Automotive Parts Industry

Handbook on Participatory Ergonomics

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Table Of Contents

Introduction

WHO IS THIS HANDBOOK FOR?

- Labour and management at medium-size auto parts plants that would like to know more about the participatory ergonomics approach.
- Labour and management that are interested in sustainable solutions to ergonomic problems.
- Labour and management in companies that wish to maximize the value of the ergonomic / health & safety budget.

WHAT WILL YOU FIND IN THIS HANDBOOK?

- Information on the key steps in the participatory ergonomics approach.
- A case study showing the success of the participatory ergonomics approach.
- Examples of ergonomic improvements made in an actual medium-sized auto parts plant.
- Benefits and challenges to the participatory ergonomics approach.

WHAT IS PARTICIPATORY ERGONOMICS?

- Participatory ergonomics is a process of solving ergonomic problems by a cooperation of workers, managers, supervisors, union representatives, engineers, and if needed, outside expertise.

WHAT IS THE PURPOSE OF PARTICIPATORY ERGONOMICS?

- The purpose is to find sustainable solutions to ergonomic problems. Sustainable solutions reduce the risk of injury while maintaining or improving productivity.

WHO IS INVOLVED?

- An Ergonomic Committee is the core of the Participatory Ergonomics Approach. For a business to gain maximum benefit, the committee should include a participant from each in-house skill-group. This may include a general manager, an operations manager, human resources, health & safety, engineering, operations workers, maintenance department, information technology, etc.
- Ultimately, the Ergonomic Committee benefits from the collective experience and expertise of all its members.

WHY INVOLVE WORKERS?

- Worker involvement in the Participatory Ergonomics Approach is very important. The Ergonomic Committee will include worker members who remain a constant part of the team. Other workers will also participate but on a short-term basis when their job or work area is the focus of the Ergonomic Committee's efforts.
- Worker involvement will provide valuable insight into the issues surrounding a job and potential improvements.
- Worker involvement will increase the likelihood of acceptance of any beneficial ergonomic changes.

WHAT DOES THE ERGONOMIC COMMITTEE DO?

- Simply put, the Ergonomic Committee focuses on identifying potential risk factors for injury. They investigate tasks, jobs, workstations, and work areas for practical ways to reduce or eliminate the ergonomic risk for injury.

HOW MUCH TIME WILL WE NEED?

- An Ergonomic Committee does not require a large time commitment to have a positive impact. A commitment to meet once or twice a month is all that is needed. During these meetings, ergonomic issues with be discussed, along with solutions and plans of action. Members will be assigned tasks to be completed between meetings.

HOW MUCH WILL THIS COST?

- The real question should be: how much will it continue to cost if nothing is done? Evaluating the cost of not implementing an improvement compared to the cost of the improvement may offer valuable insight into the program's value.
- Ergonomic changes do not necessarily require a large budget. In-house solutions and modification of existing equipment can help keep the costs down.

WHAT OTHER BENEFITS CAN WE EXPECT?

- A participatory approach typically improves communication and the transfer of knowledge between labour and management. The sense of teamwork can have the effect of improving the morale for the facility as a whole.
- It is not unusual to experience productivity improvements as a result of ergonomic improvements to tasks and workstations.

The Participatory Ergonomics Approach

Step 1: Choosing Success

A strong commitment from management is necessary to create a sustainable participatory ergonomics approach. The success of this participatory approach will be directly related to the strength of management's commitment.

Once a commitment is made by management, the initiative must be communicated to the rest of the workforce. A general plant meeting is an excellent opportunity to announce the initiative along with a newsletter that is handed out prior to the meeting.

It is important that the workforce sees a value in participating in such an ergonomics approach. Skepticism may exist in the workforce that the initiative is just another exercise in "more talk and less action". For this very reason, management must be committed to creating an initiative that is committed to action and results.

Management will define the resources available to the committee. This will include the time set aside for meetings and committee activities, material and financial resources for actual changes, and access to people with specific expertise within the company.

A successful initiative will recognize that the workers are the experts at their jobs and that they can provide valuable insight into problems and solutions for the workplace.

Step 2: Picking A Winning Team

The core of the participatory ergonomics approach is the Ergonomic Committee. The ergonomic committee is tasked with:

- Maintaining communication with the rest of the workforce.
- Identifying areas for improvement.
- Overseeing the necessary changes to these areas.

Potential members must be able to meet at a minimum of once a month for approximately 2-3 hours. Very few individuals in an organization would have difficulty in satisfying this precondition.

At times, the members may need to meet more often to continue the momentum when ergonomic improvements are being put into service and fine-tuned based on worker (end user) feedback.

The Ergonomic Committee must include:

- Management (Supervisors, Human Resources, Company Health & Safety Specialists)
- Interested Workers
- Union representatives
- End users (These workers would temporarily join the committee during discussions involving their jobs)

For maximum performance, also include:

- Engineering
- Maintenance

A key player in the Ergonomic Committee will be an individual from management with a good relationship with the workforce. This person will establish a two-way information flow between management and the workers.

An effective committee will be a blend of those with enthusiasm for the initiative and those with the authority to make things happen. The size of the committee will vary depending on the plant's size and needs.

The Ergonomic Committee will be action oriented. It will set deadlines for key activities and ergonomic improvements, and it will assign people to be accountable for meeting these deadlines.

Step 3: Team Training

It's time to train the Ergonomic Committee.

Like many workplaces in Ontario, a company Ergonomist may not be available to provide the committee with training. The following is a list of training options to consider:

- The Association of Canadian Ergonomists (www.ace-ergocanada.ca) is a contact point for professional ergonomic consultants in your area.
- The Ontario Workplace Safety & Insurance Board has partnerships with a number of Health & Safety Associations that provide ergonomic training (www.wsib.on.ca).
- Your Union or Workplace may have access to an ergonomist or an ergonomic training program.
- Contact a local university or college for the availability of ergonomic services.
- Contact a local university or college for possible access to senior level students in an ergonomic program.

Team Training should cover the following topics:

- Framework of the Participatory Ergonomics Approach
- Principles and concepts in ergonomics
- Identifying and analyzing ergonomic risk factors
- Ergonomic evaluation tools (i.e. OHSCO's MSD Prevention Toolbox – please refer to the Bibliography for more information on this document)
- Record keeping
- Follow up process

Step 4: Targeting Problems

Three common ways of identifying ergonomic problems are as follows:

- Review the company's records (i.e. lost time injuries, insurance claims, etc) to identify patterns of injury.
- Use worksite analysis tools to identify high-risk tasks and jobs.
- Meet directly with workers to discuss any concerns and/or place a suggestion box in the plant for workers to add any ergonomic concerns.

For most workplaces, it is recommended that the ergonomic committee start with a review of the company's injury records. Those jobs where workers have already been injured will get the most attention with this method of identifying ergonomic problems.

Attempt to prioritize jobs, starting with the highest frequency and/or severity of injuries and ending with the lowest ratings.

Typically, an ergonomic committee would use all 3 approaches at some point. Using more than one approach will help the committee dig deeper into the root causes of a problem job.

Remember to document the process of prioritizing jobs - this includes keeping rough notes, calculations, etc. At some point, concerns may arise why some work areas have received improvements and others are still waiting. Being able to show the logical approach to prioritize work areas will help to deal with these concerns and increase the committee's credibility.

Step 5: Brainstorming Solutions

Now is the time to make sure engineering and maintenance staff is at the table. Their active participation is critical for the committee to be productive.

The problem has been identified and now it is time to develop and reshape solutions. It is critical that all members have a chance to add ideas and opinions. This is where a good chairperson can make a positive impact.

A good chairperson will help the group to challenge barriers to solutions and limit discussions that continue to repeat themselves.

Finding sustainable solutions are best. This means the root cause of the problem has been eliminated or significantly reduced. Sustainable solutions are not necessarily expensive or impractical.

Remember to document the ideas and the opinions expressed about each solution. This will save time if an idea must be put to the side and revisited in the future. This includes keeping rough notes and sketches.

Step 6: Taking Action

Victory favors the action takers! Assign work to the people who can get things done. The unexpected benefits and problems of any solution will only show up once the project moves from the conference table to the worktable. Be prepared to move back to STEP 5, every now and again.

The Ergonomic Committee needs to provide advanced notice to all workers and supervisors who will be affected by a coming change or the testing of a prototype. In addition, a brief description of the change may be placed on the facility's bulletin board as a way of notifying the rest of the workforce.

Step 7: Gathering Feedback

Remember - don't react too quickly to feedback! Time is sometime necessary for a change in the workplace to get an accurate appraisal.

The Ergonomic Committee needs to document worker feedback on the advantages and disadvantages of the change as well as any suggestions for improvement. Taking the time to casually discuss the job with the worker and taking notes of important points is a great way of gathering feedback. A less effective option is to hand out a short survey or to have a suggestion box.

If an ergonomic change or prototype needs to be altered, the Ergonomic Committee should go back to STEP 5 with the feedback they have collected. Steps 5 to 7 may need to be repeated until an acceptable solution is found.

Periodic evaluations of the changes should be conducted to help solve other problems that may arise at a later date as well as provide valuable information for new jobs or workstations.

Case Study

The case study is based on a participatory ergonomics research project that took place in a medium-sized automotive parts manufacturing facility in southern Ontario. The facility manufactures a variety of tubing products that are used to produce vehicle fluid carrying systems - such as brake and fuel lines.

Step 1: Choosing Success

Commitment from management

- The research team, along with the union at the facility, approached local management about the potential benefits of introducing a participatory ergonomics program to the facility.

- At the time, the facility was under pressure to improve its injury record. Local management viewed the research project as an excellent opportunity to bring about this needed change.

- This facility was part of a global business operation that was beginning to consider workplace ergonomics. The global operation management team supported the project and was interested to learn from the local facility's experiences.

Step 2: Picking A Winning Team

The selection process for the Ergonomic Committee involved representatives from human resources, operations, and the union, approaching people that they believed would make a successful team.

The core of the team included:

- Workers (Operations)
- Worker (Maintenance)
- Union representative
- Supervisors
- Manager (Human Resources)
- Manager (Operations)
- Facilitator (Project's Principal Investigator)

When needed, the team also included:

- Manager (General)
- Engineering
- Information Technology
- End users (workers directly affected by a potential change)

The first meeting for the ergonomic committee focused on the structure of meetings and expectations of the team members.

- Overview of the project
- Potential benefits to the business and workers
- Introduction of individual members (i.e. prior ergonomics experience, specialized training, etc.)
- Introduction to the participatory ergonomics approach
- Length and timing of future meetings
- Who would chair the meetings
- How would the agenda be created
- Who would take meeting minutes
- How would the committee communicate between meetings
- Schedule next meeting

The ergonomic committee agreed to meet every 2 weeks. However, it became difficult to maintain this schedule due to production demands and the rotating work shifts of various members. It was decided that a monthly meeting was sustainable. These meetings immediately followed the monthly Joint Health & Safety Committee meetings. The meetings were typically 2 to 3 hours in length.

Step 3: Team Training

The ergonomic committee received training from the Lead Investigator. Training took place over the course of a single day. The training covered the following topics:

- Review of the Participatory Ergonomics Program
- Identifying health outcomes
- Risk factors for injury
- Integrating health outcome and risk factor information
- Concepts in tissue damage
- Musculoskeletal disorders
- Back disorders
- Back biomechanics
- Ergonomic evaluation tools
- Example problems using evaluation tools
- Example ergonomic improvements

Step 4: Targeting Problems

Three methods were used to identify and prioritize ergonomic problems.

- (1st Method) The committee first reviewed the company's injury and insurance claims records for the past 3 years. Incidence and severity rate calculations where performed on the data. Jobs were prioritized based on this information.

- (2nd Method) Next, the ergonomic committee examined the data collected from an observational analysis done for each job in the facility. A supervisor and an employee at the job under observation did the analysis. It involved completing a checklist with a number of hazard ranking options. Once again, jobs we re prioritized based on this information.

- The ergonomic committee now had two lists of the same jobs prioritized by different methods (i.e. Hazard checklist vs. Injury records). Each list ranked the jobs differently, but some similarities were apparent. After discussions, the committee was able to reach a consensus on a final prioritized list of jobs.

- Two of the 3 most hazardous jobs existed on the same production line. As a result, the committee decided that the entire line should be investigated and improvements made where possible and practical.

- (3rd Method) On several occasions the committee went to the production line to observe how tasks were performed. Committee members met directly with the workers to discuss any concerns and obtained further insight to the problem situations.

Step 5: Brainstorming Solutions

The ergonomic committee now made sure that engineering and maintenance people were at the table. Engineering staff were crucial in evaluating the costs associated with various proposals.

The committee stayed focused on finding solutions that would be sustainable. This meant that the change had to result in safer work, regardless of who was performing the task. This condition effectively eliminated several options that relied more on individual work technique as opposed to engineering changes.

Finally, four significant ergonomic improvements were developed for the problematic production line. It was a very challenging process. The solutions were not readily apparent and the process required many team meetings and visits to the work areas.

All four solutions satisfied the committee's requirement that an improvement address the root of a problem and the solution must make the work safer for any worker performing the task.

Step 6: Taking Action

It was now time to begin implementing and refining the 4 improvements selected by the Ergonomic Committee for the production line that was linked with the top ergonomic issues.

This particular production line would receive coils of tubing from other areas of the facility. The coils of tubing would be unwrapped and fed into a process that would apply a rubber-like protective coating to the tubing. After exiting the process, the tubing would again be wrapped into a coil and prepared for shipping to customers. Customers would use the tubing as the raw material for various fluid containing systems in vehicles, such as fuel and brake systems.

Unexpected problems did show up with several of the improvements and the team went back to STEP 5 on a number of occasions. Eventually, all 4 improvements proved successful.

Example 1: Stand Adjustment

As a coil unwinds, the tubing is directed into the production line by a series of guides (see Figure 1a). As a coil empties, the guides must be adjusted vertically to compensate for height changes on the coil.

A main concern of making stand adjustments is the weight of the moveable section that is raised or lowered. In addition, this section must be supported in one hand as the other hand loosens or tightens the release mechanism (see Figures 1b & 1c).

There are 40 of these stands that must be adjusted several times per work shift, creating a concern for injury to the arms, shoulder, and/or back.

The improvement for this task was quite straightforward. It involved the installation of an air cylinder inside a stand's column. This allows the workers to loosen or tighten the release mechanism without the need to support the moveable section of the stand in one hand. The worker can now stand upright when making stand adjustments and use both hands to force the moveable section either up or down.

Figure 1a

Figure 1b

Figure 1c

MATERIAL COSTS: $ 100 per Stand x 40 Stands

LABOUR COSTS: 2 hours per Stand

Example 2: Threading-the-line

Before a coil is run through the production line, the tube from the coil must be manually pushed to the start of the production line. The tubing is pushed through one of several enclosed pipes that range in length from 10 meters to more than 40 meters (Figure 2a).

A main concern with this task of "threading-the-line" is the repetitive shoulder, arm, hand, and back forces needed to push the tubing through the enclosed pipe (Figures 2b, 2c, & 2d). Pipe lengths approaching 40 meters become increasingly more difficult to work with.

Figure 2a

Figure 2b

Figure 2c

Figure 2d

This was a challenging task to improve. Eventually, a mechanical device was created to push the tubing through a pipe. Once the device is setup (Figures 2e & 2f) it requires little more than the push of a button to operate (Figure 2g).

Figure 2e

Figure 2f

Figure 2g

MATERIAL COSTS: $ 1000 for the prototype
LABOUR COSTS: 80 hours of work

The device operates on compressed air that was already available in the area. The device is portable and is connected to any of the pipes when the need to push the tubing is required. The device has effectively reduced the repetitive and forceful motions associated with this task.

A concern that still needs to be resolved is the longevity of the device. The inner rollers that push the tubing are prone to wearing out sooner than desired do to the high forces placed upon them.

Example 3: Coil Release

As tubing exits the production line, it is once again wrapped into a coil. When the process is complete the tubing is automatically cut so the coil can be removed (Figure 3a & 3b). However, when the tubing was cut it would often jam in the production line.

Figure 3a

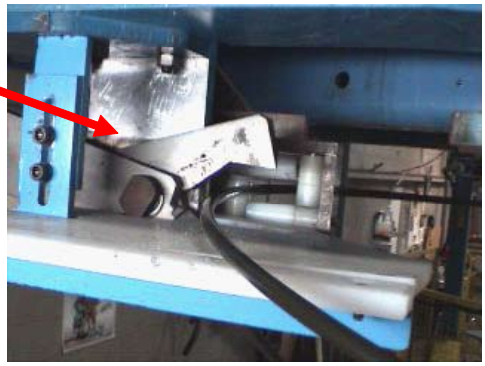

Figure 3b

A worker would need to enter the process area and manually cut away the tubing and remove any jammed pieces. Figures 3c & 3d show a worker using the snips to cut away some heavier gauge tubing. The forceful overhead motions put the worker's shoulders and upper back at risk of injury. The worker is also at risk of being lacerated by the tubing. The coiled tubing is under tension and once cut it may spring and lacerations would occasionally occur. Figure 3e shows the worker using an arm to protect his face from the tubing once the cut has been made.

Figure 3c

Figure 3d

Figure 3e

MATERIAL COSTS: $ 0

LABOUR COSTS: 4 hours work

It was discovered that the tube becoming jammed was largely the result of two devices in the production line. The devices were determined to be redundant to the process and were removed. Once removed the automatic cutters functioned more effectively and tube jams reduced by 90-95%. This significantly reduced worker exposure to the ergonomic and laceration hazards.

A total of 10 coiling operations had the problematic devices removed to improve the functioning of the automatic cutters.

Example 4: Coil Compaction

As tubing exits the production line, it is once again wrapped into a coil. To increase the amount of tubing that can be wrapped into a coil, a worker would enter the operation and manually shakedown the coil. This task required repetitive and forceful shoulder and arm motions that were a cause for concern (Figures 4a & 4b).

Figure 4a

Figure 4b

This was a challenging task to improve. It was eventually discovered that the computer program that manages the process could be altered so that the coiling speed could be oscillated to create a more compact wrapping of tube (Figure 4c). This eliminated the need for a worker to enter the production area and manually shakedown the coil. All 10 coiling operations where eventually reprogrammed with the oscillating speed requirements.

Figure 4c

Figure 4d

An unexpected benefit also resulted from this Ergonomic Committee improvement. The automation of the coil compacting task resulted in 20% more tubing being added to each coil (Figure 4d). This resulted in an estimated 20-25% savings in the transportation costs to customers. It also resulted in less coils being handled by the forklift operators on any given work shift, creating more time for them to perform other important tasks.

MATERIAL COSTS: $ 0

LABOUR COSTS: 10 hours work

Step 7: Gathering Feedback

The Ergonomic Committee gathered feedback from workers throughout the entire Participatory Ergonomic Approach described in this case study. Gathering feedback is listed here as STEP 7, but in reality it occur throughout the entire process – from initial investigation, to solution testing, to solution implementation.

Since feedback was gathered throughout the entire improvement process, the Ergonomic Committee received virtually no resistance to the changes described in the case study. The workers were involved and aware of what was occurring so there were no unexpected activities to raise suspicions.

More Workplace Examples

Example 5: Tube Cutting

- Tube ends must be manually cut before being joined together (Figures 5a & 5b).

CONCERNS:

- Repetitive motion.
- Hand force.

IMPROVEMENT:

- Workstation equipped with a powered cutting tool. (Figures 5c & 5d)

BENEFITS:

- Repetitive motion eliminated.
- Task is quickly completed.

MATERIAL COSTS: $ 30

LABOUR COSTS: 1 hour of work

Figure 5a

Figure 5b

Figure 5c

Figure 5d

Example 6: Tube Joining

- A continuous tube must travel through the production line.
- The tubing from different coils must be joined together by a technique called "crimping" (Figures 6a & 6b).

Figure 6a

Figure 6b

CONCERNS:

- Awkward task because the tubes to be joined must be held in one hand until the hand tool is in position to perform the first crimp.
- Repetitive crimping motions with force.

IMPROVEMENT:

- The crimping task was automated.
- The operator holds the tube ends with both hands and activates the crimping machine with a foot-pedal (Figures 6c & 6d).

BENEFITS:

- Improved back posture. Operator tends to stand more upright during task.
- Reduced arm motions and forces.
- Task is quickly completed.
- Low cost improvement.

MATERIAL COSTS:

$ 0 because the machine was obtained from an older operation that was discontinued.

LABOUR COSTS:

4 hours of work

Figure 6c

Figure 6d

Example 7: Transferring a Tube Bundle

- A tube bundle is transferred from the production line to an outside rack for further processing (Figure 7a).

CONCERNS:

- Hangers along the top rail impede the smooth transfer of a tube bundle (Figure 7b).
- Twisting of the back.
- Shoulder & arm force as a tube bundle is lifted over each hanger.

IMPROVEMENT:

- Hangers are removed creating a smooth top rail (Figure 7c & Figure 7d)

BENEFITS:

- Reduced back twisting.
- Reduced shoulder & arm force.
- Task is quicker to complete.
- Task is perceived as easier to complete.

MATERIAL COSTS: $ 0

LABOUR COSTS: 4 hours of work

Figure 7a

Figure 7b

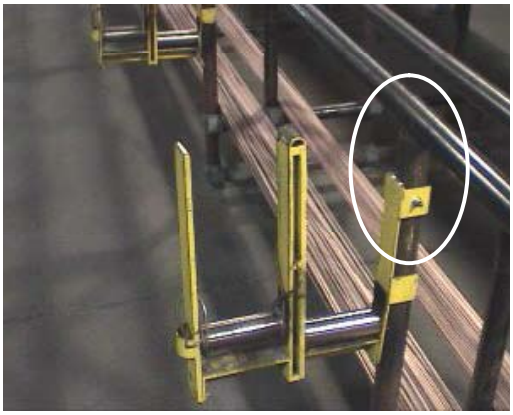

Figure 7c

Figure 7d

Example 8: Torque Gun

- The torque gun is used to secure a coil of flat stock onto a process feed reel.

CONCERNS:

- Sustained force needed to hold the torque gun.
- Operator typically reaches to the side with one arm to lift the torque gun from nearby worktable (Figure 8a).

IMPROVEMENT:

- Torque gun is suspended at working height on a tool balancer (Figure 8b) that is attached to a rail system (Figure 8c).

BENEFITS:

- Sustained force needed to hold the torque gun is eliminated.
- Rail system reduces the hazard associated with reaching for the torque gun.

MATERIAL COSTS: $ 500

LABOUR COSTS: 4 hours of work

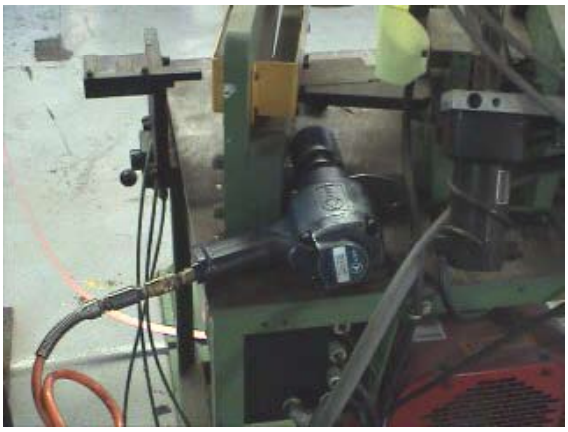

Figure 8a

Figure 8b

Figure 8c

Example 9: Securing a Coil of Flat Stock

- A coil of flat stock is the raw material that is eventually formed into tubing.
- The coil must be secured to a reel that feeds the flat stock to the production line.

Figure 9a

CONCERNS:

- Shoulder & arm force need to turn the hand crank (Figures 9a & 9b).
- Stooped back posture.
- Reduced stability due to elevated foot.

IMPROVEMENT:

- Coil reel was modified so that it may be operated with a torque gun (Figures 9c & 9d).
- Torque gun is connected to a balancer and rail system for easy operation.

Figure 9b

BENEFITS:

- Reduced shoulder and arm forces.
- Improved body posture.

MATERIAL COSTS: $800

LABOUR COSTS: 16 hours of work

Figure 9c

Figure 9d

Task 10: Cutting Samples for Quality Check

- Pieces of tubing must be cut to the appropriate sizes prior to undergoing a variety of quality checks.

CONCERNS:

- Awkward task because the snips are operated with one hand (Figures 10a & 10b).
- Shoulder and arm force need to cut heavier gauge tube with the snips.

IMPROVEMENT:

- Task is fully automated (Figure 10c & 10d).
- Task is no longer awkward and forceful.
- Foot pedal activates cutters.

BENEFITS:

- Shoulder and arm forces significantly reduced.
- Task is quickly completed.

MATERIAL COSTS: $ 150

LABOUR COSTS: 4 hours of work

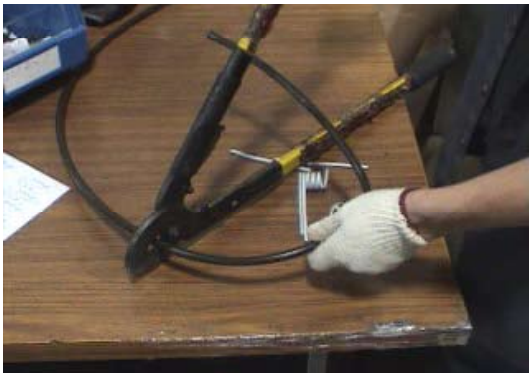

Figure 10a

Figure 10b

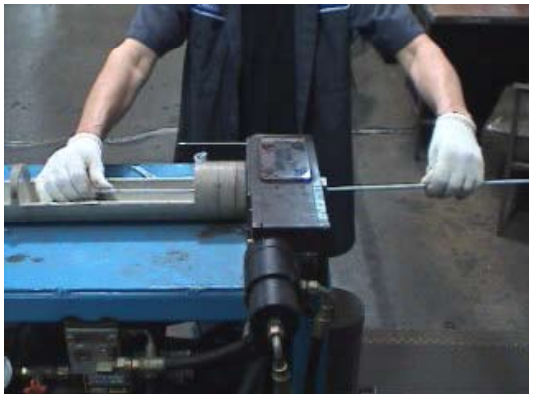

Figure 10c

Figure 10d

Example 11: Tube Quality Check

• A tube sample is coiled to test the adhesive quality of a protective coating.

CONCERNS:

• Shoulder and arm strain associated with manual hand crank (Figure 11a).
• Stooped back posture (Figure 11b).

IMPROVEMENT:

• Electric motor replaces manual hand crank (Figure 11c).
• Push button operation (Figure 11d).

BENEFITS:

• Shoulder and arm strain eliminated.
• Upright back posture.

MATERIAL COSTS: $ 200

LABOUR COSTS: 3 hours of work

Figure 11a

Figure 11b

Figure 11c

Figure 11d

Example 12: Waste Material Transfer

- Solid Impurities in liquid waste is captured in a series of filters. The filters are emptied into a catch bin and this material is shoveled into another bin used for shipping (Figures 12a to 12d).

Figure 12a

CONCERNS:

- Shoulder and arm force.
- Lower / upper back force.
- Skin exposure to harmful materials.

IMPROVEMENT:

- The catch bin has been modified so that it can also serve as the shipping bin (Figures 12e & 12f). This has eliminated the need for shoveling.
- The series of filters have been slightly raised to accommodate the modified catch bin.

Figure 12b

BENEFITS:

- Manual material handling is significantly reduced.
- Likelihood of skin contact with harmful materials has been reduced.

MATERIAL COSTS: $ 1000

LABOUR COSTS: 20 hours of work

Figure 12c

Figure 12d

Figure 12e

Figure 12f

Example 13: Shipping / Receiving

- Forklift operators continually transport good in the shipping / receiving area.

CONCERNS:

- Forklift operators being exposed to whole body vibration due to the very rough driving surface (Figure 13a).

IMPROVEMENT:

- The outside area in shipping / receiving was re-surfaced to create a smooth surface for the operation of the forklifts (Figure 13b).

BENEFITS:

- Reduced whole body vibration exposure for forklift operators.

MATERIAL COSTS: $ 75000

LABOUR COSTS: 4 days of work

Figure 13a

Figure 13b

Final Word

Aside from a reduction in ergonomic hazards, the Participatory Ergonomics Approach produced a number of additional benefits. This included:

- An overall improvement in the functioning of the safety program.
- Fewer recordable injuries.
- Improved morale within the workforce and supervisors.
- Increased employee involvement with ergonomic issues.
- Improved labour relations.

Initiating a Participatory Ergonomics Approach at this facility was not without some challenges. This included:

- Initial skepticism from both workers and management.
- Organizational changes outside the control of the local facility.
- Economic forces that impacted the workforce at this facility. This included layoffs and the permanent shutdown of a production line where a significant amount of the committee's time was spent.
- Time was always an issue for the committee; whether it was the amount of time that individual members could offer the committee, to the amount of time that the committee could expect from other people tasked with making changes. This resulted in the committee often setting unrealistic timelines.

In summary, the Participatory Ergonomics Approach produced benefits that far outstripped any challenges faced by the Ergonomic Committee. The fact that this committee is still effectively functioning since the departure of the research team many months ago is a positive indicator of the value this initiative has brought to this workplace.

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