

Strengthening Workplace Safety through Practical Job Safety Analysis and Hazard Control

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Abstract: *Each & every day Number of People injured or killed in industries due to not taking adequate measure to control Hazard. Hazard is a source or situations that have potential to cause harm of people or Environment or property or combination of these. Numbers of Techniques and procedures used to identify hazard in which one most important Technique is Job Safety Analysis. Effective job safety Analysis procedures help to identify hazard and control them. Effective hazard identification procedures always help to control risk at work place. The paper indicated the positive impacts to prevent future harm to identify hazard in sub activity to break a particular activity of any process or construction / manufacturing industries, Ensuring control measure and implementing them to reduce any types of harm. It focuses to hazard and control measure.*

Keywords: job safety analysis, workplace risk, hazard control, industrial safety, preventive measures, Hazard identification & Control Procedures, Risk Management

1. Introduction

A Job Safety Analysis or Job hazard Analysis (JSA or JHA) is a procedure that helps integrate accepted safety and health principles and practices into a particular task or job operation. In a JSA, each basic step of the job is to identify potential hazards and to recommend the safest way to do the job. Other terms used to describe this procedure are job hazard analysis (JHA) and job hazard breakdown. Some individuals prefer to expand the analysis into all aspects of the job, not just safety. This approach is known as total job analysis. Methodology is based on the idea that safety is an integral part of every job and not a separate entity. In this document, only health and safety aspects will be considered. The terms 'job' and 'task' are commonly used interchangeably to mean a specific work assignment, such as 'operating a grinder', 'using a pressurized water extinguisher,' or 'changing a flat tire'. JSAs are not suitable for jobs defined too broadly, for example, 'overhauling an engine'; or too narrowly, for example, 'positioning car jack.'

The precept behind using JSA /JHA is that fatalities, accidents, and injuries can be reduced by working together and sharing safety knowledge. JSA/JHA is a basic approach to developing improved accident prevention procedures by documenting the first-hand experience of workers and supervisors and, at the same time, it tends to instill acceptance through worker participation. JSA/JHA can be a central element in a safety program; and the most effective safety programs are those that involve employees. Each worker, supervisor, and manager should be prepared to assist in the recognition, evaluation, and control of hazards. Worker participation is important to efficiency, safety, and increased productivity. Through the process of JSA/JHA, these benefits are fully realized. This process can begin by

- Involving employees/ workers participation.
- Reviewing accident history
- Conducting a preliminary job review
- Listing, ranking, and setting priorities for hazardous jobs
- Outlining the steps or tasks

Job Safety Analysis, commonly known as JSA and also called Job Hazard Analysis (JHA), is a process used to determine the hazards of, and safe procedures for, each step of a job. A specific job, or work assignment, can be separated into a series of relatively simple steps. The hazards associated with each step can be identified and solutions can be developed to control each hazard.

2. Benefits of Doing a Job Safety Analysis

One of the methods used in this example is to observe a worker actually perform the job. The major advantages of this method include that it does not rely on individual memory and that observing or performing the process prompts the recognition of hazards. For infrequently performed or new jobs, observation may not be practical. One approach is to have a group of experienced workers and supervisors complete the analysis through discussion.

An advantage of this method is that more people are involved in a wider base of experience and promoting a more ready acceptance of the resulting work procedure. Members of the health and safety committee must also participate in this process. Initial benefits from developing a JSA will become clear in the preparation stage. The analysis process may identify previously undetected hazards and increase the job knowledge of those participating. Safety and health awareness is raised, communication between workers and supervisors is improved, and acceptance of safe work procedures is promoted.

A JSA, or better still, a written work procedure based on it, can form the basis for regular contact between supervisors and workers. It can serve as a teaching aid for initial job training and as a briefing guide for infrequent jobs. It may be used as a standard for health and safety inspections or observations. In particular, a JSA will assist in completing comprehensive accident investigations.

3. Method/ Procedure/ Recommendation

To perform a JSA/JHA, the following question should be asked:

- What can go wrong?
- What are the consequences?
- How could it happen?
- What are the contributing factors?
- How likely is it that the hazard will occur?

The answers to these questions will help in hazard identification.

a) What are the four basic steps?

Four basic stages in conducting a JSA are:

- Selecting the job to be analysed
- Breaking the job down into a sequence of steps
- Identifying potential hazards
- Determining preventive measures to overcome these hazards

b) What is important to know when 'selecting the job'?

Ideally, all jobs should be subjected to a JSA. In some cases there are practical constraints posed by the amount of time and effort required to do a JSA. Another consideration is that each JSA will require revision whenever equipment, raw materials, processes, or the environment change. For these reasons, it is usually necessary to identify which jobs are to be analysed. Even if analysis of all jobs is planned, this step ensures that the most critical jobs are examined first. Factors to be considered in setting a priority for analysis of jobs include:

- **Accident frequency and severity:** Jobs where accidents occur frequently or where they occur infrequently but result in serious injuries.
- **Potential for severe injuries or illnesses:** The consequences of an accident, hazardous condition, or exposure to harmful products are potentially severe.
- **Newly established jobs:** Due to lack of experience in these jobs, hazards may not be evident or anticipated.
- **Modified jobs:** New hazards may be associated with changes in job procedures.
- **Infrequently performed jobs:** workers may be at greater risk when undertaking non-routine jobs, and a JSA provides a means of reviewing hazards.

(c) How do I break the job into basic steps?

After a job has been chosen for analysis, the next stage is to break the job into steps. A job step is defined as a segment of the operation necessary to advance the work. Care must be taken not to make the steps too general. Missing specific steps and their associated hazards will not help. On the other hand, if they are too detailed, there will be too many steps. A rule of thumb is that most jobs can be described in less than ten steps. If more steps are required, you might want to divide the job into two segments, each with its separate JSA, or combine steps where appropriate. An important point to remember is to keep the steps in their correct sequence. Any step which is out of order may miss serious potential hazards or introduce hazards which do not actually exist. Each step is recorded in sequence. Make notes about what is done rather than how it is done. Each item is started with an action verb. Job steps are recorded in the left hand column.

This part of the analysis is usually prepared by knowing or watching a worker do the job. The observer is normally the immediate supervisor. However, a more thorough analysis often happens by having another person, preferably a member of the health and safety committee, participate in the observation. Key points are less likely to be missed in this way.

The job observer should have experienced and be capable in all parts of the job. To strengthen full co-operation and participation, the reason for the exercise must be clearly explained. The JSA is neither a time and motion study in disguise, nor an attempt to uncover individual unsafe acts. The job, not the individual, is being studied in an effort to make it safer by identifying hazards and making modifications to eliminate or reduce them. The worker's experience contributes in making job and safety improvements. The job should be observed during normal times and situations. For example, if a job is routinely done only at night, the JSA review should also be done at night. Similarly, only regular tools and equipment should be used. The only difference from normal operations is the fact that the worker is being observed. When completed, the breakdown of steps should be discussed by all the participants (always including the worker) to make that all basic steps have been noted and are in the correct order.

(d) How do I "identify potential hazards?"

Once the basic steps have been recorded, potential hazards must be identified at each step. Based on observations of the job, knowledge of accident and injury causes, and personal experience, list the things that could go wrong at each step. A second observation of the job being performed may be needed. Since the basic steps have already been recorded, more attention can now be focused on each potential hazard. At this stage, no attempt is made to solve any problems which may have been detected. To help identify potential hazards, the job analyst may use questions such as these:

Can any body part get caught in or between objects?

- Do tools, machines, or equipment present any hazards?
- Can the worker make harmful contact with moving objects?
- Can the worker slip, trip, or fall?
- Can the worker suffer strain from lifting, pushing, or pulling?
- Is the worker exposed to extreme heat or cold?
- Is excessive noise or vibration a problem?
- Is there a danger from falling objects?
- Is lighting a problem?
- Can weather conditions affect safety?
- Is harmful radiation a possibility?
- Can contact be made with hot, toxic, or caustic products?
- Are there dusts, fumes, mists, or vapours in the air?

Potential hazards are listed in the middle column of the worksheet, numbered to match the corresponding job step. For example: Again, all participants should jointly review this part of the analysis.

(e) How do I “determine preventive measures?”

The final stage in a JSA is to determine ways to eliminate or control the hazards identified. The generally accepted measures, in order of preference, are:

Eliminate the hazard: Elimination is the most effective measure. These techniques should be used to eliminate the hazards:

- Choose a different process
- Modify an existing process
- Substitute with less hazardous product
- Improve environment (e.g., ventilation)
- Modify or change equipment or tools contain the hazard

If the hazard cannot be eliminated, contact might be prevented by using enclosures, machine guards, worker booths or similar devices.

- **Revise work procedures:** Consideration might be given to modifying steps which are hazardous, changing the sequence of steps, or adding additional steps (such as locking out energy sources).
- **Reduce the exposure:** These measures are the least effective and should only be used if no other solutions are possible. One way of minimizing exposure is to reduce the number of times the hazard is encountered. An example would be modifying machinery so that less maintenance is necessary. The use of appropriate personal protective equipment may be required. To reduce the severity of an incident, emergency facilities, such as eyewash stations, may need to be provided.

In listing the preventive measures, do not use general statements such as “be careful” or “use caution”. Specific statements which describe both what action is to be taken and how it is to be performed are preferable. The recommended measures are listed in the right hand column of the worksheet, numbered to match the hazard in question.

(f) How should I make the information available to everyone else?

JSA is a useful technique for identifying hazards so that workers can take measures to eliminate or control hazards. Once the analysis is completed, the results must be communicated to all workers who are, or will be, performing that job. The side-by-side format used in JSA worksheets is not an ideal one for instructional purposes. Better results can be achieved by using a narrative-style communication format.

4. Consider Human Problems in the JSA/JHA Process

While working with the middle column, “Potential Accidents or Hazards,” we also need to consider the following points related to human problems:

- What effects could there be if equipment is used incorrectly?
- Can the worker take shortcuts to avoid difficult, lengthy, or uncomfortable procedures?

Normally, the job steps for a JSA/JHA are listed in logical sequence. Some workers, however, may wish to change the sequence for one reason or another. For example, one operator may choose to check fluid levels before he does a

general walk-around. This type of flexibility is good for worker morale and productivity. However, on the other hand, there are times when the sequence of the job steps or deviations from the job steps are critical to safe performance of the job. An example of this is that the walk around inspection must be made and safety deficiencies corrected before the machine is put into service for the day. It would not be safe or proper to do the walk-around inspection after the machine has been put into service.

Job Safety Analysis Worksheet

Sequence of basic job steps	Potential Accidents or Hazards	Recommended Safe Job Procedures

5. Conclusion

Job Safety Analysis (JSA) is a useful technique to identify hazards so that employees can take measures to control Risk. Once the analysis is completed, the results must be communicated to all employees who are, or will be, performing that job. It will help to aware employees and taking control measure as per JSA document. This Technique is most effective because we identify hazard sub-activity wise of selected activity and control risk on based on identification. Hazard may be control to eliminate them and if cannot be eliminated, then it might be prevented by using enclosures, machine guards, worker booths or similar devices. So, Job Safety Analysis (JSA) techniques play major role to prevent future injury or losses to identify hazard in proper manner and controlling them.

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