

Human factors publications explain how the different aspects of a workplace, such as people, procedures, facilities, and equipment, interact to influence worker actions and decisions. Identifying these factors provides an understanding of workplace risks and can help prevent similar incidents.

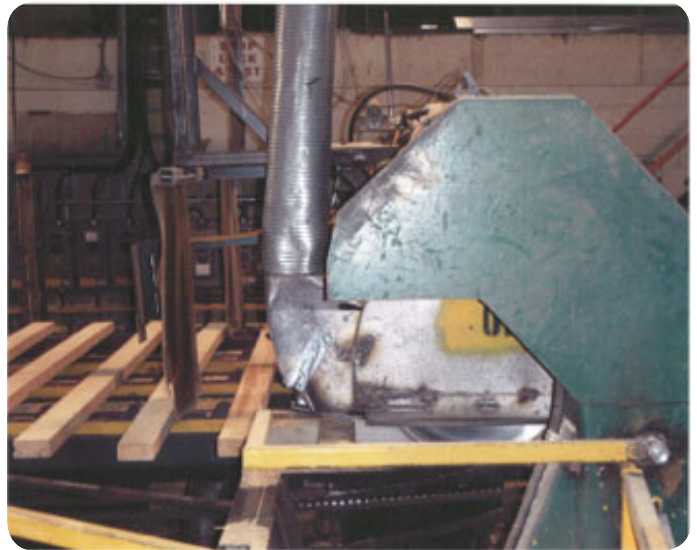
Asking questions from a human factors perspective

This bulletin will help employers understand the deeper issues surrounding the entire work environment. This is accomplished by asking questions that explore how and why work is conducted the way it is. Effective questions help determine how workers are influenced by workplace factors; they look beyond just the immediate actions and decisions of front-line workers.

The incident

A worker at a sawmill was doing routine start-up and tidying tasks to prepare for the next shift. While doing these tasks, he noticed that the dust collection pipe for the trim saw was clogged with wood debris. With the saw still running, the worker removed the exhaust pipe and noticed slivers sticking out of the connection. He took out one wood sliver but saw more lodged in the opening. He reached to remove one of them but at that moment the sliver was pulled into the saw. As a result, the worker's hand was drawn into the opening of the pipe, where his gloved fingers contacted the moving saw blade inside, causing him serious injury.

The employer's early determination was that the worker had not locked out the saw.



The dust collection pipe

From a human factors perspective, why did it happen?

Human factors experts asked the following questions to help clarify the context and explore what may have influenced the worker to take the actions he did, as well as to gain further understanding of the work:

- Where and how does the pipe clog? What size of debris is causing the clogs?
- How often does the pipe clog?
- Is removal of clogs urgent?

- How do workers currently remove clogs from the pipe?
- Is there a safe work procedure for handling clogs in the pipe?
- Is lockout required each time clogs need removing?
- Are there any differences between the current practice and what is outlined in the procedure? If there are differences, what are they?
- Are clogs recorded and reported? If so, how?

In this case, safety regulations required the worker to de-energize and lock out the saw before doing any maintenance work on it, including clearing the clogged debris. Taking the human factors approach and asking the above questions to gain a better understanding, experts learned that it was common at the workplace for the dust collection pipe to get clogged with sawdust and wood slivers. Often workers were able to fix the clog by just banging on the pipe to loosen the debris. This worker had cleared such jams many times before by pulling slivers away from the pipe connection opening and had not been injured. In this case, however, the first slivers the worker pulled out were not close to the saw blade and so he didn't realize that the larger sliver **was** entangled in the saw. Lacking this knowledge, he believed it was safe to remove it just as he had the others.

Understanding human factors helps avoid workplace accidents.

Using the information provided by the human factors approach to the incident, the employer could take effective steps toward preventing similar incidents.

Changes that could be considered include:

- Change the design of the pipe so it clogs less often.
- Understand when and why workers are using their own problem-solving techniques to cope with production interferences or challenges.
- Develop a procedure or guide on how to deal with jams safely.
- Conduct regular training sessions.