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Safety Mangement in Oil & Gas Industry - The How's and the Why's

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Abstract

Operation management in complex process plants such as major hazard facilities are regularly called upon to make decisions that balance the production and safety requirements of their organization. The process-based rules commonly used in manufacturing and process industries are permit to work systems, risk assessment and job safety analysis.

Job Hazard Analysis or Risk Assessment is a safety management tool in which the risks or hazards of a specific job in the workplace are identified, and then measures to eliminate or control on those hazards are determined and implemented. More specifically, a job safety analysis is a process of systematically evaluating certain jobs, tasks, processes or procedures and eliminating or reducing the risks or hazards to as low as reasonably practical (ALARP) in order to protect workers from injury or illness. It focuses on the relationship between the worker, the task, the tools, and the work environment. As the term 'job safety analysis' is not restricted to only identification of hazards, but the implementation of controls (Mitigation plans) and verification of the effectiveness of those controls, the term 'safety' will have a more appropriate meaning in the context of assessment of risk in a job. A JSA is a task oriented risk assessment which can be applied by a work team prior to undertaking a potentially hazardous activity. Risk Assessment is a planned procedure in which all hazards in the workplace are identified and their Risk Potential evaluated. The Risk Potential is a combination of the likelihood with the severity if an accident did happen. The first step in any risk assessment is to conduct a hazard analysis.

A Permit to Work System is an important part of an Oil and Gas company's Safety Management System and a key component of a Safe System of Work. A PTW System helps to ensure that all work is planned, communicated, controlled and carried out in a safe manner. Permit-To-Work is a proven best-practice method to ensure safety on dangerous hazardous worksites. A permit is a written, signed legal document and is a means of communication between site management, plant supervisors, operators and those who carry out the work. The most appropriate type of permit is determined and used according to the nature of the work to be performed and the hazards to be eliminated or controlled.

Therefore, it should be emphasized, however, that a 'permit to work' is not a replacement for robust risk assessment & hazard analysis, but can help bring the risk assessment 'to life', at the sharp end, where it matters.

INTRODUCTION

JOB HAZARD ANALYSIS (JHA)

The job hazard analysis process is the heart of a proactive occupational safety and health program. Properly applied, this process ensures that safety and health of employees is fully considered during the planning stages of a project of activity. Each potential hazard is considered; and procedures that will insure that employees are not exposed to that hazard in a way that could cause harm are established and implemented prior to beginning work on the project.

To be properly understood and implemented, the job hazard analysis should be viewed as a problem-solving

process. The problem is defined in terms of hazards, which may be encountered by employees when they perform tasks involved in the project under consideration. The solution is a set of actions which creates a safe work environment and establishes safe work procedures, and which is feasible and implemental given the constraints and opportunities associated with that project.

A safe work environment and safe work procedures are essential outputs and integral to any project or activity. They are as important as more commonly recognized outputs, such as contracts administered, habitat enhanced, and plans produced, etc. Providing for a safe work environment and safe work procedures requires similar planning activities as those, which ensure the other project outputs, are accomplished and standards are met. Such activities include reconnaissance, obtaining input from specialists and customers, cost projections, consideration of alternatives, and all the other problem-solving procedures that are central to our resource management decision-making process.

This process provides the format for building safety into every project. Conducting and documenting a job hazard analysis before beginning work on a project or research study has been a Forest Service requirement for over 20 years. Properly understood and implemented, a job hazard analysis is a powerful tool to insure that work is conducted safely. However, when it is not understood or properly implemented, it is often treated as a meaningless bureaucratic requirement. In fact, many employees do not even view a job hazard analysis as a process, but think of it as a form that has to be filled out!

The best job hazard analyses are those that are focused, complete, clearly documented, communicated to employees, and implemented. The purpose of these guidelines is to help make that happen.

Job Hazard Analysis (JHA) is the process of taking a close, critical look at each step of a process or operation with an eye toward identifying and correcting the hazards or potential accidents in each step.

It's a simple technique which creates a "buy-in" on the part of people doing the job and ensures that they will do the job the same way....and safely....each time.

A JHA can also be conducted as part of the planning for a new job or process. Prospective operators can sit in a planning session with engineers, designer, technical staff (e.g., safety, environmental, Occupational health), and supervisors to talk through how a new operation should work. This can eliminate the hazards before the cost of development makes it much more expensive and it gives clear work steps for use in debugging and training.

The benefits of a JHA of existing jobs are many:

- Many accident-causing hazards are eliminated.
- It provides a standard, written, carefully considered safe directions for how to do the job for use in job orientation/training.
- It allows for refresher instructions on infrequent/periodic jobs.
Workers, teams, and supervisors know better how the *total* job is done.
- Job methods improve, efficiency increases, quality is enhanced and costs drop.
- The operator is kept closely involved in safety.

Before the JHA is started, decide who's going to be involved. Ideally, all those involved with the job should work together on the project so that there is comprehensive input and complete buy-in. If that is not possible then be sure that those doing the job at least have the opportunity to provide input and review.

STEP ONE: Select the job. Don't make it too broad (e.g., make a desk) nor too narrow (e.g., pushing a button). Those suitable would be those a line supervisor would normally assign. Priority should be given to those with the worst accident record, those which tend to produce disabling injuries, ones with a high severity potential, and new jobs.

STEP TWO: Break the job into successive steps. Describe concisely what is being done. Pick an operator who is experienced and cooperative to help and tell him/her that the objective is to study the job, not the individual, to make it safer for them. Work through the process, asking the operator what he/she does next and why. Record the observation in the left-hand column of the attached form using action words (lift, pull, close) and tell what object is receiving the action (lever, cover, arm). Finally, check with the operator to be sure that the steps are correct and in the right order.

STEP THREE: Identify the hazards in each step of the process. Can anyone be caught in, on, or by the objects? Can they slip or trip? Is straining possible? Are there environmental hazards? Is layout or Placement is a problem? Are tools and equipment adequate and in good repair? Will a change in one step create a hazard in another? Once the hazards are identified, check again with the operator and anyone else familiar with the job.

STEP FOUR: Eliminate the hazards. Find creative and effective ways to eliminate the hazards and prevent the potential accidents. Find a better way to do the job. Start with the goal of the job and work along several routes to the goal finding the one which is not only the safest, but the most economical and practical. Change the physical conditions which create the problem....move something...change a work height replace a guard. Change the job procedure. Have the job done less frequently if exposure is a problem (especially in maintenance operations). As with the previous steps, check solutions with the operator. Watch him/her in operation and carefully evaluate whether the steps and actions match the completed JHA. At this stage, it might also be helpful to record the steps on video for use in future training.

Once the JHA is complete, use it, and don't just file it away. If possible, post it on the job, such as near the operator controls. Make it an integral part of the job write-up. Review and update it periodically, perhaps each year. Consult with others whenever an accident occurs on a JSA-covered job and either revise it or insure that the correct procedure is being followed.

Use of Analysis Methods Analysis Method	When to use	Intent
Hazard Analysis (e.g. Risk Assessment, Job Hazard Analysis, Job Safety Analysis, Safety Plan)	During the planning phase of work: pre-work	To identify anticipated hazards and plan mitigations To ensure that the right number of people, skill sets, equipment and PPE are included in the plan To identify the types of certificates required to do the work To identify the SWP standards and SOPs applicable to the work For use as starting point for onsite JHA
Job Safety Analysis (JHA)	During the permitting phase of work: prior to start of work	To involve the work team to make sure that the people doing the work understand the tasks, hazards and mitigations To address onsite conditions on the day of the work To insure that mitigation measures are in place To verify that work team has proper skill level and tools
Think about hazards	Anytime	To prompt workers to think before they act To ensure that the worker is looking for hazards while they are doing work To support Stop Work Authority and the Tenets of Operation

The Job Hazard Analysis Process represents only one aspect in establishing a safe environment. Developing procedures to identify and define the loss potential in a facility or operation is a combination of risk and hazard analysis, behavior consequence analysis, and organizational design review. Understanding these elements is essential in the improvement of a safety management system.

Risk and Hazard

To be effective, it is essential that management assess the operation and develop an in-depth appreciation of the nature and scope of any risk associated with the operation. This assessment will help to identify hazards related to activities that are inherently unsafe. If used routinely, an effective Job hazard Analysis will enhance the effectiveness of any safety process, no matter the type of organization.

Human Behavior

The next element in developing a risk assessment process is to review human behaviors that results in the completion of assigned tasks and the underlining culture of the organization. "Consequences analysis" or "gap analysis" are great tools that can be used to determine if the facility has unconsciously designed specific procedures and/or guidelines that potentially drive the wrong behaviors. The ideal safe behavior is driven by the reinforcement and understanding of what happens after specific at-risk behaviors. The consequences assessment will help managers better determine the type of feedback that employees should receive when they perform a task.

The consequences of working safe and following safety rules may be found to be outweighed by the consequences in place for getting the job completed. Employees may take reducing the risk of a supervisor's criticism about productivity (high probability) over the risk of injury as the possibility that something injuries will happen is usually a low probability for most tasks. We, as a society, appear to have a built in bias towards "if there is no immediate loss, there is no immediate risk." "I have done this for thirty years this way and have never been hurt."

However, there is a rule of thumb that most safety professionals use. If you have adequate, well written safety rules and guidelines in place and are still finding that those rules are not being followed, then there are hidden consequences driving this unsafe behavior and you must uncover what is driving that behavior. Even the best Job Hazard Analysis cannot overcome strong consequences that drive the wrong behavior.

The Management Process

This element of any successful Job Hazard Analysis Process is to ensure that the facility has an effective administrative structure that brings individuals with the correct physical abilities, skills and knowledge into the organization. This structure is coupled with proper training and orientation that communicate what the employee must do to safely perform their duties.

Employees must meet the needs of the operation and be able to complete the tasks and use the technology in order to reach the desired job goals. The structure of management and supervision must be designed to assure mentoring and coaching skills effectively manage the process, provide adequate resources and communicate what is expected of all employees. The work environment hazards and risk must be understood and these elements must be in alignment. Friction between these elements, i.e. tasks not designed for the technology, employees not understanding the technology, improper supervision, too many work rules, or any other types of gaps in these interrelationships will, at some point in time, result in a loss. The scope or severity of that loss will be dependent on the nature of the hazards in the work environment.

Once all of the elements have been communicated and there is a demonstrated understanding of all three phases, developing the Job Hazard Analysis Process will have a greater chance of being successful.

The Job Hazard Analysis can be used as the foundation of your safety process, and will help to provide structure, for safety training, safety compliance, hazard and risk controls, inspections/audits, coaching/observations and other safety activities. If a core standard, such as ANSI AIHA Z10 2005 or OHSAS 18001 is being used, the Job Hazard Analysis process can be tapped by many of their elements.

As OSHA moves towards an Injury and Illness Prevention Program (I2P2) standard, safety managers may be required to better assess and complete a thorough review of the workplace. Implementing an effective I2P2 can be enhanced by the establishing of a solid Job Hazard Analysis process. A comprehensive hazard and risk assessment based on Job Hazard Analyses can aid in setting priorities and the rank ordering of jobs, steps, and tasks by potential severity and loss frequency. As more details and insights on where hazards and risk exist, the I2P2, ANSI Z10 process can be adjusted and customized to the site-specific needs and not just be a generic approach to safety

The approach to establishing an effective Job Hazard Analysis should include:

- 1. Employees should be brought into the hazard identification and hazard analysis. Further, management and administrative involvement will be necessary assure communication of the safety process and why Job Hazard Analysis is important.
- 2. One obstacle that could prevent employees from participating is the misperception that Job hazard Analysis is a form of time and motion study. While it may help with improving the job, these are not purely efficiency studies directed at employee effectiveness. Training may be needed on the basics of hazard identification and the logistics for setting up the process will need to be reviewed.
- 3. Candid and open communications are essential. Employees must be free to report problems or perceived issues without fear of reprisal. The workplace climate must be open and trusting for issues and problems to be discussed. If not, deeper problems with the relationship between safety and operational issues must be addressed.
- 4. The methods to communicate issues and activities within the organization must be determined. The quality and depth of communications determines what messages and knowledge get through to all levels of the organization. An analysis may show where communications are slowing or stopped, limiting full knowledge of known risk or uncontrolled hazards.
- 5. The methods and tools used to identify hazards and qualify risks should be reviewed. Inspections, accident investigations, maintenance records, as well as rules, policies, procedures, etc., should be comprehensive, effective and upgraded and revised as warranted. Report tracking of recommendations, controls and issues is essential to assuring effective implementation of controls.
- 6. Timely feedback or responses to employees about findings and concerns must be planned in advance. As Job Hazard Analyses, hazards and risk related questions develop, a combination of meetings, interviews, and written communications must be rapidly sent to the level of authority that can address the potential severity. As high severity issues are identified, senior decision makers must be made aware with immediate controls or even "cease activity" decisions taken until controls can be devised.
- 7. Formal plans for corrective actions or job modifications must be in place as risks or hazards are identified. Procedures designed to get the immediate short term controls in place while the long term fix is being developed should follow an organizational "project management" model.
- 8. It is essential to track and follow-up on new procedures, protocols, job, steps, and task changes. You must be assured that corrective actions are tracked and that administrative controls and communications effectively assure that they are working.




The Job Hazard Analysis can clarify and reduce underlying confusion or conflicts regards the steps needed for a better workplace. As most employers and employees want to do the right thing and take pride in their work and safety record you should consider the following statement" "Job Hazard Analysis - Improving Safety One Job, One Step, One Task at a Time"

Risk assessment

A risk assessment is simply a careful examination of what, in your work, could cause harm to people, so that you can weigh up whether you have taken enough precautions or should do more to prevent harm. Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures. Accidents and ill health can ruin lives and affect your business too if output is lost, machinery is damaged, insurance costs increase or you have to go to court. You are legally required to assess the risks in your workplace so that you put in place a plan to control the risks.

How to assess the risks in your workplace

Follow the five steps in this leaflet:

- | | | |
|---|--|--------|
|  | Identify the hazards | Step 1 |
|  | Decide who might be harmed and how | Step 2 |
|  | Evaluate the risks and decide on precautions | Step 3 |



Step 4

Record your findings and implement them



Step 5

Review your assessment and update if necessary.

Don't overcomplicate the process. In many organizations, the risks are well known and the necessary control measures are easy to apply. You probably already know whether, for example, you have employees who move heavy loads and so could harm their backs, or where people are most likely to slip or trip. If so, check that you have taken reasonable precautions to avoid injury.

If you run a small organization and you are confident you understand what's involved, you can do the assessment yourself. You don't have to be a health and safety expert.

If you work in a larger organization, you could ask a health and safety advisor to help you. If you are not confident, get help from someone who is competent. In all cases, you should make sure that you involve your staff or their representatives in the process. They will have useful information about how the work is done that will make your assessment of the risk more thorough and effective. But remember, you are responsible for seeing that the assessment is carried out properly.

When thinking about your risk assessment, remember:

- Hazard is anything that may cause harm, such as chemicals, electricity, working from ladders, an open drawer etc.
- Risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Some frequently asked questions

What if the work I do tends to vary a lot, or I (or my employees) move from one site to another?

Identify the hazards you can reasonably expect and assess the risks from them. This general assessment should stand you in good stead for the majority of your work. Where you do take on work or a new site that is different, cover any new or different hazards with a specific assessment. You do not have to start from scratch each time.

What if I share a workplace?

Tell the other employers and self-employed people there about any risks your work could cause them, and what precautions you are taking. Also, think about the risks to your own workforce from those who share your workplace.

Do my employees have responsibilities?

Yes. Employees have legal responsibilities to co-operate with their employer's efforts to improve health and safety (eg they must wear protective equipment when it is provided), and to look out for each other.

What if one of my employee's circumstances change?

You'll need to look again at the risk assessment. You are required to carry out a specific risk assessment for new or expectant mothers, as some tasks (heavy lifting or work with chemicals for example) may not be appropriate. If an employee develops a disability then you are required to make reasonable adjustments. People returning to work following major surgery may also have particular requirements. If you put your mind to it, you can almost always find a way forward that works for you and your employees.

What if I have already assessed some of the risks?

If, for example, you use hazardous chemicals and you have already assessed the risks to health and the

precautions you need to take under the Control of Substances Hazardous to Health Regulations (COSHH), you can consider them 'checked' and move on.

No matter the industry or size of a business, accidents happen. Risk assessments help prevent injuries and illnesses in a business to help keep you, your employees and the public safe. While it can be time consuming to perform risk assessments and implement changes, the consequences of not doing so may raise your insurance rates, result in worker compensation claims and reduce productivity.

Evaluating the Workplace

- When you evaluate the actual workplace, take into consideration its size and location. Compare these physical attributes to the type of work performed, as well as the nature and degree of inherent dangers. If your business is located near a body of water that floods often, for example, you may find that relocating to an area of the city that is at a higher elevation can help solve issues regarding business continuity. Another example of evaluating the workplace can include examining the machinery you use, the safety precautions employed to reduce risks while using machinery and the ongoing effort to make the workplace safer. When examining machinery, it is important to remember to assess the security of the computer networks and IT structures.

Employee Participation

- Risk assessment for a workplace does not have to be the sole responsibility of one individual. By enabling employees to understand that they have the right to work in a safe environment, they also have the responsibility to practice safety techniques. In addition to appointing a safety committee, encourage an open dialogue between staff and supervisors regarding safe practices. Bear in mind that some workers, like expectant mothers or disabled workers, may have safety needs that differ from those of other workers, so it is beneficial to seek additional points of view when conducting an assessment

Qualitative Techniques for Risk Assessment

Every company, investment and project has risk. Qualitative risk assessment does not seek hard, financial numbers for calculating the prospective value of assets, projected losses or the cost of working on a specific project. Qualitative assessment is used to determine relative values, risks and strategies for current and future projects.

Procedure

- Prior to the analysis, questionnaires or workshops can be set up to gather data from stakeholders. These questionnaires will determine the assets and strategies the company already has that can be used for the project. Asset values and potential threats are evaluated and estimated. Risks are identified, and probabilities are assigned to each risk, providing a hierarchy. The consequences of each risk are assessed. Controls or strategies are put in place to avoid corporate weaknesses and threats. These strategies are discussed and then implemented.

Methodologies

- Preliminary risk analysis identifies what hazards may lead to an accident, so prevention measures can be identified and implemented. Fault tree analysis finds the origins of a problem by tracing it back to its root. Event tree analysis identifies possible outcomes of specific decisions or occurrences. Cause-consequence analysis blends both fault-tree and event-tree analysis by identifying the source of an event and determining all possible outcomes from that event. These methodologies are used to identify hazards and determine the risk probability of specific events.

Benefits

- Qualitative risk assessment does not require the calculation of accurate sales and costs, so it is easier to conduct. The values and costs are estimated. This type of research allows projects to show immediate results that can be qualified by managers. Each event is assigned a probability of occurring based on reliable data. Analysis will also identify if a project will be on time, on budget and within its parameters. Risk analysis can be updated with real-time, actual data from the project as it is implemented.

Disadvantages

- The risk values from qualitative research are vague. Managers are required to make decisions based on vague financial data, and this can cause problems with accounting and finance managers because it may

not fully assess the risk of a project. Heuristics, discovery or problem-solving techniques that use trial-and-error methods, are used to identify possible risks, but these may lead to bias and faulty judgments. Every situation requires unique criteria and separate calculations. The qualitative process seeks to identify every risk that could possibly come against a project or company, but it is difficult to predict every risk or challenge that will occur on a specific project. The data must be based on historical, reliable information or the statistics are worthless for predicting risk.

Risk Assessment Tools for the Workplace

For an employer, it is crucial to manage risk in the workplace to ensure the safety of employees, inventory and facilities. By identifying and making a plan to manage the risks and hazards in your workplace, you can reduce chances of injury. A variety of risk assessment tools, such as forms and maps, are useful to help spot, analyze and report potential issues.

Assessment Form

- One of the easiest ways to assess risk in your workplace is to use an assessment form that you have designed to suit your industry and operations. First, list the risks and hazards that exist around your workplace; include standard hazards, such as spills or loose cords, and risks that are more specific to your type of business, such as machines with unexpected moving parts. Then, list the people or groups of people who will be at risk from each of your identified hazards. In a third section of the form, list the controls that are in place to handle each hazard and make a note if additional security is needed.

Risk Map

- Risk mapping is a way to map out the danger spots, risks and hazards in your facility. Start with a blank floor plan of your building that shows all of the architectural features; if you operate a shop floor or an area with complex machinery, get a second map that shows the layout of the production line in more detail. On your maps, note places that present risks from chemicals, slips, electricity, equipment or industry-specific operations. With the visual representation of risk, you will be able to identify areas that are particularly dangerous

Staff Interviews

- Because your employees often have the most direct exposure to risks in your workplace, they can be a valuable source of information during the risk assessment process. Hold staff interviews with those in different departments to get insider knowledge of the dangers and hazards they face that you might not be aware of. Hold individual interviews and group meetings to get a sense of the group's level of concern around each hazard.

Regular Review

- Regular review of hazards is a crucial part of keeping your risk assessment program current. Create a set of review forms that are designed to show the progress between reviews. In the first section, include your findings from the initial risk assessment; in subsequent sections, leave room to add or remove hazards, make notes about changes to each hazard, or mention controls that have been implemented to reduce risk.

Permit to Work

The Permit-to-Work procedure provides a formal control system aimed at the prevention of accidents and damage to property where foreseeable hazardous work is carried out.

The Permit-to-Work consists of documents which:

- ✓ Details the work to be done.
- ✓ Details the precautions to take.
- ✓ Identifies all the foreseeable hazards.
- ✓ States the control measures to be implemented.
- ✓ Cancellation.
- ✓ List other permits in operation.

Permits themselves do not make a job free from risks, they rely upon effective control and co-ordination in order that hazards are identified and risks are suitably assessed.

A work permit system consists primarily of a standard procedure designed to ensure that ALL potentially hazardous routine and non-routine work should be assessed re: a hazard checklist and then decide if a permit is required, this is to ensure works can be carried out safely.

The procedure should define the need for the following essential steps:

- Details of the necessary preparatory work including assessment of hazards, precautions necessary to make equipment safe and preparation of a work procedure which clearly defines the scope of the work and describes in logical sequence the manner in which the job will be carried out;
- A clear definition of responsibilities;
- Appropriate training of the workforce and provision of adequate information relating to potential hazards,
- Provision of adequate safety equipment,
- A formal work permit, with or without attached specific checklists, to be signed by a responsible individual and the person carrying out the work.

Guidelines for using the “work permit”

- The information given in the permit and its attachments must be specific, detailed and accurate. It must be stated which equipment or plant has been made safe, the exact nature of the work to be carried out and the safety precautions required.
- The permit must specify the date and the period of time for which it is effective. This period should be short, preferable 8 hours, or one shift, but normally not more than 24 hours. When the permit has expired, proper arrangements should be made for either reissuing the existing permit or issuing a new one. Where a permit is valid for a period longer than one shift, there must be a procedure to communicate instructions from one shift to another.
- It must be made clear that no work will be carried out other than that specified in the permit. If it is found that the programme of work must be changed then the existing permit shall be cancelled and a new one issued.
- It must be made clear that no work will be carried out at a place other than that specified in the permit and that no change is allowed. This prohibition must apply to all personnel including senior staff. As stated above, a change of scope shall result in the cancellation of the existing permit and the issue of a new one.
- The permit must be approved/signed by an authorized person, this person should normally be a supervisor or a manager.

Such a person must:

- Be directly accountable for the plant or equipment on which work is to be carried out,
 - Fully understand the work programme and how it is to be performed,
 - Have full knowledge of the plant and the potential hazards associated with the process and equipment,
 - Be competent to ensure that all safety precautions have been properly implemented before signing and issuing the permit,
 - Ensure that direct and unbroken communication links are established with the person (s) carrying out the work both prior to and during the work activity to prevent the occurrence of misunderstandings.
- The permit shall be accepted and signed by the person who is in immediate charge of the work and who, from that moment, becomes responsible for ensuring that all specified safety precautions are observed, that only authorized work is carried out and that the work is confined to the area defined in the permit. Other personnel involved may also be required to sign the permit as appropriate.
 - It is good practice that a copy of the permit is given to the person responsible for carrying out the work and that a second copy is retained centrally by the production staff and/or plant manager for reference. Both copies should be posted and visible both where the job takes place and in another place so that in case of an emergency, persons involved may get a quick overview of the ongoing work and of the related hazards.

A Permit to Work is a procedure, with a written permit form, which is used to authorize and control work activities with high risk hazards. The Permit to Work procedure:

- identifies the work that is to be completed
- ensures that all potentially hazardous work is controlled and properly authorised;
- ensures that all hazards associated with the work have been identified;
- ensures that all necessary safety procedures for controlling the risks are properly implemented while the work is being completed; and,
- ensures that the worksite is left in a safe condition when the work is completed or suspended.

A Permit to Work, when effectively developed and implemented, serves as a checklist to ensure that all hazards, control measures, work procedures and general safe work requirements are identified, documented, reviewed with and understood by the personnel who will be involved with the work activities. A Permit to Work provides a record of the authorization and completion of the hazardous work activities, the controls and the authorization for the work.

Permit to Work Applications

A Permit to Work should be used for all high risk work activities where existing controls have not reduced the risks to acceptable levels. Additional risk controls will be developed and implemented through the Permit to Work process (procedure) to ensure that the risks are reduced to acceptable levels. Often, a Permit to Work is used for non-routine work. A “non-routine” task is any task that is not described in established procedures and which involves hazardous work that must be controlled to reduce the risks to acceptable levels.

A Permit to Work should be used to:

- Describe the work to be completed;
- Identify the hazards associated with the work;
- Specify the necessary safety precautions (risk control measures) that must be implemented to manage the risk;
- Provide appropriate authorisation and responsibilities for proceeding with the work within a specified time and within specified limitations;
- Inform all affected personnel that the work is being done;
- Ensure that the plant and equipment are returned to a safe condition when the work has been completed or suspended.

Safety Management System

System safety is the application of engineering and management principles, criteria, and techniques to achieve an acceptable level of safety throughout all phases of a system. Achieving this definition of system safety is the primary objective of SMS.

A well-structured SMS provides a systematic, explicit, and comprehensive process for managing risks. This process includes goal setting, planning, documentation, and regular evaluation of performance to ensure that goals are being met.

SMS includes several key system safety principles as shown below:

Management commitment to safety - Because the attitudes and actions of management can significantly influence the entire staff, it is therefore critical that these leaders commit to the success of an SMS implementation.

Proactive identification of hazards - Early identification and reporting of hazards can save a significant amount of time and resources down the road.

Actions taken to manage risks - A system must be in place to determine logical approaches to counteract known risks to safe operation.

Evaluation of safety actions - An ongoing evaluation of the impacts of risk management actions is necessary to determine if further remedial activities are required.

Objectives of a Safety Management System

Safety management is an important part of a business. Companies will set up a list of standards and goals for employees to follow during normal operations to prevent accidents and destructive behavior. Some industries are regulated by government agencies because of the dangerous nature of the work conducted by companies. These agencies will also issue seals of approval for companies with strong safety management systems, creating goodwill for the company.

Safety Management System

- Companies usually provide all departments and employees with a manual of guidelines for achieving safety management goals. This manual, known as the Safety Management System (SMS), provides a broad overview of the company's safety policies, pertinent government regulations, and systems that ensure proper safety management. The objectives of the SMS will be routinely reviewed by management and employees to ensure that everyone understands the reasons for the SMS.

Internal Safety Goals

- An important part of the SMS is instructing employees on the standards that help prevent workplace injuries. These standards are usually specific to the company's industry, since some industries are riskier than others. Rules are laid out for necessary safety equipment, how it is used and where it is located in the department. Workers should be encouraged to discuss the SMS with management and provide ideas for improvement on employee safety.

External Safety Goals

- Companies may also have goals for safety management with individuals outside of their employees. Retail, airline, food and construction industries are examples of industries that have safety goals for non-employees because their business operations occur around the public marketplace. Standards are used to create safe environments for consumers because accidents involving outside individuals can create major publicity issues for the company. Additionally, lengthy legal issues may arise if the company is negligent in protecting consumers.

Emergency Preparedness

- Emergency preparedness plans are a special part of the company SMS. Companies must prepare their employees for any situation that can occur during normal business operations, including natural disasters, robbery, threats or medical situations. Policies for these events should be detailed and posted for employees to follow in case an emergency happens on company property. Planning for these situations can be difficult, but is necessary to prevent minor accidents from becoming major incidences.

Benefits of a Safety Management System

If you implement a safety management system, your workplace will have fewer accidents and healthier employees. By taking a systematic approach to safety, you will lower your risk level and insurance costs, and you'll be compliant with regulatory standards.

Reduced Costs

- Putting a safety management system into place saves money. Reducing liability and risk in the workplace lowers insurance claims and premiums. The system ensures regulatory compliance, so fines and other costs associated with noncompliance are reduced or eliminated.

Reduced Risks

- A safer workplace is a result of identifying current and potential hazards, and eliminating or reducing the risk to an acceptable level.

Competitive Advantage

- Demonstrating your commitment to the health and safety of your employees enhances your corporate image to customers. It increases stakeholder confidence by providing assurance that legal compliance is effectively managed.

Improved Operational Efficiency

- Managing your workplace safety reduces accidents and downtime. The system provides employee involvement and training, motivating them to safely and efficiently perform their jobs.

Safety management is the process of creating safety guidelines for your organization based on the law and on company needs, and then implementing those programs. In order for a safety management system to offer benefits to the company, every level of the management and executive team needs to be involved, according to the Occupational Safety and Health Administration. One of the ways to get management involved is to explain the benefits of safety management.

Improve Morale

- When a company focuses on creating a safer workplace, employees benefit. According to the "Safety & Health Management Systems e Tool" on the Occupational Safety and Health Administration website, attention to safety management results in higher employee morale. When employees feel safer at work there is less turnover, which means the company saves money on having to hire and train new employees. There is also less absenteeism as well as an increase in productivity.

Lower Insurance Costs

- Focusing on workplace safety through a safety management program can help reduce insurance costs, according to the Rochester Institute of Technology. Discuss your company's safety management program with your insurance agent to see what steps should be taken to lower the cost of your company's liability insurance, and if offering a safer workplace can help lower the cost of your company's health insurance premiums as well.

Foster Competitiveness

- Developing a good safety record can result in competitive advantages for your company. A safer work environment may be more appealing to talented workers in your industry, and it may help you to hire more qualified candidates than your competition. When workplace safety increases, employee productivity increases. With increased productivity comes the ability to produce more product and generate more revenue.

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