

Operational Definitions: When it comes to safety does your company have ‘failure to communicate’?

By Thomas A. Smith

"In my opinion, the Sago Mine was a safe operation," statement from the chief executive of International Coal Group Inc. after the Sago mine disaster in which 12 miners perished.

On October 15, 1970, the West Gate Bridge

in Melbourne, Australia collapsed, killing 35 construction workers. The subsequent enquiry found that the failure arose because engineers had specified the supply of a quantity of *flat steel plate*. The word *flat* in this context lacked an operational definition, so there was no test for accepting or rejecting a particular shipment or for controlling quality.

"In the opinion of many people in industry, there is nothing more important for transactions of business than the use of operational definitions. It can also be said that no requirement of industry is more neglected." W. Edwards Deming

Operational definitions are a requirement not well understood and woefully underutilized in safety. In business there have many instances of miscommunication that cause serious problems especially when it comes to safety. Many accidents could be avoided simply by using them. Unfortunately this important requirement is not used by management, regulators, suppliers and workers

We try to understand words by defining them. But defining a word doesn't guarantee everyone agrees on its meaning. But if we use an *operational definition* the meaning of a concept or word, especially adjectives, mean the same to everyone involved. To prevent injuries we need to specify in advance in meaningful terms and measurements of what does it mean to be *safe*. An operational definition is not what you intended but what you actually receive. ¹

A correctly formulated operational definition enables all of the people involved to use and understand a term in exactly the same way today, tomorrow and thereafter. This is especially important when it comes to safety. An operational definition will provide consistent understanding of the word *safe*. Some of the best example of operational definitions are recipes in a cookbook. ²

Safety is made at the top of an organization. That means a company can be no better at safety than the intention and actions of top management. When the President or CEO of a company states she wants all employees in the company to be *safe* she is declaring her intention. But top management declaring its intentions of having a *safe* workplace isn't enough. Everyone in the organization must have the same understanding of *safe*.

When the President of a company issues a safety policy statement that says she wants all employees to be "safe" it means one thing to her but can and often does mean something different to everyone else. The underlying assumption is she does not want any employee to be injured. An operational definition is not what she intended but what is received.

The problem is, we may not have clue what she means. What does the word "safe" mean at the time you are using it and in the future? We could look up "safe" in a dictionary to define it so we will know what we are talking about. But that doesn't mean everyone would agree what "safe" means in concrete situations. Safety is a moving target. For example one dictionary definition of "safe" is: "*not dangerous, unlikely to cause or result in harm, injury or damage.*" What does "not dangerous" mean? What does "unlikely" mean? Would this definition of "safe" have the same meaning during a time of urgency to a Vice President in the organization? A foreman? An hourly worker? In all likelihood it would not. We have a tendency to redefine

terms as situations change. And situations about safety change moment to moment depending on the pressure of production. The challenge is always, how can we measure the safety of a job?

The customer principle requires operational definitions

“If I had asked my customers what they wanted they would have said, ‘A faster horse.’
Henry Ford

The “operational definition” of “safe” is what actually happens in work systems. Not what top management or anyone else intended while talking about safety sitting behind a desk far removed from daily work routines. Operational definitions will result in specification, rule or regulation to have the same meaning for two or more people today and in the future. They link what I see to what you see. They are vital for linking the Voice of the Customer to the Voice of the Process. When a business loses sight of the Voice of the Customer or cannot meet the needs of the customer there will be a gap. The size of the gap can cause small to very large and serious safety problems.

Safety management has been slow to recognize its ultimate role and purpose is to serve customers. A customer is defined as anyone who benefits from your product or service. All companies have both internal and external customers. In business you depend on someone to do something for you and someone depends on you to do something for them. You are always at some point of the input-process-output cycle. This means at any given time you are either a supplier or a customer.

The main customers for safety management are hourly workers and their families. They ultimately reap the benefits of safety in the system delivered by management. These include designing jobs so workers cannot be hurt when doing them; providing effective safety training; machine guarding; data analysis and synthesis; education and leadership to name just a few.

Managers believe meeting safety rules and regulations is all that is necessary to make a job safe. They also believe asking employees for safety suggestions is a good safety practice. They miss the point. The fact is customers, in this case workers, don't know what they need. They only know what to expect. A customer's need is a problem or challenge for which presently there is no known solution.

Henry Ford and Steve Jobs were masterful at anticipating the need(s) of their customers. Who asked for a car that was affordable? ABS brakes on a car? A child safety seat? Safety light curtains on a punch press? The I-Phone? Customers had a problem or challenge and a solution was developed by the supplier. Once the solution is delivered it becomes the customer's expectation. In the 1950's seatbelts and air bags didn't exist in cars. Today what parents would drive their infant children and not buckle them in a child car seat? Doing so would not be considered *safe!*

Management must work to ensure the Voice of the Process matches the Voice of the Safety Customer. *The safety customer is the worker doing the job. Management and workers want every job to be “safe.”* But what does safe mean? If you ask workers, How many accidents they want to have at work?, they will say “zero.”

Workers are the Voice of the Customer for safety. The Voice of the Process then provides the criteria to measure and determine if the operations are safe. Contrary to well-intentioned management policy statements no system no matter what the effort put into it will be totally free of accidents. That doesn't mean safety is an exercise in futility but it presents a unique challenge for management. The chart below shows what the work system is not capable of delivering zero accidents. Actually these are not accidents, which are unintended or unforeseen events. Whatever this process is it produces injuries to workers at a rate ranging from 2.0 to 5.0 every month.

Voice of the Safety Customers, Management and Workers desire Zero Accidents

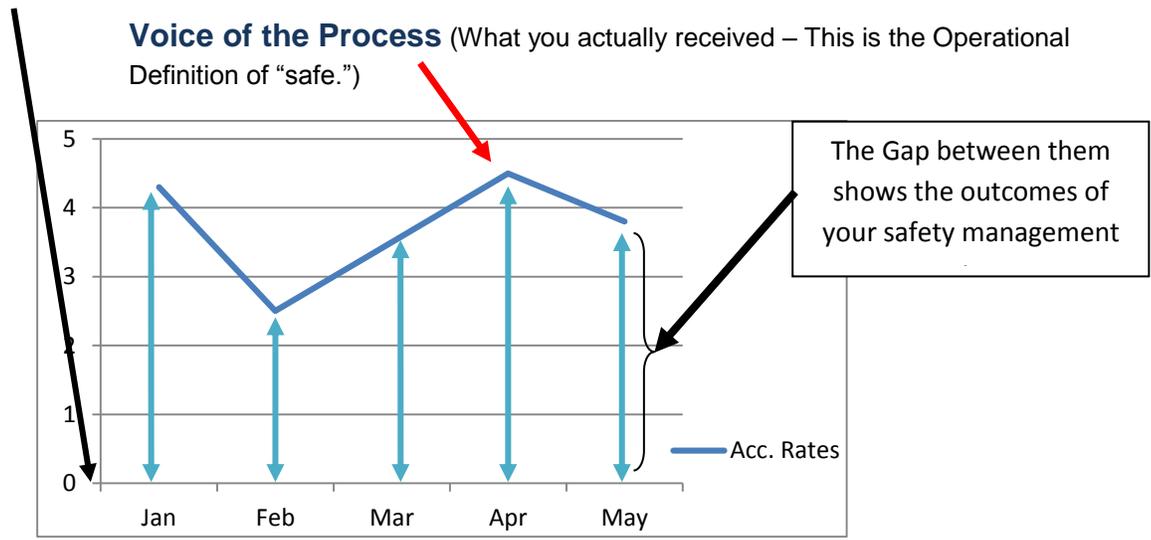


Figure 1 An operational definition is not what you intended but what you actually received.

Remember the operational definition of “safe” is not what you intended but what you actually receive. The data shows a gap between the Voice of the Safety Customer who wants zero accidents and the Voice of the Safety Management System (Fig. 1), i.e. how safety is actually managed and how many accidents/first aid injuries actually occur over time. The data in Figure 1 shows a gap between the two and closing that gap is what everyone must work on. The work system/process is not safe.

How to create an operational definition

Here is an example of how to create an operational definition.

An Operational Definition has the following elements:

State the purpose for making the operational definition. What is the safety issue and purpose for making the operational definition.

Criterion (or criteria): The standard against which to evaluate the results of the test. Safety specifications are often about performance

Test method: A specific procedure for measuring a characteristic.

Decision: Yes or No decision the test results show the characteristic does or does not meet the criterion.

Always start with asking, What is the purpose for making your operational definition? Ask a group of people what is a “Good” restaurant? The response will vary depending what they hold to be important. Some may value the service, the price as much as the taste of the food. Some may want a kids menu. Change the purpose and the results will change.

A different purpose will result in different criterion. We might want to define if a table is clean. First we must determine: What is the purpose for you asking? Clean for what? Eating a picnic lunch? Or making computer discs? The results will change depending on your purpose. The following is an example of to make an operational definition to determine if a job is safe.

Start with a question: Is the widget job safe?

Then state the purpose: The purpose of this operational definition is to determine if workers can perform the widget operation with no (zero) eye injuries. We are only going to measure eye injuries that occur in this operation not back strains, lacerations, etc. A supervisor may believe zero clinic visits means the job is safe. But employees may be experiencing discomfort to their eyes but continue to work and eventually incur serious pain. They would not agree with the supervisor.

Criterion or Criteria: 1.) Employees will not experience any discomfort to the eyes while performing the widget job. 2.) No (zero, nada, none) foreign particles or vapors will enter the workers eyes.

Describe the method to be employed to perform the test (This is the recipe.):

1. We will conduct a daily survey and ask all of the workers who work on the widget job about any discomfort to their eyes while performing the job. Their feedback will be recorded on a check sheet. Any instances on the First Aid log will be added to any instances of discomfort check sheet.
2. We will count the number of first aid cases of injuries on the first aid log.
3. We will count the number of foreign body in the eye injuries on the OSHA log.

Make a judgment: State Yes or No if the criteria was met. In our example if you completed the test and no FBE injuries were recorded on either the OSHA log or First Aid Log and no discomfort to the eyes was revealed in the survey of the workers then the answer would be “Yes” to this point in time the widget job is safe for working without any FBE injuries. If any subsequent FBE injuries or discomfort is found or reported then the answer is at that point in time the answer changes and “No” the widget job is not “safe.” Note that an operational definition does not provide a solution to the problem. It will tell us a safety problem exists and no one involved could disagree.

If it is determined there is an eye injury problem a team with knowledge about common and special causes would determine how to react. If the problem stems from common cause i.e. something in the system, a team may work the Plan, Do, Study and Act cycle to dissolve the problem.

Where should safety start using operational definitions?

A company’s safety program often starts by publishing safety rules and regulations. What is a “god” safety policy statement? Below are typical suggestions to management for writing a Safety Policy Statement.³

“The policy statement should provide a clear indication of the company's objectives and plans for occupational health and safety. The following issues should be covered in the statement:”

- senior management's commitment to the establishment of a healthy and safe workplace and to the integration of health and safety into all workplace activities,
- the intention to treat basic safety and health legislation as a minimum standard rather than maximum,
- responsibility of all personnel in maintaining a safe workplace,
- accountability of all levels of management for carrying out health and safety responsibilities,
- importance of consultation and co-operation between management and employees for effective implementation of policy,

- commitment to regular reviews of the policy and to monitor its effectiveness, and
- commitment to provide adequate funds and details of how money will be available.

In all of these instances what does commitment mean? What is an effective implementation of policy? What does it mean to say “the intention to treat basic safety and health legislation as a minimum standard?” How much are “adequate funds?” What does “regular reviews” mean? If everyone is to be held responsible/accountable then no one is responsible/accountable. What does “co-operation between management and employees” mean? We can only surmise these kinds of safety policy statements are meaningless. They can mean many different things to many different people. Incredibly this is a typical model for writing a safety policy statement.

Conclusion

“NASA’s initial briefings to the Board on its safety programs espoused a risk-averse philosophy that empowered any employee to stop an operation at the mere glimmer of a problem. Unfortunately, NASA’s views of its safety culture in those briefings did not reflect reality,” From the Columbia Accident Investigation Report, p. 177.

Management must learn when to use and how to create operational definitions. Until this happens we will continue to ignore the Voice of the Safety Customer and rely instead on safety specifications that are often meaningless. Everyone in an organization must understand what it means to say, “Our operations will be *safe*, not only today but in the future.”

Operational definitions are a requirement for providing communicable meanings for adjectives such as round, reliable and safe. Unfortunately the idea that perception is reality does not compute when it comes to safety. The Columbia accident is a tragic example of what happens when this takes place. Management may have the perception that issuing a safety policy statement, complying with safety laws, company rules, holding everyone accountable and a good dose of common sense means the company is *safe*. For obvious hazards these may get you something. But without a healthy appreciation of operational definitions you won’t be able to make a valid judgment about whether any operation is truly “safe.”

To learn more about how your company can use operational definitions and manage your safety program for continual improvement contact *Thomas A. Smith* (Smitty) at Mocal, Inc. Mr. Smith works with management and hourly employees to help them learn about new theory of management to obtain team skills and work on culture change. His book; *System Accidents: Why Americans Are Injured At Work And What Can Be Done About It* has received high praise and can be obtained at Amazon.com. He can be reached at tsmith@mocalinc.com or his company website at www.mocalinc.com or (248) 391-1818.



¹ Deming, W. Edwards, *Out of the Crisis*, MIT 1986, p. 277, *The New Economics*, p 105

² Hayakawa, S.I., *Language in Thought and Action*, 1964, P. 184

³ Guide to Writing an OHS Policy Statement: www.ccohs.ca/oshanswers/hsprograms/osh_policy.html