessment approach can be very formal and require a team of individuals or it can be informal and implemented by the supervisor him or herself. The supervisor should be mindful of critical activities and critical facility assets. We have to remember that an 'army of one' can in fact only do so much. So, make sure to target that which is causing the greatest number of (performance) issues.

Performance issues need to be analyzed to determine cost or other categories including asset criticality. This type of information can be obtained from production and computerized maintenance management system data. The graph below illustrates how the major losses impact business performance. The day starts with the operator starting and ramping up the line to operational speed. During the operating day, there are issues with machine reliability, raw material quality, operator error which prevent the machine from achieving the target overall equipment



effectiveness, OEE. At one point, an unplanned failure, shutdowns the machine losing valuable production time. These interruptions cause the line to operate longer to produce a specific product before the line is changed over to another product. The area between the two curves is lost or wasted capacity. A skills improvement process must be able to identify those issues caused by lack of knowledge or skills so a plan can be developed and executed to prevent future losses.

Assessments are typically conducted by reviewing all types of data, performing interviews, observing performance first hand, inspecting equipment, inspecting the final product, and so on. A report should be prepared that focuses on major findings and recommendations that will rectify the issue. Keep in mind that this will need to be 'sold' to a member of management, in this case the Vice President, so the recommendations need to define a Return of Investment (ROI). Listed below are typical results that one may expect to encounter at any number of manufacturing facilities.

1.0 Standard Work Instructions do not exist for Lines X and Y. Line Z SWI has an appropriate amount of detail but is not used or referred to by either Operations or Maintenance.

1.1 PM procedures do not exist for Lines Z and Y.

A. Cleaning
B. Adjustments
C. Operator Inspections
D. Lubrication
E. Operator Inspections
F. Maintenance PM
G. Maintenance Correct Maintenance Job Plans
H. Maintenance PdM Procedures

1.2 Line X PM procedures and practices are acceptable.

1.2 PdM procedures have not been developed for any line.

2.0 Line Z raw material conveyor is experiencing multiple performance issues on a chronic basis. A root cause analysis should be performed to determine if the issues are the result of poor training, line design, equipment deficiencies, poor maintenance practices, poor operating practices or raw material issues.

3.0 Core skill training has not been defined for the job of Operating and Line Technician.

- Perform Job Task Analysis for each position.
- Tasks examples include:
  - Install bearings
  - Install and balance shafts
  - Lubricate bearings
  - Splice conveyor belts
  - Adjust conveyor belt friction and drag

4.0 Equipment specific training needs to be developed based on Standard Work Instructions

- Lock out Tag out information
- Specific control screens
- Input to output process flow
- Special Technology
- Operating instructions to not overfeed the raw material belt.

5.0 Training Curriculum needs to be Select for each Job. A supervisor will need help in selecting the curriculum. Curriculum development is dependent on financing, time frame and available resources. With training, testing and assessments need to be used to ensure that trainees acquire the requisite skills and knowledge. Given plant dynamics and the availability of computers with a strong network, training topics should be web-based and supplemented with subsequent OJT.

6.0 Technical trainers have not been formally training and qualify to implement OJT for Line Z.

7.0 The Training Program has not had a thorough Job Performance audit in over two years. Remember that for training to be considered effective, a difference in performance must be realized. A lean organization cannot spend valuable limited resources on training that has no significant impact.

8.0 Job Aids have not been develop or place on Line Y. These include Evacuation Routes, Exclusion Barriers, and Quality Standards for Product 99.

KNOWING WHAT TO ATTACK FIRST and IMPLEMENTING THE APPROACH

At this point, a bunch of data has been evaluated, a report prepared, and recommendations made. Now what? No doubt you've got a budget to work with OR you're going to use this data to justify additional funding or a new FY budget altogether. In any event, the budget will drive what you need to accomplish. Given that a limited budget is at your disposal, where does one put the money and effort? By now, this will probably seem like a pretty large elephant and YES, you can eat the elephant, just one bite at a time. So you need to …PRIORITIZE.

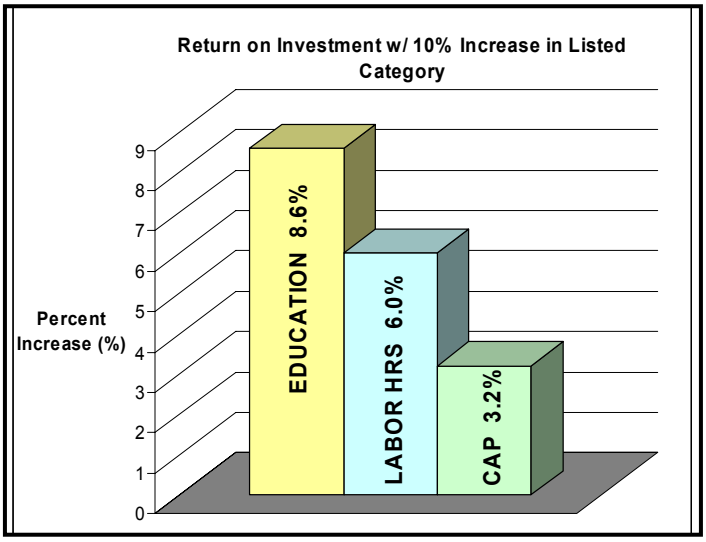
Here's a relatively easy approach to prioritizing. Use an importance scale of 1 to 3 where 1 is the most important and 3 the least. Assign a scale to each of the following factors. As you review the action items that have spawned from your needs analysis, this sort of approach can help you develop an approach that will allow you to address your needs with a logical, practical approach.

- Safety
- Cost
- Regulatory consideration
- Product quality
- Asset reliability
- Management Directive

Once your needs have been prioritized, develop an implementation plan and stick to!

MANAGEMENTS ROLE

SUPPORT!!! In a word, management must provide support.



Management only has to manage three things: financial (investment), skills and knowledge (workforce) and existing asset performance (productivity). Progressive companies keep a balance in all three and their managers understand that skills and knowledge is a prerequisite for productivity. These companies generally have a structured training program which employees participate in and understand.

The business case for this investment can be defined by the resulting improvements in capacity, unplanned downtime, quality defects and workforce efficiency. The key to developing the business case is prioritizing the impact on the bottom line. The focus needs to be on improving performance and by determining what performance gaps are due to skills and knowledge deficiency. The business case of training and investment is similar to a business case for Predictive Technology. If I invest in predictive technology to get early detection of a failure and then do not have the support processes in place to make the repair in a timely fashion, there is no savings because maintenance is still reactive. If the resources are provided to make effective repairs in a timely fashion, a tremendous savings occur and are tracked as saves and relates to maintenance cost, unplanned downtime, quality defects and yield losses. Similarly, when focused technical training is provided, applied and emphasized at the plant floor, business performance improves because unplanned downtime, quality defects and yield losses are prevented.

If a company is to retain or grow it's productivity and achieve a higher level of proficiency and productivity, management must work closely with and enable their supervisors.

CONCLUSION

The skills gap is not getting smaller but larger. As asset management professional's we have to adjust to the changing workforce to provide a workforce which can retain jobs, create next generation's future and compete globally. Our choices are to be a victim of the changing times or to find innovative ways to accomplish the development of a highly productive work force. Training departments and funding are not coming back in the near future. School system and politics social bias is not changing soon. Job responsibilities are not decreasing but increasing. Global competition is here to stay. Let's make the choice to do what we can to eliminate those failures due to procedure, skills and execution.

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