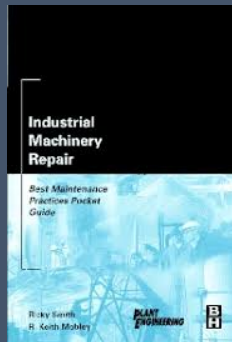


HOW TO DEVELOP AND IMPLEMENT A SUCCESSFUL MAINTENANCE SKILLS TRAINING PROGRAM



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Maintenance Skills Training for industry is a hot subject right now. In many areas of the country, companies are competing for skilled maintenance personnel. Tammy Bodack, formerly with Charlotte's Central Piedmont Community College stated that the city's total unemployment rate is less than 2% and the skilled unemployment rate is lower than that.

The skill level of the maintenance personnel in most companies is well below what industry would say is acceptable. Technical Training Corporation has assessed the skill level of thousands of maintenance personnel in the U.S. and Canada and found 80% of the people assessed scored less than 50% of where they need to be in the basic technical skills to perform their jobs. The literacy level of maintenance personnel is also a problem. In some areas of the United States we find that up to 40% of maintenance personnel in a plant are reading below the eighth grade level. After performing the FOG index, we find the reading level for mechanical maintenance personnel should be the twelfth-year level and electrical maintenance personnel the fourteenth year level (associate degree).

The Department of Education funded a survey with the Bureau of Census to determine how training impacts productivity. The results of the survey are as follows:

- Increasing an individual's educational level by 10% increases productivity by 8.6%;
- Increasing an individual's work hours by 10% increases productivity by 6.0.
- Increasing capital stock by 10% increases productivity by 3.2%.

So, what is the answer? A properly developed and implemented maintenance skills assessment and training program is the solution. The training must be focused to give results as quickly as possible but also must meet a plant's long-term goals. We must accept nothing less than a program that works. A company and its personnel must be committed to a maintenance skills training program 100% in order for it to be successful. Companies that have been successful in

maintenance skills training have both monetary commitment and patience from their higher echelons of management.

Maintenance training, developed and implemented properly, can help companies save money, increase product quality, and improve employee morale.

There are concerns that a maintenance training program may be successful only from a training perspective and not actually cause the changes needed in the plant. Skill increases that are not utilized properly will result in no changes. Once an individual is trained in a skill, he must be provided with the time and tools to perform this skill and must be held accountable for his actions.

MAINTENANCE SKILLS FACTS

Let us face the facts about Maintenance Skills:

1. Most companies do not have fully skilled maintenance personnel.
2. You cannot fire everyone that is incompetent.
3. Hiring skilled maintenance personnel is difficult.
4. Most repetitious equipment problems that cost companies billions of dollars a year are a direct result of skill deficiencies.
5. A person that feels competent is a better worker and is motivated easier.
6. Often maintenance personnel are disciplined because of skill deficiency, not because of a lack of concern or commitment.
7. People become frustrated or stressed when they do not know the proper way to do a specific task.
8. Companies spend millions of dollars a year on maintenance training without regard to the results expected from it or without a way of measuring results.

The development and implementation of a maintenance skills training program must be part of a well-developed strategy. First, we must understand that every plant is different in equipment, personnel, social climate, and skill levels. You must also assume nothing.

Now we are ready to begin developing a successful training program. These are the steps to a successful training program:

1. Obtain commitment from plant, production and maintenance management. They must all understand that this process does not provide overnight results. They must also understand that they will have to contribute to the success of the program, such as:
 - Plant Manager: Money spent on the training program (overtime - possibly, labor cost, developmental cost, instructor cost, material cost).
 - Production Manager: Longer down time to repair machines properly.
 - Maintenance Manager: Trying to juggle breakdowns, scheduling work and training with personnel.
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They must also understand the rewards of the program:

- Plant Manager: Decreased downtime, decreased maintenance cost, increased employee morale.
- Production Manager: Increased production uptime and equipment efficiency.
- Maintenance Manager: Reduced breakdowns, less panic, less stress, better employee morale.

Charles Black, who was the Organizational Development and Training manager for Georgia-Pacific's Eastern Wood Products Group. Mr. Black was responsible for including training in over 100 plants. He states that a business need must be identified before beginning to develop a training program in any facility. By a plant manager identifying the business need for a maintenance skills program he/she is then committed to that program.

2. Establish baselines in order to track if the training is successful or not. A baseline must come from an area that has been tracked for a period of at least 12 months in order to be proven as a valid method of tracking progress. The baseline you use should be tracked on a chart and be explained to all maintenance personnel. A change is normally not seen for at least 6 months. The different area baselines that could be established are:

- Maintenance overtime
- Maintenance parts and supply cost
- Downtime or Uptime
- Tracking maintenance hours on preventive maintenance, scheduled maintenance, breakdown maintenance
- Many others

3. Perform a literacy assessment. The literacy level of your maintenance personnel must be determined in order to insure everyone will at least be able to read and comprehend the training program.

Many maintenance managers I have spoken with have stated that they don't care if someone can read, write or perform math very well along as they can do their job. We must look beyond personnel doing their jobs well today. If someone has a literacy issue and we don't help that person resolve it, then they will be headed for failure later in life. As technology changes so will the demands of everyone to read, write and perform mathematics in a maintenance environment.

4. Perform a FOG index. This is one of many ways to determine the reading level of the material a person is reading in order to perform their job. Typically this involves taking samples of the reading material in a specific job and identifying the number of multiple syllable words in a sentence and the length of sentences. This information is needed in order to identify the literacy requirements of a maintenance person's job.
 5. Perform a job task analysis. This identifies exactly what is the skill and knowledge for a specific skill area. The task analysis is performed with the use of the maintenance personnel and validated by management.
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6. Develop a skills assessment. A skills assessment should be based on the critical task in a task analysis. Each skill area should have three components:
 - Written: This identifies the knowledge required for a specific skill.
 - Identification: This area assesses knowledge in specific skill areas.
 - Performance: This area assesses the critical skills required.
 7. Perform a skills assessment. The skills assessment should be performed by assessors who are certified in order to insure validity of the results. You should have an outside agency or a local technical school administer the assessment. This insures that the assessor does not have preconceived notions about what someone knows. An example: During an assessment at a paper mill I was approached by the maintenance manager. He pointed to one of his employees and said, "See that man, he is the dumbest mechanic I have." The results proved otherwise. Out of 250 mechanics he rated as the fifth most skilled.
 8. Identify the curriculum. Management and your trainer should determine the training curriculum based on the results of the assessment. Normally, we look at the average scores of the individuals in each area and begin training in the areas with the lowest averages first.
 9. Review the assessment results. A third party should review the assessment results with each individual privately and confidentially. This person should focus on the strengths a person has and then the areas they need to improve in.
 10. Provide the maintenance personnel with the training plan. This plan should include the following:
 - Training Curriculum
 - Training hours
 - Roles and responsibilities of each person
 - How the training will be delivered. i.e., 10% classroom, 90% hands on
 11. Training should be developed on the task analysis and be competency based.
 12. Anyone not meeting a competency should be given remedial training.
 13. Personnel should be held accountable to use their developed learned skills to the competency identified.

Training Formats / How do we get the training we want?

1. Technical Schools and Colleges: Technical Schools and Colleges are good resources to provide the maintenance skills training required. A company must insure that a school or college provides them with the training they need and how they want the training provided. Technical Schools and Colleges many times have funding available either from their state agency or through government grants. The key to success in this program is that the company must be fully responsible and accountable for the training. Do not expect the school or college to be fully

responsible for the success or failure of a maintenance training program. Two real life examples are shown below:

Company A: Company A asked their local Technical College to provide them with a maintenance training program. The Technical College agreed that they could provide the maintenance skills training and that their state agency would fund the program. Everything looked great to the plant manager. The only requirement from him was to provide the time for his maintenance personnel to attend the training programs. The Technical College began training and thought everything was going well until the plant manager decided he wanted to attend a training session. He attended the final class on Dial Indicator Coupling Alignment. The next week the plant manager noticed two mechanics aligning an electric motor and saw they were not performing the alignment as they were trained. He became very upset and canceled the training program with the Technical College citing they did not train his personnel adequately. The actual problem we found later was that the college trained the mechanics on a procedure that the plant did not have the tools to perform properly. The maintenance supervisor also told his mechanics when they returned from class to forget what they learned in class and just perform the coupling alignment as he had shown them. This is a typical situation that happens many times each year all over the United States. A company must be involved in the development of a maintenance training program and become involved in how a subject is taught, what is taught, and make sure it is taught to the requirements of their equipment.

Company B: Russell Vandiver, former Vice-President of Economic Development at Lanier Technical Institute in Gainesville, Georgia, was asked by a company to provide maintenance training to their mechanics. Mr. Vandiver asked the company exactly what the expected outcome of a maintenance training program was. They stated they wanted a training program to upgrade the skill level of their personnel. Following this guidance Mr. Vandiver first obtained the commitment of management to proceed with the training development and implementation. Next, he had his staff perform a job task analysis. Mr. Vandiver's staff then modified a maintenance skills assessment developed by the State of Georgia. A maintenance assessment was performed to assess the knowledge and skill level of the maintenance mechanics. The results of the skills assessment was then reviewed with management and a training curriculum was developed based on the needs identified. Next, the assessment results were reviewed with each mechanic stating their strengths and areas needing improvement. The training established was based on the curriculum and the training was performance based with the plant's equipment and problems in mind. The company frequently reviewed with Russell the task and competencies each person would be trained in, how the training would be given and any specific equipment the company wanted to emphasize in this training. This training program grew as more and more companies heard about the program. This is a successful program because not only was the Technical Institute committed to providing quality training, but also the companies were involved in the training at all times. I was the staff person who worked for Mr. Vandiver that developed and implemented this program. He taught me that a company must be held accountable for their own training along with the training provider. We learned that by developing and implementing training properly you can be successful.

2. Contract Training: Hiring a training firm to provide a company with the maintenance skills training they need works very well. When reviewing a company to provide maintenance skills training, ask for references and visit a plant where the training has been in place for at least a year. Once you are satisfied with the references of this firm then have them give a proposal explaining:

- How the training would be developed?
- What training format they would use? i.e., Hands on (performance based), Classroom, etc.
- How will they determine the skill and knowledge level of the maintenance person?
- What are their roles and responsibilities in the upgrading of the skill level in this training program?
- How will they deal with personnel that have learning problems?

A company that is dedicated to maintenance skills training should be able to resolve all of the above issues, as they will have the experience and knowledge to implement a very successful training program. Many times a training firm is overlooked because of cost, but the cost of having training implemented wrong is much more costly than paying someone to do it right the first time. The main advantage of a training firm is that they must be successful or they will not be in business very long whereas a college or school does not have to be concerned with this issue. Think of building your own house from the ground up. The smart person hires the most reputable contractor to handle the entire job, then follows the progress all the way through. Most people and companies do not possess the skills to implement their own programs.

3. Vendor Training: There are two types of vendor training. One involves the use of a local vendor to provide free seminars on their product line. This type training can be good for product review and understanding but will not work when looking at upgrading the skill level of your maintenance personnel. This type training is needed because there are products that can be used by maintenance personnel that if they are not utilized properly, serious problems may result. The second type vendor training is provided by equipment manufacturers. This type training is very important to the successful maintenance of any new equipment. The concerns I have are that the maintenance personnel being trained may not have the prerequisite skills to understand the training provided to them. If you plan to use equipment vendor training then someone must identify the prerequisite skills needed to understand how to troubleshoot and maintain a piece of equipment. Next, an equipment vendor must provide the course outline and objectives. This insures that the training will be professional and not something an instructor gives from memory.

4. Workshops: Workshops are good training sources when they are tailored to meet a company's needs. Tailoring a workshop to a specific plant insures that attendees will have a better chance of gaining knowledge and skill from the workshop. Workshops that are not tailored can still be useful if the objectives meet the attendees needs. A person must have the prerequisite knowledge and skill for a specific workshop in order to increase their knowledge and skill in a specific area.

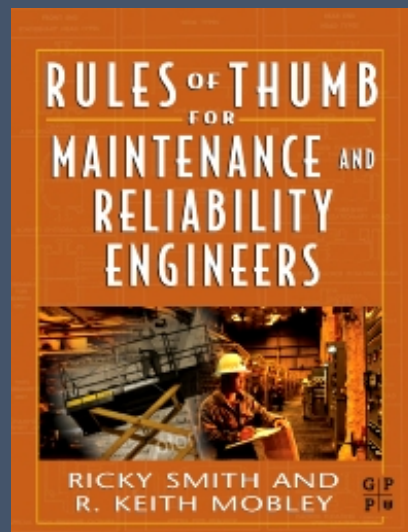
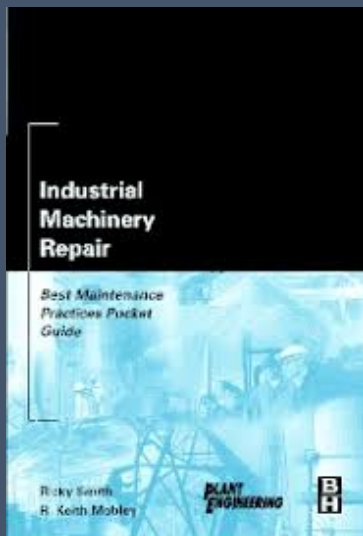
5. Other Methods: There are many other methods a company may use which will provide a successful training program. Some of these methods are peer coaches / training, in-house

training, self instructional, etc. A combination of these programs works very well depending upon a company's specific needs. The thing to remember is that every plant and situation may be different and require a tailored program to meet their needs.

In conclusion, a company that seeks a successful maintenance training program must be committed and understand that to develop and implement a program takes time and money, but the rewards are far beyond the cost associated to them. Always remember a principal of Adult Learning, a person must see or do something 7 to 21 times in order to retain the information.

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