

## USING ANSI/ASSP Z16.1 to Effectively Measure & Improve OSH Performance

By Alexi Carli and Pam Walaski

**As Peter Drucker says, “Metrics: What gets measured gets improved.” Measuring success in organizations is critical to ensure that goals are achieved. An effective set of metrics can be used to advance safety and health in an organization.**

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In the past several years, much has been published about improving the measurement of safety and health performance. Traditional lagging metrics that track incidents are not comprehensive and do not take into account the inputs and outputs of processes that lead to outcomes. The use of lagging metrics has been likened to trying to drive a car by looking in the rear-view mirror. Lagging metrics are still necessary but do not provide the means to get to a destination (Esposito, 2021). Learning is also not achieved by merely tracking incidents and failures. Measuring failures also does not align with how business measures performance.

In recent years, more emphasis has been placed on the use of leading metrics, but leading metrics alone do not highlight the full extent of problems that can be hidden by scattered metrics. Leading metrics can be used to monitor what is being done and, depending on how they are developed, can also give some indication of how well it is being done. However, leading metrics alone do not tell the whole story and do not indicate whether the desired outcome is being achieved. Leading metrics also do not measure how safety and health efforts impact the organization.

Measuring safety and health performance is not easy, and there are no quick answers. There is no single reliable safety and health metric. What is needed is a more comprehensive balanced set of metrics, which implementing the ANSI/ASSP Z16.1 standard can help organizations develop. This provides an approach that organizations can use to identify metrics that are relevant to their industry as well as their organization's specific operational risks and management challenges.

The ANSI/ASSP Z16.1 standard provides a systematic approach that evaluates key risks and safety and management system elements, and uses the interrelationships between leading, lagging and impact metrics to provide a multidimensional view of safety and health performance. This helps to understand what is happening, why it is happening and how it impacts the organization. It is important to know the level of performance as well as know why performance is at that level.

The addition of the use of impact metrics sets the ANSI/ASSP Z16.1 standard apart from other publications about metrics. Impact metrics measure the overall effect of a particular safety and health goal or initiative rather than merely tracking its progress. Impact metrics are critical to the overall objectives of safety and health because they describe the impact on the business in several ways.

1. Impact metrics help provide why goals must be achieved as they help quantify the impact on

business operations. This is important to gain the support of business and operational leaders.

2. Impact metrics help highlight safety and health's role as a strategic business partner that enables efficient business by solving problems and improving processes.

3. Impact metrics help business leaders see the connection between safety and health risks (which are wastes) and operational wastes, and how investments in reducing risk impact efficiency and service.

4. Impact metrics help promote change and improvements in safety and health by quantifying and tracking benefits and keeping that information in front of decision makers.

The ANSI/ASSP Z16.1 standard outlines a continuous improvement model that includes the steps to:

1. Identify and define a balanced set of metrics by identifying critical risk and safety and health management system improvement strategies.

2. Develop and select leading, lagging and impact metrics for the identified improvement strategies.

3. Communicate and validate key metrics to internal and external stakeholders. This helps ensure that the right information gets to the right audience to understand what needs to be improved and how, and respective roles in achieving goals.

4. Monitor and evaluate the balanced set of metrics to ensure that desired results are achieved without unintended consequences and drive continual improvement.

### Why a Balanced Approach?

Organizational processes and systems are complex, and using a balanced approach helps identify what improvements to make and how to make them. The ANSI/ASSP Z16.1 standard defines a balanced set of metrics as one that “includes leading, lagging and (where appropriate) business impact metrics, providing a concise-but-comprehensive view of performance to predict or influence outcomes” (ANSI/ASSP, 2022). Balanced metrics address risk and safety management system elements and measure outcomes with corresponding inputs and outputs of a process. A balanced approach helps highlight the change of key actions on the organization and how safety and health efforts enable efficient operations.

To conform to the requirements of the standard, a balanced set of metrics must be developed for at least one risk element attribute and one safety management system element attribute. Risk management and safety management systems have key elements that outline their respective steps and processes. Each element may have several different characteristics or attributes that

make up that element. The standard provides tables that list common elements and attributes. For instance, risk management can commonly include elements of consultation, identification, assessment and evaluation, treatment, and monitoring. Risk identification can involve the attributes of identifying hazards and evaluating the level of treatments and controls, and matching treatment and control options to the identified hazards.

It is important to align the risk elements and the safety and health management system elements. It is not enough to outline steps to manage an identified risk. The management system is key because it dictates how things get done and supports risk reduction. Setting goals without creating the support structure to accomplish them can be viewed as a wish list. The standard provides examples of both types of elements and attributes as well as example metrics in the appendix.

### Three Components of the Balanced Set

The ANSI/ASSP Z16.1 standard defines three categories of safety and health performance metrics.

1. Leading metrics: Performance measures that are capable of influencing and predicting results (outcome/lagging or business impact metrics) and are often aimed at the prevention and control of future events or results.

2. Lagging metrics: Performance measures that represent the consequences of actions previously taken or not taken (sometimes referred to as an outcome or trailing metric). Lagging metrics frequently focus on results at the end of a period and characterize historical performance.

3. Impact metrics: Measures that reflect the organizational impact of safety-and-health-related programs, policies and activities. These measures can represent the impact on finances, productivity, reputation, quality or worker morale, among other aspects.

The selection of the balanced set starts with the goals to be achieved that are the lagging metrics. Then, actions (system inputs and outputs) are identified that help reach the goals that are the leading metrics. These include both risk elements and safety

and health management system elements. Impact metrics are added because they highlight the organizational effects of goal achievement and help stakeholders understand why goals need to be achieved.

The standard provides a robust appendix with additional information and many different types of examples. Table 1 provides an example in a warehousing operation.

### Implementation Strategies

For many years, OSH professionals have maintained that lagging metrics demonstrate the success (or failure) of an OSH program. Recent research has challenged that concept, at least for the most commonly referenced lagging metric, the total recordable incident rate (TRIR; Hallowell et al., 2021). And, while many OSH professionals have gravitated to leading metrics as a way of encouraging proactive measures, there is no standard definition that can be used to develop and implement them, which has led to a wide variety of understandings about what they are and how they can be used effectively (Walaski, 2020).

While the framework and iterative process for measuring OSH performance in an organization outlined in ANSI/ASSP Z16.1 is a significant improvement, it is also a substantial departure from the metrics and processes most organizations are using, leading to an implementation gap that will not be easy or quick to close. Because the previous processes are so ingrained in the way organizations function, transitioning to a balanced approach will take time, effort and some effective communication on the part of OSH professionals. The authors recommend a transition plan that includes the following:

1. While it may sound simple, obtaining and becoming intimately familiar with the ANSI/ASSP Z16.1 standard is the first step. The requirements of the standard comprise just 18 of the document's 104 pages, but the appendixes with their examples and lists of possible leading, lagging and impact metrics provide a road map for the first steps of implementation.

Organizational processes and systems are complex, and using a balanced approach helps identify what improvements to make and how to make them.

TABLE 1

## WAREHOUSING OPERATION: POWERED INDUSTRIAL TRUCK OPERATION HAZARD

Question to answer	Lagging	Leading	Impact
Risk: exposure to serious powered industrial truck (PIT) incidents	<ul style="list-style-type: none"> <li>•PIT incident rate</li> <li>•pedestrian injury rate</li> <li>•customer product damage claim rate</li> </ul>	<ul style="list-style-type: none"> <li>•% PIT equipped with pedestrian detection and speed monitors</li> <li>•% conformance to pedestrian walkways and "no zones"</li> <li>•% aisles equipped with racking guards</li> </ul>	<ul style="list-style-type: none"> <li>•cost per workhour</li> <li>•cost per PIT</li> <li>•reduced racking damage</li> <li>•reduced product damage</li> <li>•increased product picks per PIT operator</li> </ul>
Effectiveness of management system <ul style="list-style-type: none"> <li>•worker engagement</li> <li>•management resources</li> <li>•change management</li> </ul>	<ul style="list-style-type: none"> <li>•PIT incident rate</li> <li>•pedestrian injury rate</li> <li>•customer product damage claim rate</li> </ul>	<ul style="list-style-type: none"> <li>•% PIT operator intervention based on risks and recorded events</li> <li>•% PIT operator certification</li> <li>•% PIT route planning software deployed to reduce aisle congestion</li> </ul>	<ul style="list-style-type: none"> <li>•cost per workhour</li> <li>•cost per PIT</li> <li>•reduced racking damage</li> <li>•reduced product damage</li> <li>•increased product picks per PIT operator</li> </ul>



This approach involves using a balanced and interrelated set of leading, lagging and impact metrics to measure OSH performance more effectively and help achieve an organization's strategic objectives.

2. Because this transition will likely be complex and because the collaboration of all stakeholders is key to its success, OSH professionals should assemble a transition team that represents all levels of the organization and help them understand the framework. This may require facilitated discussions and presentations with the goal of having the team understand the need for change and become advocates of it, the latter being a critical component of eventual success, as this must be recognized as an organizational change, not just a new initiative to be rolled out by the OSH department.

3. The team must work together to develop a detailed transition plan that not only includes the identification of new programs and processes to measure, but also includes a communication strategy to the broader organization about why the balanced approach is a substantial improvement over what has been done in the past. It will likely be more effective in the early stages of the rollout to consider smaller steps such as a pilot in one area, process or department of the organization rather than trying to remove and replace everything that has been done in the past (see Step 5). Rather than trying to jettison older lagging and leading metrics, it is recommended to leave them in place during the transition and redirect the focus by increasing attention and socialization of the newer methods. (Note that tracking, recording and reporting on incidents required by OSHA remains a regulatory requirement, and insurance carriers will continue to calculate experience modification rates to set premiums, both of which are widely used by clients, vendors and other external organizations for benchmarking and proposal submission processes.)

4. To ensure that the balanced approach is fully realized, the organization must first have some consensus on what the most significant risks are as well as the recent completion of a gap analysis or some

type of evaluation of the current management system. Both of these provide the critical information needed to select key elements and attributes to measure to be able to demonstrate that implementing a new program or revising a process results in risk reduction and is supported by management system improvement. As noted in the standard, many data points and sources can help with this step, including risk assessments, loss analyses, hazard control evaluations and conformance rates as well as some type of regular review of the management system and analysis of whether it is achieving its intended outcomes.

5. As the transition team readies its first foray into the balanced approach, asking questions such as "what program or process are we trying to improve?" or "what new programs are we getting ready to implement?" will aid in identifying the first small step into the transition. Locating a department or defined process area where a pilot can be launched is important, as is looking for a place to start where the changes are more likely to be embraced. The overall goal is a successful first launch, so starting small and where you are welcomed are key. Once the first or second pilot has been tested, the process can be reviewed and refined before expanding to a broader part of the organization until the full transition is completed. Note that this can take several years depending on the size of the organization, the complexity of its processes and the support (or lack thereof) of senior leaders.

## Conclusion

The publication in April 2022 of ANSI/ASSP Z16.1-2022 represented nearly 5 years of work by the subject matter experts of the committee and involved not just the revision of a previous standard, but a completely new approach to measuring OSH performance. This approach involves using a balanced and interrelated set of leading, lagging and impact metrics to measure OSH performance more effectively and help achieve an organization's strategic objectives. It also represents a substantial evolution from methods and methodologies that have been in place for many years; OSH professionals will need to be at the forefront of leading the transition. **PSJ**

## References

- ANSI/ASSP. (2022). Safety and health metrics and performance measures (ANSI/ASSP Z16.1-2022).
- Esposito, P.A. (2021, March). Safety through accountability and recognition: OHSMS management commitment and worker participation explained. *Professional Safety*, 66(3), 39-44.
- Hallowell, M., Quashne, M., Salas, R., Jones, M., Maclean, C. & Quinn, E. (2021, April). The statistical invalidity of TRIR as a measure of safety performance. *Professional Safety*, 66(4), 28-34.
- Walaski, P. (2020, Aug.) The role of leading and lagging indicators in OSH performance measurement. *Professional Safety*, 65(8), 29-35.

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