LEAN SAFETY

Transforming Your Safety Culture With Lean Safety Management

Robert Pemberton

Lean Safety: Transforming Your Safety Culture With Lean Safety Management

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Published by Robert Pemberton, 2018.

LEAN SAFETY: TRANSFORMING YOUR SAFETY CULTURE WITH LEAN SAFETY MANAGEMENT

First edition. April 6, 2018.

ISBN: 978-1386121336

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“People don’t care about how much you know about safety until they know how much you care about safety” – anonymous tip for Leaders.

“Attitude is a little thing that can make a big difference” – Winston Churchill

Introduction

ONE OF THE KEY TAKEAWAYS from this book is about how you and everyone in your organization should be thinking about safety. The way we want you to think about safety is to imagine your own teenage daughter or teenage son is about to start work at a new construction site. You would most likely be very concerned about what safeguards you would want to have in place to ensure their safety; Safeguards such as adequate training, safety barriers, personal protective equipment (PPE) and so on. This is the way we should think about safety whenever we send a worker out to work on a job. We want them to return home safely to their loved ones at the end of each shift.

But that doesn't mean we should wrap them in cotton wool, otherwise when conditions change, they won't have the knowledge to be able to deal with a different set of hazards. This is why it's important to teach them to use their brains to identify the hazards and exposures in the workplace, and to check that the right controls are in place and are effective. If the controls are not in place then they should have the confidence to know they have the power to stop the job and raise the matter with their supervisor. There is no job that can't be done safely. It just needs the right attitude and the right mindset by everyone on the job. People need to be able to make decisions about matter which affect their safety. Not just their own safety, but the safety of their colleagues as well. One of the key values is to look out for your mates. This value, this attitude or set of behaviours comes from having the right culture in place and the means to support it and make it sustainable.

In this book, we make mention of both safety and production because they are inextricably linked. Gone are the days when safety and production were a dichotomy where production was always king. Improving safety performance will reduce costs and improve your bottom line. Improvements in both safety and production both derive from the same basic principles of focusing on the process and generating ideas for improvement with the involvement of workers.

The safety principles outlined in this book are universal safety principles which should apply in your country, irrespective of the specific safety legislation implemented in your country.

Why Focus on Safety?

ACCORDING TO CURRENT statistics the annual cost of injuries globally is in the billions of dollars. In the USA, UK and Australia, a workplace injury occurs approximately every 3 minutes. This is a staggering statistic. Not only does it result in loss of productivity, profit, it results in people being killed or injured, which impacts not only them but their family and friends. In addition, now days, a company's reputation is on the line if it seriously injuries or kills a worker. New and existing safety legislation has severe penalties for business owners and management who neglect to maintain a safe workplace, including heavy fines for individuals and companies and even jail terms.

Why Focus on Lean?

THE TERM LEAN CAME from the need to eliminate waste in production processes. If you eliminate waste you become Lean. But Safety also benefits from the Lean approach. This is because waste in safety consists of things like Lost Time Injuries, downtime due to equipment damage, people taking time off from work because they are fatigued or people receiving injuries from strains (sometime repetitive strains) and sprains because of poor safety practices. The techniques outlined in the section on Lean Tools for Safety will help you build a Lean, Safer workplace.

Leadership

LEADERSHIP HAS NEVER been so important as it is now, in terms of creating a strong safety culture. It's no longer adequate for leaders to simply **commit** to safety, they also need to be **involved** in safety.

Let's contrast two leaders Bob (a strong leader) and Bane (a poor leader). The examples are based on actual real life scenarios, but we have changed the names to protect the guilty.

Workers hardly ever see Bane. He sits in a closed office high above the factory floor. The few workers who have tried to approach him with issues are usually dismissed fairly quickly. He rarely talks to workers or goes out onto the factory floor to interact with them. The morale in the factory is low and the safety record is poor, but Bane doesn't care, so long as he meets his production targets.

Bob on the other hand, has an open door office on the factory floor alongside his workers. Each morning at 7am he attends the pre-shift meeting where safety and production issues are raised.

His workers can approach him at any time, even just walk in to his office. He listens and cares about their concerns, and establishes teams to generate ideas to improve safety and production. During the shift, he walks around the factory floor, interacting and engaging with workers. He helps observe unsafe or at-risk behaviours and discusses with workers how they might improve their safety. His workers often remark how inspiring and caring he is.

Qualities of strong leaders:

- Visible
- Approachable
- Caring
- Interactive
- Inspiring

- Involved
- Engaging
- Lifts morale

Improving your Safety Culture

HOW DO WE CHANGE THE safety culture? It starts with you as a leader. You can influence the people around you. A difference between a good day and bad day is the level of interaction we have with those around us. Come to work with a positive attitude and lead by example. If you see someone having a bad day, you can be a positive influence and lift them up. Do this and you will find it will come back in spades.

What does it mean to have a great safety culture? One definition of culture is a set of shared beliefs, attitudes, behaviours and values within the organization. These may include the following safety related values:

- Safety
- Family
- Empowerment
- Engagement
- Encouragement
- Reward
- Enthusiasm
- Integrity
- Determination
- Generate Ideas
- Stretch Targets

Let's look at each of those values in more detail.

Safety

SAFETY SHOULD ALWAYS be the number one value in an organization. Above everything else we want employees and contractors to go home safely to their loved ones at the end of each shift. Injuring or hurting people is never acceptable and production can never be worthwhile if we are hurting people in the process. Employees need to be taught firstly to always

look out for the hazards in their area and the things that could hurt them. Secondly to make sure the right controls are in place and thirdly to ensure the controls are working and effective. Workers should also look out for the safety or their work mates, and never be afraid to stop the job and contact their supervisor if they feel unsafe. The Safety Value is also where we not only look after our own safety, but we also look out for our brothers and sisters who are working with and around us. We become “My brother’s and sister’s keeper”. If we see them doing something which is unsafe, or they haven’t put the required controls in place then we gently pull them up and remind them to do the job safely.

Family

A FAMILY CARES FOR one another. So should we as members of our organizational family. We should think about the whole business when making decisions, not just the area we work in. We should avoid working in “Silos”. When we make commitments we should be all committed as one. A strong team is a team united, otherwise divided we fall. We need to always make sure the right hand knows what the left hand is doing. Open and transparent communication is paramount to success and to keep the rumour mill under control. There should be “no secrets”. We should also celebrate successes. That is what families do.

Empowerment

ONE OF THE THINGS EMPOWERMENT means is that each and every employee or contractor is given the right to stop the job if they feel it is unsafe to continue. But it also means a lot more than that. It means employees are given the right to make their own decisions and become autonomous in some respects. They are given the training and tools to come up with ideas and improvements to their work areas. They have the ability to act in the best interests of the business.

Engagement

THIS IS ONE OF THE most important safety values. It means involving workers in matters which affect their safety, through consultation, communication, collaboration, involvement in decision making, and building trust. When we involve workers and gain their trust, they will want to contribute even more because they have taken a team ownership of problems and solutions – the team being workers and management working in synergy. An excellent tool to facilitate engagement is Trello . This tool makes it easy for groups to collaborate on ideas, projects, initiatives and actions.

Encouragement

ENCOURAGEMENT MEANS things like letting someone know they are doing a great job. This simple recognition can greatly boost morale and will "make someone's day" when someone gives them some positive feedback, especially when the feedback comes from someone's boss or from higher up the management tree. Some General Managers and CEO's make a point of calling an employee who has done a great job or has achieved a target, and giving them compliments. The encouragement could also come in the form of an email, certificate or award of some kind. The possibilities are endless.

Some companies encourage employees by offering an annual incentive bonus payment if certain safety, production and cost targets are met.

Reward

CLOSELY TIED IN WITH Encouragement is the idea of Rewards, which are tangible forms of encouragement and could take the form of a simple financial gift, token gift, shares in the company or an annual incentive bonus payment.

Enthusiasm

ENTHUSIASM CAN BE INFECTIOUS if management is enthusiastic and positive. If management are pessimistic and negative then conversely the

workforce will become pessimistic and negative. Management's attitude "rubs off" on the workforce.

Integrity

INTEGRITY MEANS WE are always honest in our words and actions. We avoid making flippant comments. Workers are always looking at and observing leaders to see how they communicate and what they communicate, and how they behave and act. It's important that leaders do what they said they would do.

Determination

DETERMINATION MEANS "never giving up" until you succeed. You may fail several times along the way, but each time you will learn from those mistakes and move on. Determination means being persistent until success arrives.

Calvin Coolidge said "Nothing in this world can take the place of persistence. Talent will not: nothing is more common than unsuccessful men or women with talent. Genius will not; unrewarded genius is almost a proverb. Education will not: the world is full of educated derelicts. Persistence and determination alone are omnipotent."

Generating Ideas

GENERATING IDEAS COMES from the idea that we should never accept the status quo. There is always a better way of doing something and we should always be on the lookout for them. There are many tools and techniques that can help generate ideas. Among them being:

1. Challenge assumptions.
2. Reword the problem.
3. Think laterally or in reverse.
4. Redefine the problem.

5. Brainstorming.

Stretch Targets

EVERY COMPANY THESE days has targets for safety and production. The idea of Stretch Targets comes from trying to get that little bit extra out of our people, albeit in a safe way. Stretch targets are often linked to a reward or bonus system that pays employees that little bit extra for achieving a stretch target. Stretch targets may typically be an additional 5% or 10% over the normal target. Sometimes companies make their normal targets publicly available on their website, but keep their stretch targets internal. This is a way of helping to ensure they will achieve or exceed their publicly named targets.

Safety Culture Survey

IF YOU HAVE NURTURED an effective safety culture and were to run a safety survey to measure it, you would hopefully generate responses like the following actual comments which were captured from the results of a safety survey of employees and contractors from a Fortune 500 company.

- I have the ability to be able to make a difference. So I'm not just a number.

- Opportunities and career path.
- Being proud to work here, dressed for success.
- Feeling that we can talk to anyone at any level and they will listen and care.
- Management care about my safety.
- Building capability for my team.
- Because we get together in teams and solve problems quickly.
- Being out on the forefront of everything (leading edge) produces a sense of excitement. Employees and contractors are excited to come to work.
- Contractors work together with the company to solve problems (safety, production etc).
- We are a learning organisation. We learn from our incidents, our mistakes so that we can prevent them from happening again.
- Enjoy how dynamic the company is, where employee feels empowered, part of a team, part of the success of the company.

You can easily run a safety survey in your own organisation. A free and powerful tool to do this is Survey Monkey - http://www.surveymonkey.com

The Triple Vision

MOST ORGANISATIONS have a triple vision in their headline vision statement. It might go something similar to this. To be the safest, lowest cost, most profitable producer of widgets in the world.

Everyone in the organization should be aware of this vision. It should be written at the top of the organization's values statement. It should be on the company website. The vison give some common consistency of purpose that everyone in the company strives to achieve, so everyone is on the same page.

The New Triple Bottom Line

IN THE OLD WAY, THE bottom line used to be just about profit. No so any more. As good corporate citizens, the workers, management and the public expect us to report on safety, production and cost. That's the new triple bottom line.

Focus on the things we can control

THERE ARE MANY THINGS in life we cannot control, like the weather, the stock market or the price of commodities that we produce. What we can and should be doing is focussing on those things we can control like our safety performance and the cost of production. If we continue to focus on those things then we can improve our triple bottom line and future-proof ourselves against variability in the market. To reduce the cost of production and realize operating efficiencies we need to focus on all the individual processes within our areas, starting with the big ticket items which are items with the biggest opportunities for cost savings. And if one of our team mates has a problem in another area, there should be nothing stopping us from giving a helping hand in that area of the business.

The Global Cost and Safety Curves

IT'S IMPORTANT FOR the business to sit as far down the global cost and safety curves as possible. This is because the competition out there is also trying to improve their cost and safety position and jump ahead of us on the cost curve.

But as a business continues to drive down its costs, so does its competitors, so a business can never afford to stand still. They should never become complacent and accept the status quo. We can always find ways to do things better and more safely.

The 5 key business drivers for most companies are:

- Safety.
- Production.
- Cost.
- Cash balance.
- Culture.

Remember that one success feeds from one area of the business to another, helping them to be successful too. So we need to focus on:

- Consistency.
- Sharing ideas and successes.
- Planning.
- Quality.
- Sustainability.
- Reliability.

Quality and consistency gives customers the confidence in the products they produce.

Business Drivers - Lean Focus

THE OLD WAY

The old way of driving the business used to be a Top Down approach with results driven and determined by management and external specialists and consultants.

The New way

In the new way, Specific Targeted areas are selected and the results are driven by workers at all levels coming up with new ideas about how to improve both the safety and productivity of key processes. The results are driven by the people.

An example: At a mine site, the biggest cost is typically the Mining process (drilling, blasting, shovels and trucks). Within the Mining process, the biggest cost is usually Trucking, so that is one area a mine site should definitely focus on. We need to be identifying and targeting a select number of high cost areas. Let's engage every one of us to look at the process and come up with ways to improve it both from a production viewpoint and a safety viewpoint.

Let's focus on the key levers of safety, cost and efficiency to continuously improve the business. We can target the low hanging fruit first.

Remember the 3 E's

- Empowerment
- Engagement
- Encouragement

A favorite story we like telling is where the truck crew complained about the surface of the road. Their manager empowered them to engage with the road surfacing crew to decide how many water trucks should run on the

road and how many times it should be graded. This was an example of people working together in a team to solve a problem.

Elements of a Safety Management System

HAVING AN EFFECTIVE Safety Management System in place is essential to ensuring risk of unwanted events such as a fatality or injury is reduced to a minimum.

A Safety Management System is comprised of the Safety Management Elements described below together with its's implementation, management, workers and equipment. The key elements of an effective Safety Management System are:

Safety Policy

THIS SHOULD BE A ONE page statement of the company's commitment to providing a safe workplace and involving workers in matters that affect their safety. It should list the key commitments and should be signed by the head of the company and dated. The policy should be on display in all work areas and on the internal intranet web page.

Governance

MANAGEMENT AT THE HIGHEST levels of the company should be aware of the top ten risks and mitigations of each major division of the company. This is because management are not only accountable for risks but they should be given the opportunity to make informed decisions about risk reduction activities which bring the levels of risk to an acceptable level.

Risk Management Framework

A RISK MANAGEMENT FRAMEWORK should be established detailing the major elements to identify, assess and control risk. The key components of the framework should comprise:

Sometime called 5-Steps, Take 5'sare used to identify and control hazards before you start work and usually comprise the following 5 steps:

1. Stop, look, walk around the task.

2. Think about the task, have a clear plan.

3. Identify and assess hazards that exist or may be created by the task and rate their risk levels.

4. Control the risks and communicate.

5. Do the task if low risk and keep a look out for changes. If the task is medium or high risk, contact your supervisor and discuss how to make the job safe before proceeding with the task.

Job Hazard Analysis (JHA or JSA)

Sometimes called a Job Safety Analysis, a Job Hazard Analysis is created in the absence of a Standard Work Instruction (SWI), for example for a non-routine or one-off task, or when prompted by a risk assessment such as a 5-Step. Other situations may include:

1. A Supervisor, team member, SWI or other process may require a JHA to be completed.
2. Tasks that are non-routine and complex in nature.
3. With the introduction of new equipment, plant or process.
4. If a permit to work is required.
5. If there are changes to the work environment.
6. If there are a number of jobs being carried out in close proximity to one another.

Risk Assessments

Risk Assessments are used when identifying hazards, identifying controls and assessing residual risks associated with a project, site, work area or procedure. The level of residual risk must be accepted by management, or if it is not, additional controls must be put in place to reduce the level of residual risk, if the risk cannot be eliminated or substituted. The Hierarchy

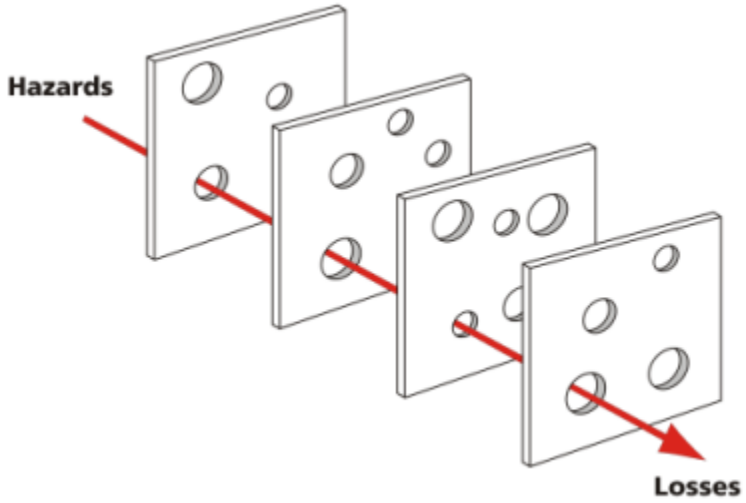
of Controls (HoC) should be followed when deciding upon which controls to implement. The HoC in order of effectiveness are:

1. Elimination.
2. Substitution.
3. Engineering Controls.
4. Administrative Controls.
5. Personal Protective Equipment (PPE).

The first three controls in the HoC are called **hard controls**. The others are termed **soft controls**. Cost is often a factor in selecting appropriate controls because the cost of a hard control is often higher than that of a soft control.

Effective Controls

PROFESSOR JAMES REASON'S famous Swiss Cheese model of safety explains the importance of having more than one control in place, ideally at least three. This means that if one, or even two controls fail, then an unwanted event (injury or loss) caused by a hazard will still be prevented from occurring by the third control.



Standard work instructions (SWI) / procedures

SWI'S AND PROCEDURES are needed for:

1. complicated tasks, so that important steps don't get missed.
2. frequently performed tasks .
3. less routine tasks, if workers need reminders about the hazards and how to control the risks .

Bow Ties

Bow Ties are another tool that can be used when assessing tasks to identify controls to prevent unwanted events. In a Bow Tie the point of Loss of Control (LoC) or Hazardous Event is identified. An example of a LoC is when a motor car goes through a red light.

As shown in the diagram below, Potential cause of Threats are identified along with Control measures designed to prevent the LoC (example: driver training, brakes etc). If the LoC does occur, there are recovery control measures that can be put in place to help reduce the impact of the consequences (eg an air bag).

The Golden Rules

THE GOLDEN RULES (SOME organizations call the Life Saving Choices) are a set of common sense rules which are both easily understood and easy to remember. If everyone followed these Golden Rules, there would be a far fewer number of injuries and fatalities.

- Stay out of the Line of Fire.
- Don't walk under a suspended load.
- Wear your seat belt in a moving vehicle.
- Stop at Stop signs.
- Follow the Isolation procedure.
- Wear fall protection when required.
- Use correct manual handling techniques.

It's worth discussing a few of these in more detail.

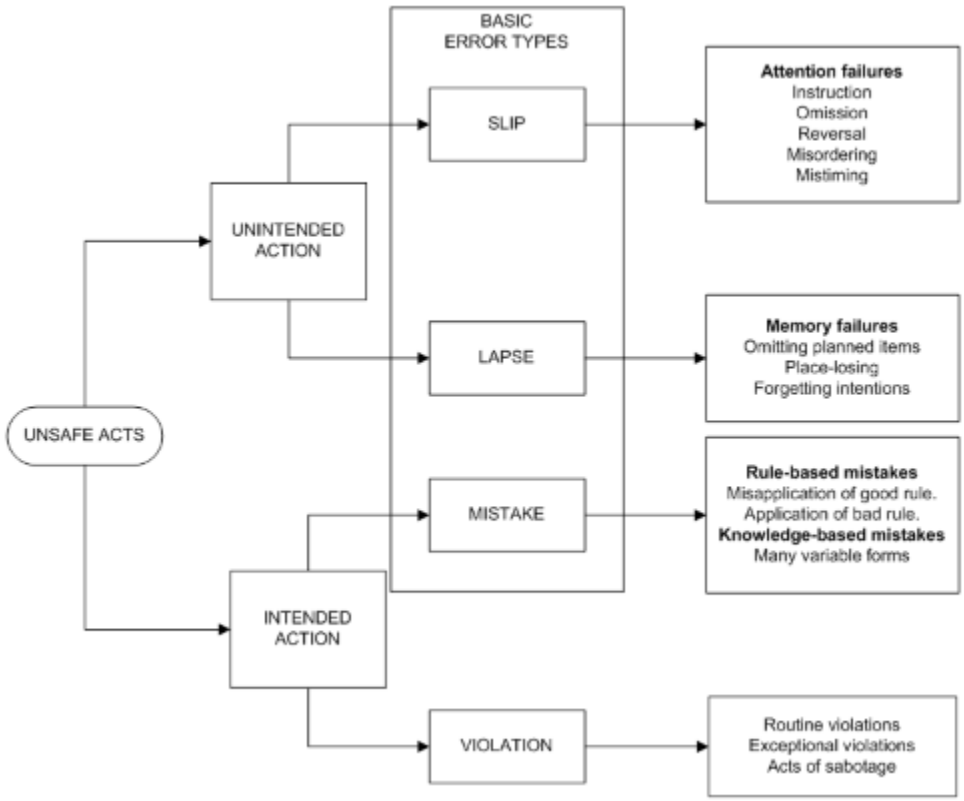
The Line of Fire. 90% of injuries occur because people put their bodies in the so called "Line of Fire". This is the line or direction which released stored energy will travel in if it is released.

Manual handling. Manual handling accounts for the majority of strains and sprains, most often back related, and which relates in a high incidence of workers compensation claims. Educate your workers to use correct

manual handling techniques and not to extend their limbs and body into the so called red zone which represents areas of over exertion which places stress on the back, arms, neck and so on.

Human Factors

THE STUDY OF HUMAN Factors arose from work done by Professor James Reason and others who realised that most humans make errors of some kind during the course of their work (as well as in daily life). The types of errors include “accidental errors” such as slips, lapses or mistakes. The diagram below shows how these types of errors relate to one another and whether they are unintended or intended. The diagram also shows “violations” which may be routine or exceptional.



Injury Management

INJURIES ARE TYPICALLY classified into the following classifications:

1. First Aid Injury (FAI).
2. Medically Treated Injury (MTI).
3. Restricted Work Injury (RWI).
4. Lost Time Injury (LTI).
5. Fatality.

Other classification systems include the following definitions:

Lost workday cases (LWC): If a worker is unable to work on a subsequent scheduled shift because of a work related injury or illness, the case is classified as an LWC. The shift on which the case occurred is not counted as a lost workday.

Restricted workday cases (RWC): An RWC is a case in which a work-related injury or illness prevents the worker from working a complete shift (or from doing any tasks that are part of his or her regularly scheduled job that may be performed or assigned) but which does not result in a lost workday.

Medical treatment cases (MTC): An MTC is a work-related case for which medical treatment is required but that does not result in lost work or work restrictions.

First-aid cases (FAC): A minor injury that calls for simple treatment and does not require follow-up treatment by a health-care professional is an FAC. A case can be classified as an FAC even if a health-care professional administers the first aid.

Near Miss Case (NMC): An event that could have resulted in an injury or fatality is a near miss case.

An injury management procedure would describe how to effectively manage an injured person with a Return to Work Program (RTWP). The RTWP program has several benefits:

1. Gets the person back to work quicker.
2. Reduces Workers Compensation costs.
3. Reduces the chance of re-injury.

Injury Reporting

FROM THE INJURY CLASSIFICATIONS an organization usually reports internally on its Lost Time Injury Frequency Rate (LTIFR) which is defined as:

$$\frac{(\text{Number of LTIs in accounting period}) \times 1\,000\,000}{(\text{TOTAL HOURS WORKED in accounting period})}$$

A Total Recordable Injury Frequency Rate (TRIFR) is defined in a similar way as:

$$\frac{(\text{Number of MTIs+RWIs+LTIs in accounting period}) \times 1\,000\,000}{(\text{TOTAL HOURS WORKED in accounting period})}$$

Safety meetings / forums

SAFETY MEETINGS AND Forums are used to discuss and resolve safety issues and for awareness of safety related matters. For example:

1. Toolbox meetings
2. Department safety meetings
3. Monthly site safety forum.

Workforce Consultation

CONSULTATION MEANS involving workers in decisions which may affect their safety. Involvement is usually through Health and Safety Contacts (Representatives) and Supervisors.

Consultation is usually a requirement of local Acts and Regulations, with an obligation placed on organizations to consult with workers and safety and health contacts or representatives on safety and health at the workplace. To

complement this, workers have a duty to cooperate with their employer on safety and health matters.

Effective consultation involves seeking views on relevant safety and health issues from those at the workplace and engaging in common discussion to achieve accepted outcomes.

The more formal processes for consultation at the workplace set out in the Acts and Regulations and typically consist of:

• Elected safety and health representatives – employees elected by co-workers to represent them in consultation about safety and health matters with the employer. They must be elected according to a process set out in the Acts and Regulations, which also sets out particular functions for them to perform at the workplace, such as liaising with employees on safety and health issues and reporting hazards to the employer.

• Safety and health committees – formal safety and health groups that provide a planned forum for discussion on safety and health matters. They must be set up according to requirements in the Acts and Regulations, which usually also set out particular functions for them to perform at the workplace, such as making recommendations on safety and health matters.

• Issue resolution procedures – the Act and Regulations typically set out a specific process for dealing with safety and health issues at the workplace in a consultative manner and resolving them as they arise. These both require the development of an agreed issue resolution procedure. Where one is not developed, a default procedure must be used, as set out in the Act. Setting up formal processes, involving employers, employees and others at the workplace, is a recognised way of working towards improving safety and health outcomes. Consideration should also be given to less formal workplace arrangements that may assist in meeting the requirement to consult and cooperate with employees on safety and health. For example:

• making safety and health a standing agenda item at workplace meetings, eg on staff, team and/or employee representatives' committee meetings.

• Ensuring safety is discussed at toolbox meetings.

• Implementing email safety bulletins or newsletters to encourage discussion and feedback on issues.

Safety and health representatives and safety and health committees have separate but complementary roles at the workplace. Where both are set up, one of the functions of the safety and health representative is to refer unresolved safety and health issues and/or matters of policy or procedures to the safety and health committee so they can be discussed in a forum.

Safety and health representatives and safety and health committees may:

• Assist employers to meet their obligations to consult employees on safety and health matters, and employees in their duty to co-operate with the employer on these matters;

• Provide planned opportunities for exchange of knowledge, experience and ideas about safety and health between employees, employers or their representatives and other workers;

• Assist in identifying hazards before injury, illness or incident occur and elimination or reduction of their risks;

• Assist in dealing with safety and health matters in an efficient and co-operative manner, ie provide ways of gaining agreement and achieving outcomes generally accepted by all;

• Provide a way of identifying individual safety and health roles and practical safe work procedures;

• Assist with developing an involvement with and commitment to improving safety and health practice;

• Assist in identifying necessary training, supervision, information and instruction; and

• With safety and health committees, assist in the resolution of safety and health issues.

The overall benefit of safety and health contacts and representatives and safety and health committees is that they may provide proactive, systematic

ways for dealing with issues, rather than a reactive approach dealing with issues as they arise.

Document Control

A DOCUMENT CONTROL System is required for safety related documents such as SWI's, Procedures, Policies, Plans and Forms, in order to ensure signoff by authorised persons and version control to ensure personnel are using the current version authorised version.

The Document Control team typically manages a document control system that includes the registration, distribution and maintenance of controlled documents including safety procedures, plans and work instructions. This section also manages the updating and withdrawal of documents consistent with the Safety Management System procedure for Document and Data Control.

The procedure for Document and Data Control should outline the protocol to be observed for updating or revising existing documentation as the result of feedback or structured review. This protocol usually involves issuing documents for review on squad check to authorised officers (including consultation with the workforce), receiving comments back, producing a final document for authorisation. Once the final document is authorised it is made available as the current revision of the document.

Employees authorised to approve safety related documents for issue are required to ensure that their contents are accurate, clear and concise.

Safety related documents should be routinely reviewed and approved for adequacy by authorised officers prior to issue. Wherever possible, documents that require alteration are reviewed and approved by the originating officer, or an officer that has had adequate opportunity to familiarise themselves with pertinent background information.

Controlled documents are allocated an identifying number from a master register. This number and the current revision status are clearly displayed on the document to prevent the use of invalid or obsolete documents. The

master register also records details of the document recipient(s) and the date of issue.

Register of Compliance Obligations and Licenses

THIS REGISTER LISTS compliance obligations as required under applicable legislation. Also contains details of licenses held and renewal dates. The register makes it easy to determine and be reminded of upcoming license renewal dates. As some license underpin a business's license to operate, it can be critical that this register is constantly reviewed and updated to ensure licenses don't expire.

Change Management Process

A CHANGE MANAGEMENT (CM) Process ensures authorised signoff of changes which may impact the safety of the operation. Change Management is also used for stakeholder awareness. The CM is usually underpinned with a Risk Assessment to ensure the proposed change is acceptable. The Current and Proposed change (along with benefits of the change) are usually described along with details such as when the Change is to occur and who the Change Owner is. The Change should then be signed off by all stakeholders before implementation of the change begins. Ideal the change should be reviewed several weeks or months after implementation to review if the change was successful.

Safety Cases

SAFETY CASES ARE REQUIRED for major changes and consist of an overarching document referencing formal FMECA analysis and associated Risk Assessments and Engineering Studies and is used to support Change Advice approvals submitted to the Government.

Contractor Management

A CONTRACTOR MANAGEMENT procedure is required to outline the process for on boarding, mobilizing and managing contractors including

auditing requirements. Most safety legislation these days expects a business to treat contractors as employees when it comes to Duty of Care. Contractors should be engaged just like other employees when it comes to empowering them to look after their safety and abide by the values of the business.

Interface Coordination Plans (ICPs or Interface Agreements)

ICPS ARE REQUIRED TO manage risk identified at the interfaces with the operation such as the other Departments, Land Owners, Public Road owners and Organizations with infrastructure in close proximity to the operation. A typical ICP lists out the risks at the interface (based on a joint risk assessment) and associated controls and agreed procedures to manage those risks.

Standards

APPLICABLE MINIMUM standards such as Safety Management Standards, US, UK or Australian Standards, and Engineering Standards required to help ensure a safe operation. This includes standards for equipment and procedures. Government Safety inspectors will quite often check to see that equipment meets local standards when they come to do their periodic inspections.

Training and competency

TRAINING AND COMPETENCY of workers is required to ensure work is performed in a safe manner thus helping to ensure a Zero Harm environment for employees and contractors. A Training Needs Analysis (TNA) identifies the training requirements for each role in the business. A schedule of upcoming training for each employee should be kept and maintained in a register. Records should be kept when an employee completes their training.

Medicals / Health Assessments

WORKERS ARE REQUIRED to have a current medical applicable to their type of work in accordance with National Standards for Health Assessments, in order to help prevent injuries and fatalities, and to contribute to the Zero Harm environment for employees and contractors. These health assessments may be comprised of a pre-employment medical and/or ongoing periodic refresher medicals.

Drug and Alcohol testing program

WORKERS ARE REQUIRED to undergo periodic Drug and Alcohol tests to ensure they are fit for duty and to help prevent injuries and fatalities, and to contribute to the Zero Harm environment for employees and contractors. Drug and Alcohol testing may also be conducted after an incident or accident, or if an employee or contractor is suspected of being under the influence of Drugs and Alcohol (called For Cause testing). In summary there are three main types of Drug and Alcohol testing:

1. Random testing.
2. Post incident/accident testing.
3. For Cause testing.

Fatigue Management

WORKERS SHOULD BE REQUIRED to participate in the Fatigue Management Program (FMP) to ensure they are fit for duty and to help prevent injuries and fatalities, and to contribute to the Zero Harm environment for employees and contractors.

The FMP should be developed as part of an overall strategy which is designed to ensure that workers are not affected by fatigue. For example there may be departmental rosters in place to define and limit worker hours. One tool which could be used is the FAID system of Fatigue Management. Fatigue Audit InterDyne (FAID) is a computer software program that

computes assessment of an individual's fatigue score. The model allocates fatigue or recovery values to work and break periods based on four factors:

1. The time of day of work and breaks.
2. The duration of work and breaks.
3. Work history in the preceding seven days.
4. The biological limits on recovery sleep.

The worker’s shift start and finish times are entered into the program, and the biological limits in regard to sleep length at specific times of day are accounted for by the program. The program then displays a graph showing when the worker may be potentially fatigued.

A risk assessment should be conducted and an appropriate Fatigue Management Plan, which takes into account the policy and Regulated Working Hours Code, should be developed and endorsed by management.

Emergency Management

THE EMERGENCY MANAGEMENT Plan is designed to ensure a safe operation in the event of an emergency.

Emergency response procedures are maintained at all key locations in the organization. The procedures detail the co-ordination of the emergency response and personnel roles and responsibilities and their interface with external agencies. Procedures for the arrangements with emergency response providers and local resources from other stakeholders which could be mobilised in the event of an emergency are clearly documented and disseminated to these relevant stakeholders as well as being readily available in these organisations.

Risk assessments for emergency conditions are conducted taking into account factors such as the behaviour of people, both workers and the public. Changing conditions in the environment of the operations should also be assessed, such as climatic issues or degraded equipment scenarios.

Regular training and mock runs should be performed to ensure that the emergency procedures for identified emergency events are tested and

familiar to all workers and to verify that the interaction with external parties such as emergency response providers is appropriate.

Effective Supervision

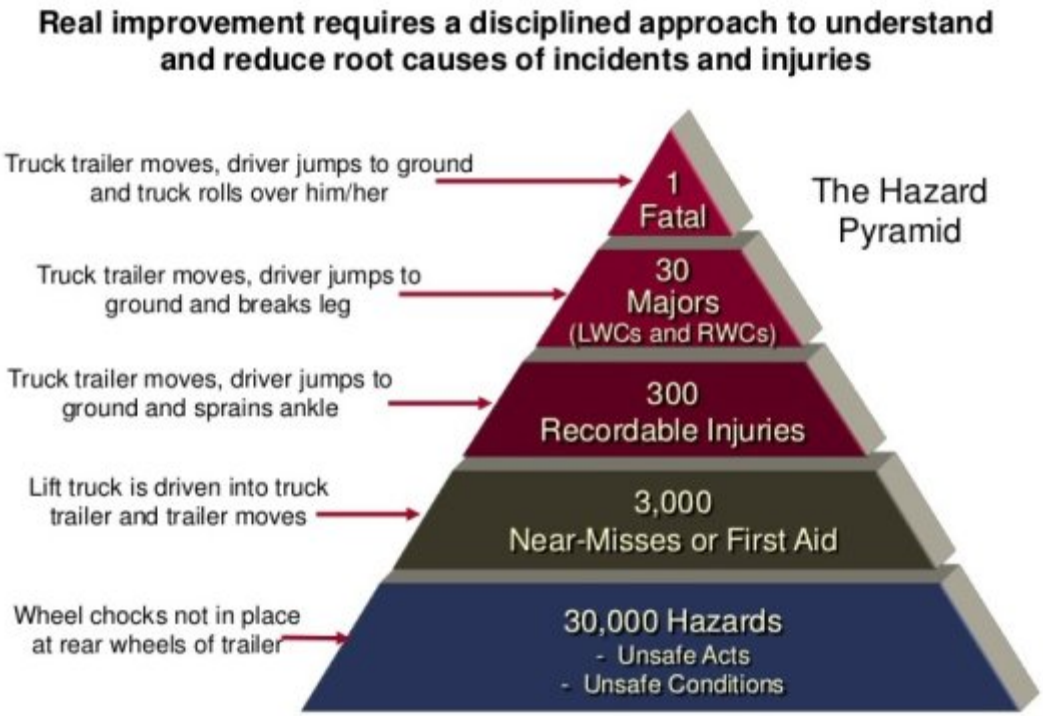
EFFECTIVE SUPERVISION helps ensure a job is done safely. The role of Supervisor is one of the most important in the organisation because they lead people on the shop floor or the coal face which is where most of the hazards exist. They need to set an acceptable standard of behaviour, because as front line leaders, the eyes of the workforce are always on them. Workers are continually looking to their supervisor to gauge the level of accepted behaviour in an organization.

Safety Values

SAFETY IS AN IMPORTANT cultural value. Employees and contractors are encouraged to look out for their own safety and the safety of their brothers and sisters. The values described at the beginning of this book are a sound basis for a values system.

Hazard Reporting

WORKERS SHOULD CONTINUALLY be on the lookout for hazards and eliminate them immediately if it is safe to do so, else report them using the Hazard Reporting system. The importance of reporting hazards is exemplified in the diagram below which shows how hazards can turn into accidents if left unchecked.



Field Leaderships and Safe Act Observations

FIELD LEADERSHIPS (FLs) (sometimes called Safe Act Observations (SAOs)) are used to observe behaviours during tasks including at risk behaviour and positive behaviours and to provide feedback to a worker or workgroup on suggested ways in which they may improve safety in their area.

Why do we do FLs? Imagine an iceberg, of which 20% is above water and 80% is beneath the water. What we see above the water are the hazards and incidents which are reported. What lies beneath the water is what we cannot normally see unless we go looking for it - ie by doing FLs or SAOs. Then we discover at risk activities and have a chance to correct them before they manifest themselves into incidents.

Planned task Observations

PLANNED TASK OBSERVATIONS are used to check that the task being performed aligns with the SWI or procedure and also allows the observer to check for safe behaviours. If there is misalignment, the SWI or procedure should be amended or the workers should be retrained and reassessed in the SWI / procedure.

Fatality Prevention Program

A FATALITY PROTECTION Program (FPP) is used to identify, for each type of work on a worksite:

1. The hazards that can kill people.
2. The Critical Controls required to prevent a fatality.
3. Whether the Critical Controls are effective.

Critical Control Monitoring

CRITICAL CONTROL MONITORING (CCM) is used to monitor whether the critical controls identified in a Fatality Prevention Program are implemented and effective. They take the form of an inspection of the workplace.

Typically, each Manager is tasked with doing a minimum number of CCM inspections per month and these form part of his personal KPI's and are reported on in the weekly and monthly reporting system.

Auditing

AUDITING IS DESIGNED to monitor the compliance to the elements of the Safety Management System (SMS) including those elements required under OSHA requirements.

An Audit Schedule is usually prepared laying out the timing of each audit (typically one per month) and what element of the SMS is to be audited. The Audit Schedule could take the form of a simple spreadsheet. Auditees (usually Department Superintendents or Managers) are usually notified a

month in advance of the scope of audit (ie which element or elements will be audited).

An Audit Tool is then used to ask predefined questions to verify controls such as procedures are in place and workers are aware of the controls. The Audit Tool my take the form of simple spreadsheet. The Audit may involve scoring the auditee's compliance with the SMS element being audited.

After the audit is completed an Audit Report usually prepared with findings and any gaps identified. From the Audit Report a Performance Improvement Plan (PIP) can be developed with Actions assigned to close the identified gaps.

Key Performance Indicators (KPI's)

KEY PERFORMANCE INDICATORS (KPI's) allow management to measure performance against targets and introduce effective counter measures if targets are not being achieved. The KPI's are usually set by managers and cascaded down to each level below. There can be company KPI's, Divisional KPI's, Department KPI's, Section KPI's and Individual KPI's. KPI's are usually reported on in daily Lean Meetings and Monthly Reports. The reporting may take the form of line charts, bar charts, histograms or numbers.

Safety Management System Review

A REVIEW OF THE SMS enables the process of continuous improvement by identifying gaps or areas for improvement and assigning actions to close the gaps. The review also assesses the effectiveness of the SMS based on trends in injuries and accidents etc.

Accident and Incident Investigations

INVESTIGATIONS ARE designed to prevent recurrence of an incident by identifying the root cause and contributing factors and putting corrective actions in place to improve the safety system. It is extremely important to identify the root causes of accidents and incidents in order to prevent

recurrence. A common investigation tool is ICAM (Incident Cause Analysis Method) which involves the development of a People, Environment, Equipment, Procedure, Organisation (PEEPO) chart, a timeline, a determination of the failed defences and contributing factors and the development of recommendations. A small team and trained facilitator are assigned and the evidence is gathered. There are formal ICAM templates available to guide the team through the process.

Appoint a facilitator and establish an investigation team if necessary. Investigation teams should ideally be comprised a Health and Safety Contact or Representative, a trained facilitator and a supervisor or person with experience relevant to the investigation.

Plan and conduct the investigation by collecting all necessary evidence and completing a systematic analysis to establish the underlying root causes.

For the ICAM Analysis identify the contributing factors such as:

1. Absent or failed defences.
2. Individual / team actions.
3. Workplace factors.
4. Human factors.
5. Organisation factors.

Corrective Actions

CORRECTIVE ACTIONS can arise as a result of accident and incident investigations, audits, inspections, hazard reports and so on and should be SMART actions. SMART stands for

1. Specific.
2. Measurable.
3. Achievable.
4. Relevant.
5. Time-bound.

Corrective Actions can be tracked in a Corrective Actions register or spreadsheet with the following columns as a minimum:

1. Reference (eg Incident Number, Audit Number etc)
2. Action Description
3. Assigned To
4. Due Date

Action management is used to assign and track the actions, and to record closeout evidence. Actions include those arising from incident investigations, improvement actions and actions to closeout hazards.

Significant Incident Learnings

SIGNIFICANT INCIDENT Learnings are designed to communicate learnings from Significant Incidents and Accidents (where the Risk Rating is high) to the workforce to help prevent recurrence. It is critical to communicate these learnings to help prevent rumours spreading and to make people aware of the hazards and dangers, so they can avoid or control them.

Communications to and from the workforce

ENSURING TWO WAY COMMUNICATIONS between the workforce and the leadership team involving matters that may affect their safety. This is done in a variety of ways including Communications screens, noticeboards, Site Safety Meetings, Pre-shift meetings, Site Notices and Safety Alerts.

Lean Tools for Safety

Introduction

ORGANIZATIONS ARE VERY good at capturing safety data into various database systems. What most of them are not so good at is analysing the safety data to help understand safety issues and prevent recurrences of accidents and incidents. This section on Lean Tools for Safety offers some ways in which this gold mine of safety data might be presented and how good use can be made of the information which it contains.

The War Room (Lean Boards)

LEAN ORGANIZATIONS often establish a dedicated room to display Lean Boards. These boards can be paper based or electronic via TV screens. Each board typically contains trends for a particular element of safety or production which needs to be tracked. This room is sometimes called the War Room or Lean Room. Front line managers typically meet at a set time each day to discuss and update each Lean Board with the latest performance figure for each board.

For example, there might be one board showing injuries on a “Safety Man”.

ANOTHER BOARD MIGHT show a Safety Cross of whether an injury has occurred on a calendar day. Typically two colours are used for most lean boards – green for target achieved and red for target not achieved. Examples of typical lean safety boards are:

1. Actuals vs Target number of Field Leaderships (Safe Act Observations).
2. Safety Cross
3. Actuals vs Target number of Hazards Reported.
4. Total Recordable Injury Frequency Rate (TRIFR).

Each board is discussed in turn including reasons why a target was not achieved and improvement actions discussed and assigned.

The Art of Kaizen (PDCA)

KAIZEN IS A JAPANESE word that means continuous improvement, originally taken from the words “Kai” which means continuous and “Zen” which means improvement. For most Japanese people, Kaizen is not just for business or safety improvement, but it is a way of life.

Kaizen was conceived in Japan following World War 2, and is a system that involves every employee and contractor from senior management to the janitor. Everyone in the company is encouraged to come up with small improvement suggestions on a regular basis. This is a continuous process, rather than once a week, month or year. At highly successful Japanese companies such as Toyota, up to 80 suggestions per employee/contractor per year are generated, shared and implemented.

In most cases the ideas generated are not ideas for major changes. Kaizen is based on making small changes on a regular basis - always improving productivity, safety and efficiency, and reducing or eliminating waste.

Suggestions are not limited to a specific area such as production, safety or marketing. Kaizen is based on making changes anywhere that improvements can be made. The Kaizen philosophy is based around “do it better, make it better, and improve it even if it isn’t broken, because if we don't or can’t, we can't compete with those companies that do.” Whereas Western philosophy can be summarized as, “if it’s not broken, don't fix it.” The Kaizen philosophy is that everything, even it isn’t broken, can be improved.

Kaizen is a system of improvement that in Japan includes both home life as well as business and safety improvements. Kaizen even includes social activities. It is a concept that should be applied in every aspect of a person's life – work, health, finances, mental and spiritual.

In business, Kaizen encompasses many of the components of businesses that have been a part of their success. These include Quality circles,

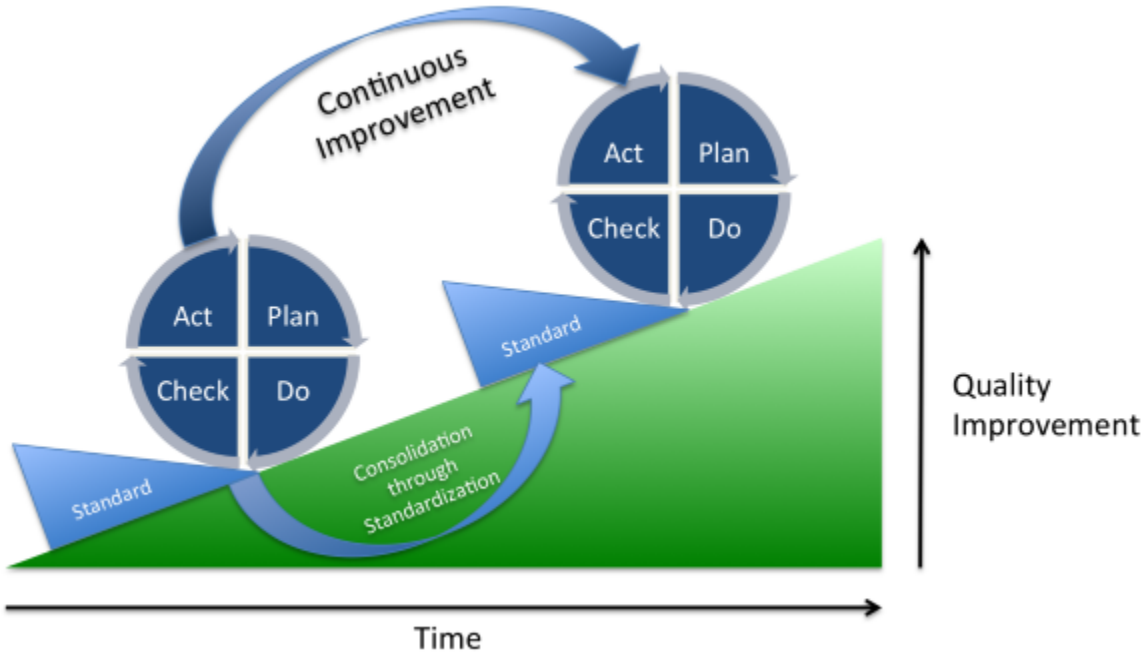
automation, suggestion systems, just-in-time delivery, Kanban and 5S.

Kaizen involves setting standards (called “standard work”) and then continually improving those standards. To support the improved standards, Kaizen also involves providing the training, materials and supervision that is needed for employees and contractor to achieve the higher standards and maintain their ability to meet those standards on an on-going basis.

The Kaizen cycle can be defined as:

Standardize an operation. Measure the standardized operation (measure the cycle time and the amount of in-process inventory). Gauge measurements against requirements. Innovate to meet the requirements and increase productivity. Then standardize the new, improved operation. Then continue with the cycle ad infinitum.

This is also the basis for the PDCA (Plan-Do-Check-Act) cycle introduced by Dr W. Edwards Deming. The concept of Kaizen / PDCA is shown below:



THE FOUR PHASES OF PDCA in the diagram are explained below. The Standard “chocks” show that once an improvement is made, it can become the new standard, as we climb up the Quality improvement “Ramp”.

PLAN

First, establish the objectives and processes necessary to deliver results in accordance with the desired or expected output (the goals or target). By establishing output expectations or deliverables, you are setting the specification for the targeted improvement. When possible it’s best to start on a small scale (eg with a pilot test or trial) to test possible outcomes.

DO

Then implement the plan – in other words execute the process or make the product. Then collect data and information for charting or analysis in the "CHECK" and "ACT" steps that follow.

CHECK

Now study and analyse the actual results (measured and collected in the “DO” phase) and compare against the expected results (the goals or targets from the “PLAN”) to determine any differences. Look for deviations from the plan. Charting and analysing data can make it easier to see trends over several PDCA cycles and to help convert the collected data into meaningful information. Information is what you need for input into the next step which is “ACT”.

ACT

If the CHECK shows that the PLAN that was implemented in DO is an improvement to the prior standard (the baseline), then that becomes the new standard (new baseline) for how the business should ACT going forward (new standards are enACTed). However, if the CHECK shows that the PLAN that was implemented in DO is not an improvement, then the existing standard (old baseline) will remain in place. In either case, if the CHECK showed something different than expected (either better or worse), then there is some more learning to be done... and that will suggest that potential future PDCA cycles should be conducted. Note that descriptions of the PDCA process say that the ACT involves making adjustments or

taking corrective actions... but generally it would be counter to PDCA thinking to propose and decide upon alternative changes without using a proper PLAN phase, or to make them the new standard (baseline) without going through both the DO and CHECK steps.

The Kaizen Blitz

THE KAIZEN BLITZ IS an especially scheduled Kaizen event which is planned to take place over a set period of time (usually a few days), and involves assembling a team of people (process experts, safety people, managers) to focus on a specific process or processes with the intention of improving them. This usually involves observing the actual processes first hand, studying the process and then making suggestions for possible improvements which can then be fed in to a PDCA cycle.

Elimination of Waste (Muda)

WASTE, KNOWN AS “MUDA” in Japanese, is everything that does not add value. Muda is the deadly enemy of value creation. The eight deadly Muda are:

1. Waste of motion (motion or workers and people).

2. Time delays (Cycle Time).

3. Unnecessary transportation and material handling.

4. Producing defects or when incidents/accidents occur.

5. Over processing (unnecessary processing).

6. Over producing (over supply).

7. Storing unnecessary inventory.

8. Missed opportunities.

If you can drive those kinds of waste out of your processes and stay vigilant about it, then you’ve reached the heart of Kaizen.

Here's where the art of standardization becomes your friend. You have to rigorously standardize your processes if you are going to rigorously improve them.

Maintaining your best processes and improving them involves two key activities, what we call the two-cycle wheels. The first cycle is for maintaining your best processes, which are the day-to-day concern of operators and technicians. The other is the improvement the cycles, which is generally the responsibility of the management and engineering staff.

5S

YOU MAY ASK WHAT 5S has to do with Safety, as it is mainly a tool that evolved out of the need to streamline production processes. But it has a lot to do with improving safety as you'll see below. 5S consists of:

Sort. This means to eliminate unneeded items from the workplace that may cause clutter and which can also cause trip hazards. 5S workplaces often have painted walk ways (often green) to mark those areas where it is safe to walk without the likelihood of being struck by a machine or object.

Set in Order. This means to arrange all necessary items so they can be easily selected for use. There should be a place for everything and everything should be in its place. This may involve, for example, ensuring that every tool has a place on the tool board and tools are color coded for easy picking. This also prevents the loss and waste of time and it makes it easy to find and pick up necessary items. A good example of why "Set in Order" is important happened in the air force where a spanner was left in a plane's engine and caused the plane to crash after take-off. If the spanner had been on a 5S tool board, it would have been clear to the supervisor that there was a tool that had not been accounted for. Now it is routine practice to check that all tools are returned to the tool board and accounted for before any plane is allowed to take off.

Shine. This means to clean your workplace completely. You can use cleaning as an inspection tool, for example to discover fluid leaks on machinery and to prevent equipment and machinery from deteriorating.

Standardize. This means to standardize the best practices in the work area into Standard Work procedures or Rules. It also means following and enforcing the procedures or rules.

Sustain. This means to keep everything in working order and to conduct regular workplace audits and inspections to ensure Standard Work procedures are being followed. It also means having the training and discipline in place to do so.

Human Factors (Poka-Yoke)

HUMAN FACTORS REFERS to designing jobs and systems so that if a worker makes an error, it doesn't result in an unwanted event. The spanner example in the section on the "Set in Order" component of 5S is one example. Another example is an Automatic Train Protection (ATP) system fitted to trains to automatically bring a train to a stop should the driver inadvertently begin to exceed the safe breaking distance or the limit of authority.

The 5 Gemba Principles

IN BUSINESS, GEMBA (Genba in Japanese) refers to the place where value is created; in manufacturing, Gemba is the factory floor. It can be any "site" such as a construction site, sales floor or where a service provider interacts directly with a customer.

After an accident, incident or near-miss, the manager's first priority should be to go to Gemba and observe. Gemba is your teacher. When you go to Gemba, what you see is the real data. The report from Gemba you read sitting at your desk is merely secondary information.

There is a golden rule of Gemba management, the 5-Gemba principles, which can be described as follows:

• When a trouble (abnormality) happens, go to Gemba first. This is the first and most important principle. Many managers learn about the problems that happened in Gemba from a report that reaches them several hours, days or even weeks after the event. The best solution is to go to Gemba at once when you hear that a problem has happened.

• Check with Gembutsu (machines, tools, rejects, and customer complaints.) Gembutsu, another Japanese word, means some tangible things on which you can put your hands on. If a machine is down, the machine itself is Gembutsu. If a customer is complaining, the customer is Gembutsu. For instance, if the machine is down, go to Gemba and have a good look at the machine. By looking at the machine, and asking the question "why" several times (the 5 Why's), you can probably find out the reason for the breakdown on the spot.

• Take temporary countermeasures on the spot. For instance, if the machine is down, you have to get it started because the show must go on. Sometimes you kick the machine to get it started. If a customer is angry, you will need to apologize, or even give them some gift to appease them. But these are only temporary measures and do not address the real issue, which leads to the next point.

• Find out the root cause. By repeating the question "why" several times, you can find out the root cause of the problem.

Standardize for prevention of recurrence. Once you identify the root cause, and come up with a countermeasure, you should standardize the countermeasure so that the same problem will not recur.

The 5 Why's Technique

WHEN TRYING TO IDENTIFY the root cause of a problem, incident or issue it is very helpful to ask a series of Why questions. An example:

The vehicle will not start. (the problem)

Why? - The battery is dead. (1st why).

Why? - The alternator is not functioning. (2nd why).

Why? - The alternator belt has broken. (3rd why).

Why? - The alternator belt was beyond its useful service life and not replaced. (4th why)

Why? - The vehicle was not maintained according to the recommended service schedule. (5th why, a root cause).

It is best to let your employees know that you plan to ask a series of Why questions otherwise they may become unsettled with your line of questions. But in any case, it is a very effective technique.

Quality Circles

A QUALITY CIRCLE IS a group of workers who do the same or similar work, who meet regularly to identify, analyze and solve production and/or safety problems. Usually fairly small in size, the group is normally led by a supervisor or manager and presents its solutions to management. Where possible, workers implement the solutions themselves in order to improve the performance of the organization and motivate employees.

Typical topics addressed by Quality Circles are things such as improving Safety, improving Products, and general improvement to the workplace and

manufacturing processes. The term “Quality circle” was first coined by Kaoru Ishikawa, the inventor of Ishikawa diagrams.

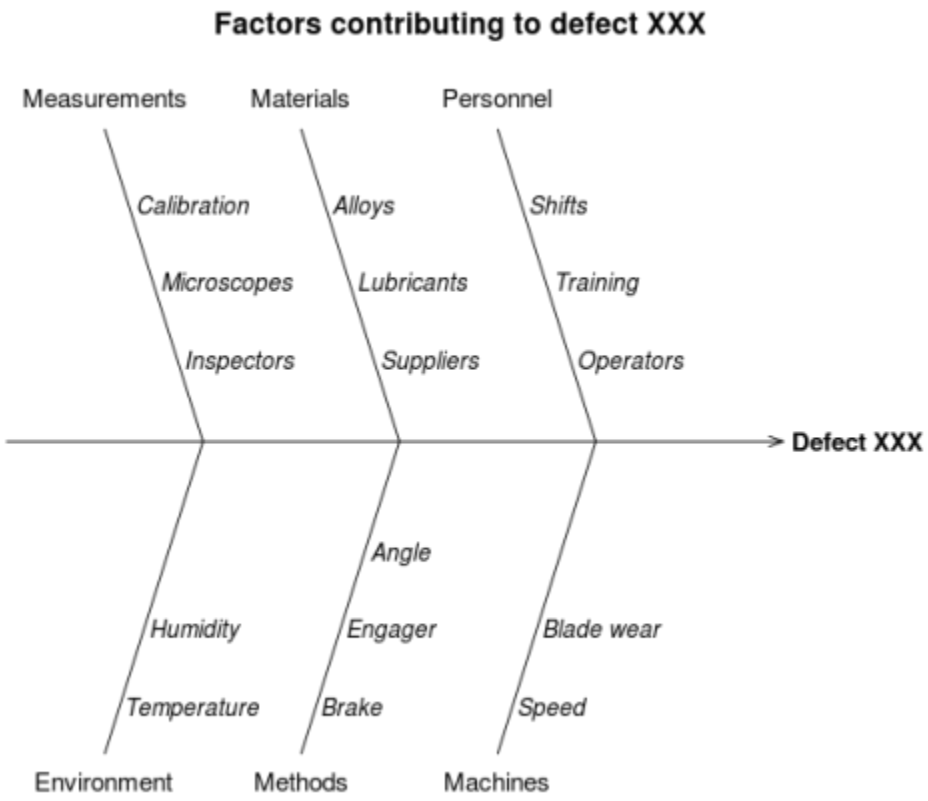
Ishikawa diagrams

ISHIKAWA DIAGRAMS ARE fishbone shaped, showing causal or contributing factors to the incident, accident or issue.

The categories used in the Ishikawa diagram typically include:

1. People: Anyone involved with the process.
2. Methods: How the process is performed and the specific requirements for doing it, such as policies, procedures, rules, regulations and laws.
3. Machines: Any equipment, computers, tools, etc. required to accomplish the job.
4. Materials: Raw materials, parts, pens, paper, etc. used to produce the final product.
5. Measurements: Data generated from the process that are used to evaluate its quality.
6. Environment: The conditions, such as location, time, temperature, and culture in which the process operates.

An example Ishikawa diagram is shown below:



Idea Generation

MANY ORGANISATIONS actively promote employee and contractor engagement in idea generation as a means to come up with ideas to improve safety or production. This can be done in an informal way through setting up a central email account which people can send ideas in to. Or teams of people can be appointed and brought together in groups with the task of solving specific problems. There are many tools and techniques that can help generate ideas. Among them being:

1. Challenge assumptions.
2. Reword the problem.
3. Think laterally or in reverse.
4. Redefine the problem.
5. Brainstorming.

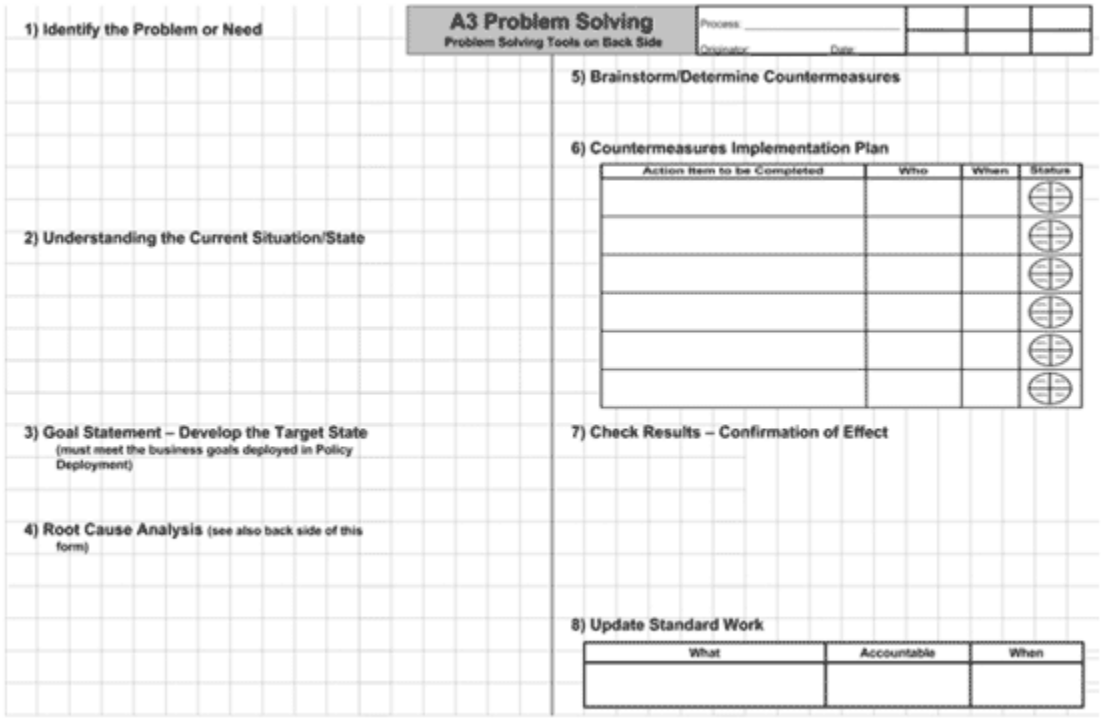
A3 Problem-solving

A3 IS A STRUCTURED problem solving and continuous improvement tool based on a single sheet of A3 paper which is where it got its name. An example of the steps to follow are listed below:

1. Identify the problem or need.
2. Understand the current situation and state.
3. Develop the goal statement (the target state).
4. Perform the root cause analysis.
5. Brainstorm/determine the countermeasures.
6. Create the countermeasures implementation plan.
7. Check the results – confirm the results.
8. Update the Standard Work procedures.

These steps follow the Plan-Do-Check-Act (PDCA) cycle, with steps 1 through 5 being the "Plan", Step 6 being the "Do", Step 7 being the "Check" and Step 8 being the "Act".

The steps are typically laid out like this on the A3 template:



Metrics

THEY SAY YOU CAN'T manage what you don't measure. This is true both for production and safety. Data from incidents can be collated, sorted and presented in a number of ways which allow management and workers to identify areas for safety improvement. Presentation formats include:

Lean Boards

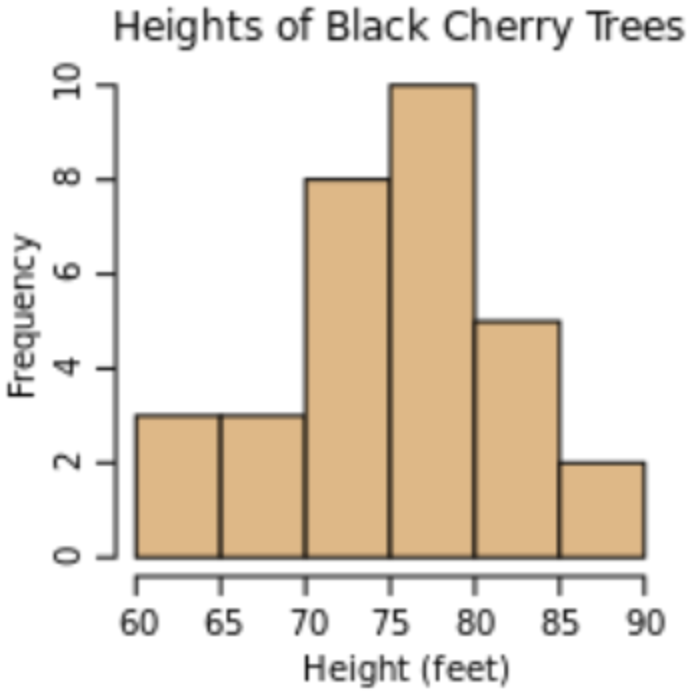
We have touched on Lean Boards in the section on the War Room. The boards are used to focus on measuring planned vs target (or actual) performance both for production and safety Indicators including Key Performance Indicators. Typically a green color is used to indicate a target has been met and red is used to indicate a target as not been met.

Pareto Charts

Pareto charts are a form of grouped vertical bar chart, sorted by the highest bar (on the left) to the lowest bars (on the right). The bars are usually shown as a percentage but can also have absolute numbers shown on another vertical axis. Pareto charts allow you to quickly see which statistics account for most of the safety incidents or production delays. The Pareto chart got its name from the 80-20 (introduced by Vilfredo Pareto in 1896) rule which states that 80% of your delays or incidents are typically caused by 20% of the types of delay or incident.

Histograms

Histograms are a type of bar chart that groups results into bars. For example, the number of injuries per department may be graphed as a vertical bar chart, with one bar per department. In this case the grouping is by department. A sample histogram is shown below:



Taxonomies

A TAXONOMY IS A FORM of analysis of safety data whereby the data is grouped by a category or class. For example a taxonomy of injuries would count the number of injuries by body location. So it may count the number of hand injuries, the number of foot injuries and so on. Taxonomies are an excellent tool for focusing on problem areas and highlighting which areas need attention or improvement plans. For example if hand injuries and neck injuries are the top two types of injuries then effort should be focused on determining the root causes and possible mitigations to reverse the trend.

Benchmarking

BENCHMARKING CAN BE a formal or informal method of comparing the safety (and/or production) processes, systems and performance of one company or department with another. Internal benchmarking is often effective when we have similar departments or areas so we can compare

apples with apples. Benchmarking enables the cross-transfer or cross-fertilization of ideas or ways of doing things better, thus resulting in a win-win benefit for both parties. One problem with external benchmarking is that there can be too many other variables that get in the way of comparing apples with apples.

Robotics – the future

ROBOTICS AND AUTOMATION, including autonomous vehicles will become more prevalent in the industry especially as major advances in technology occur as we march towards the 2020's and 2030's. This does not mean that people will be out of work. People will always been needed to use their brains to help improve safety and production processes. An excellent Youtube video which highlights the use of robotics in the future is called "Humans need not apply" and is available at this URL:

https://www.youtube.com/watch?v=7Pq-S557XQU

Conclusion

I HOPE THIS BOOK HAS been useful in helping you to establish or improve your safety management system, and most importantly to keep people safe from harm or injury and ensure they go home to their loved ones at the end of each shift.

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BOOKS 2 READ

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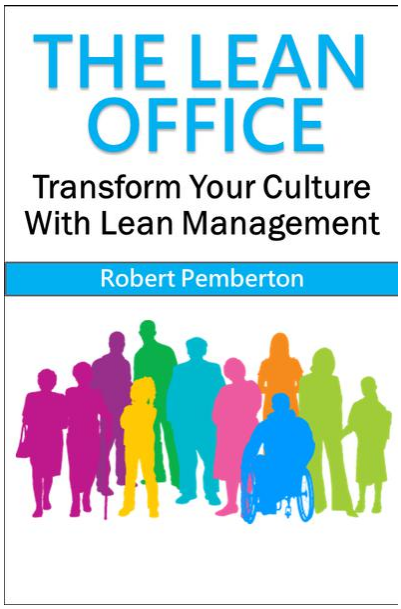
Did you love *Lean Safety: Transforming Your Safety Culture With Lean Safety Management*? Then you should read *The Lean Office: Transform Your Culture With Lean Management* by Robert Pemberton!



The Lean Office

This book will enable you to transform your culture and enhance your bottom line by implementing Lean Management concepts. It's applicable to all types of offices, large and small. From Fortune 500 companies, thru to Government agencies and to small businesses, by implementing the key principles described in this book, you will improve your triple bottom line of lowering costs, improved production and improved safety.What is Lean?

A lean culture empowers your employees, removes unnecessary waste, and focuses on the customer. Lean is a way of delivering what your customer needs or wants at the lowest cost and in a timely and efficient manner. Lean is not something that sits apart on a shelf, away from your other business processes and is only used when needed. In contrast, it is your organizations "way of life". It should be embedded across all of your processes. It's a way of looking at your business processes through an "improvement lens" and eliminating waste to ensure the customer is getting the most value. This ensures the customer gets what they ask for, when they

need it, at the lowest cost. Lean is focused on delivering customer expectations.Lean can be applied to virtually every known process whether it be manufacturing, safety, health care or even personal development and personal relationships.

Contents:

The Lean Office.What is Lean?.Why Lean?.Customers.Value.Eliminating Waste.The Lean Office.Implementing Lean through Values.The War Room (Lean Boards and Lean Meetings).The Art of Kaizen (PDCA).The Kaizen Blitz.Elimination of Waste (Muda).Lean Checklists.5S.Human Factors (Poka-Yoke).The 5 Gemba Principles.The 5 Why's Technique.Quality Circles (Action Meetings).Ishikawa diagrams.Idea Generation.A3 Problem-solving.Lean Boards.Pareto Charts.Histograms.Benchmarking.

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About the Author

Robert Pemberton is passionate about writing books, articles and publications for people who need to find quick, easy and affordable expert advice and solutions to their problems. In an easy to read format with real life examples, Robert guides the reader step by step through simple and practical solutions.