

Best Practice Brief

Quantifying Safety Performance

Our Best Practice series is based on the belief that the best way for our customers to continuously improve their safety process is to learn from the experience of users like themselves. The following brief focuses on the quantification of safety performance.

QUANTIFYING SAFETY PERFORMANCE WITH SAFETYNET

Being able to **quantify safety performance** is one of the most important benefits for *SafetyNet* users. The ability to measure safe and unsafe conditions or behaviors, to track leading risk indicators over time and to monitor utilization of the *SafetyNet* service allows organizations to objectively assess safety performance with an eye toward quality, rather than quantity. The resulting measurements play a critical role in appropriately targeting training resources, validating safety improvements and fairly compensating individual performance.

FOCUSING RESOURCES AND MEASURING IMPROVEMENT

Safety Director Dave Murphy, of Pepper Construction Company of Indiana, knows first-hand the value of being able to put a number to a problem: “We know that fall protection is a big problem in our industry, but until we had DBO² *SafetyNet*, we never realized the magnitude of the problem within our own organization. We didn’t have a way to index it. Once we implemented *SafetyNet*, our safety committee took the information generated and ran with it. We did a safety seminar on fall-protection, featured it in our newsletter and raised company awareness. Now we’re able to measure and see if these actions have produced positive results.”

In another instance, being able to measure positive results helped to reinforce the benefits of good safety. “We had problems with eye injuries on the job, so we went to 100% use of safety glasses. After three months of implementing 100% use of safety glasses, the incident rate for eye injuries was reduced by 2/3,” says Murphy. During this time, *SafetyNet* was used to measure the improvement in safety performance, while also validating the link between greater participation in the eye protection program and achievement of a reduction in injuries.

In short, Murphy staunchly believes that “what gets measured gets done.” “*SafetyNet* provides a very comprehensive and detailed measurement of what happens on our jobsite. It has changed our whole outlook on safety and involvement from the foreman level all the way up to project executive,” says Murphy.

ESTABLISHING STANDARDS AND REINTERPRETING DATA TO CREATE MORE ACCURACY

On the *SafetyNet* application, unsafe observations can be classified as being of low, medium, high or life-threatening severity. But this determination is made by individual users, who may or may not provide more details in a text field for comments.

In an effort to eliminate as much subjectivity as possible, Murphy created a Severity Classification matrix so that *SafetyNet* users would have no question as to how to classify an unsafe observation. Murphy’s Severity Classification matrix (see excerpt below) consists of eight pages that detail the types of unsafe observations and the conditions under which they would be ranked as low, medium, high or life-threat, thereby eliminating any indecision on the part of users. By standardizing the units of measure for severity level, he is helping users to homogenize the data and to cull more consistency, quality and meaning from the collected information.

FALL PROTECTION	BASIS	LOW	MEDIUM	HIGH	LIFE THREAT
Exterior/interior guardrails	1/8’ wood or 1/15’ cable		Guardrail not flagged, toeboard missing	Unsafe Condition	Guardrail missing
Fall protection at 6’	1/man			Unsafe Condition	> 6’ exposure
Fall protection plan	1/con		No plan		
Floor/wall opening protected	N/a				
Floor covers adequate, secure, labeled	1/cover		Label missing	Cover not secured	> 6’ exposure
Proper anchorage points	1/man			Improper use	> 6’ exposure
Roof edge protected	1/8’ wood or 1/15’ cable		Spacing, height	Repair	> 6’ exposure
Safety harness and lanyard	1/man		Inspection	Improper use	> 6’ exposure
Stair/ramp/walkway protected	1/stair		Repair	Unsafe Condition	> 6’ exposure

Excerpt from the Severity Classification matrix, for the category of Fall Protection. The Basis helps users determine the number of safe or unsafe observations to count.

Defining standards was just one part of the equation though. To create a more exact representation of safety performance, Murphy devised a formula to assign a higher weight to high and life-threat severity in unsafe observations, to more accurately depict the true severity of unsafe conditions in each safety category. The formula, called the Severity Index, is obtained by taking the total high and the life-threatening observations, dividing the sum by the total number of observations and multiplying that by 1000. When the Severity Index is subtracted from the percentage of safe observations, it yields a calculation called Safety Points (see sample below), which presents a more accurate gauge of safety performance—one that takes into account the considerably greater impact of high and life-threat severity observations.

PROJECT TEAM	INSPECTIONS	OBSERVATIONS	UNSAFE CONDITIONS	% SAFE	UNSAFE CONDITIONS				SEVERITY INDEX	PCCI SAFETY POINTS
					LOW	MEDIUM	HIGH	LIFE THREAT		
PCCI	72	22956	1456	93.7	915	294	202	41	10.6	83.1

Sample Calculation of Safety Points. $\text{Safety Points} = \% \text{ Safe} - \text{Severity Index}$

Murphy explains: “Everybody performs 97, 98, or 99% safe, but that doesn’t tell you about the variability or spread within that range. Using the Severity Index, I can measure the variability within that range. The more high and life-threat unsafe observations you have, the higher your Severity Index will be, and consequently, the lower your Safety Points will be. Our average score for total safety performance across all categories has been running about 83%; I can apply that to the actual subcategory reports to provide meaningful data for us to interpret.”

GOOD SAFETY HAS ITS REWARDS

Standardizing and reinterpreting the measurement of safety performances has led to increased individual involvement and competencies at Pepper Construction. Because past evaluations of safety performance were time-consuming and prone to subjectivity, this new accountability presented a perfect opportunity for Murphy to link employee compensation to safety performance. “We changed our whole performance bonus structure to use *SafetyNet* measurements to determine the annual component of safety bonuses.”

The Safety Points that can be calculated for each category can also be calculated and assigned for each employee who uses *SafetyNet*. Individually earned Safety Points correspond to a bonus percentage level that is established at the beginning of each fiscal year, which reflects the past year’s experience. Trade foremen are eligible for a quarterly safety bonus based on the cumulative score of the projects they worked on during that quarter. Foremen who earn 83 safety points or more receive a quarterly cash bonus. Project managers and superintendents can earn a safety bonus of up to 4% of their annual salary if they score between 95 to 99 safety points.

SAFETY POINTS	BONUS %	SAFETY POINTS	BONUS %	SAFETY POINTS	BONUS %	SAFETY POINTS	BONUS %
99	4	89	3.4	79	2.4	69	1.4
98	4	88	3.3	78	2.3	68	1.3
97	4	87	3.2	77	2.2	67	1.2
96	4	86	3.1	76	2.1	66	1.1
95	4	85	3	75	2	65	1
94	3.9	84	2.9	74	1.9	<65	
93	3.8	83	2.8	73	1.8		
92	3.7	82	2.7	72	1.7		
91	3.6	81	2.6	71	1.6		
90	3.5	80	2.5	70	1.5		

Safety Points determine the percent of one’s annual salary that is earned as a safety bonus.

CONCLUSION

Dave Murphy of Pepper Construction has successfully innovated techniques to extract more meaning from his data on safety performance. By establishing severity standards for unsafe observations, then appropriately emphasizing the upper range of this severity, participants generate more consistent information that is more likely to reflect the true level of safety in each category. The results lead to more targeted allocation of training resources, a qualified measurement of safety improvement and perhaps most importantly, a fair and objective manner in which to assess and reward individual safety performance.