

SAFETY RESEARCH

Peer-Reviewed

Safety Performance Measurement in ENVIRONMENTAL, SOCIAL & GOVERNANCE FRAMEWORKS

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THERE IS GROWING INTEREST in environmental, social and governance (ESG) standards, frameworks, rankings and ratings. ESG disclosures inform economic decisions by sharing organizational activities and performance related to sustainability. Investors, including individuals, brokerage firms, mutual funds and even “robo-investors” are then able to make decisions based on nonfinancial risks that are material to the company and invest in organizations that share their values. According to the U.S. Sustainable Investment Forum Foundation (2020), investors now hold more than \$17 trillion in assets selected through the application of ESG strategies. Major business decisions are now being made using ESG criteria, including investment priorities and performance assessments of Fortune 500 company executives and their organizations. Put simply, ESG cannot be ignored.

ESG is a complex ecosystem that broadly describes sustainability. The environmental criteria reflect the preservation of the natural world and can include elements such as corporate climate change policies, carbon emissions and compliance with environmental regulations. The governance criteria reflect the transparency, integrity, equity and ethics of business decisions such as accounting methods, functioning of governing boards and the selection of leadership. Most consequential to safety professionals, the social criteria reflect elements such as volunteer work, diversity and inclusion, sustainability in supply chain management, ethics, and—critically—worker occupational safety. The power of ESG with regard to safety was demonstrated in the investor-influenced removal of Suncor Energy’s CEO following a fifth worker fatality in less than 2 years (Seskus, 2022).

However, ESG is not without critics. Holistically, concerns have been raised that ESG is a distraction from business operations, that it is intrinsically too difficult to manage holistically due to the large number and interconnected nature of the disclosure criteria, that its measurement is inconsistent and flawed, and that it has no meaningful relationship to financial performance (Pérez et al., 2022). More specifically, ESG has also been charged with creating unintended consequences in corporate and

KEY TAKEAWAYS

- **Environment, social and governance (ESG) standards, frameworks and ratings recommend that organizations communicate material threats and opportunities to investors and other stakeholders. The social component of ESG disclosures frequently includes organizational values, practices and metrics related to occupational safety.**
- **ESG disclosures relating to occupational safety typically reference injury rates as a meaningful indicator of safety performance, which is antithetical to modern safety science and philosophy.**
- **Misalignment in ESG reports exists between safety values and safety metrics (i.e., what companies say they value is not what they measure). ESG standards and reporting may be improved by adding valid and reliable measures of safety that are better aligned with practices and organizational values.**
- **Adopting the proposed innovative approach to safety performance measurement in ESG disclosure standards setting and reporting offers an opportunity to modernize by transitioning toward less reliance on lagging safety indicators.**

market behavior, for example the counterproductive nature of investment in green firms over brown as revealed by Hartzmark and Shue (2022).

With the rapid advancement of ESG, safety professionals are at a crossroads of threat and opportunity. As wider critiques of ESG have noted, the metrics and measurement found therein can be problematic, and this is a major concern for occupational safety should injury frequency rates and other flawed safety metrics become further institutionalized and codified (Hallowell et al., 2021). If those who create ESG standards, frameworks, reports, and ratings unknowingly further entrench and reinforce flawed and misaligned safety measures, future improvements could become much more difficult to affect. However, if new research-backed safety metrics can be quickly mobilized, ESG is an opportunity to promote and incentivize new approaches that are statistically valid and better reflect modern safety values, principles and research. The time for changing the way we measure and report safety performance is now, and it is our responsibility as safety professionals to help bring about that change.

The aim of this article is to specifically inform how safety is currently positioned with ESG reporting processes, while also issuing a clarion call to action. The goal is not to make a general commentary on ESG as a process per se, rather to purposively narrow the focus to safety as manifested within the social ESG criteria. This article provides recommendations for the alignment of safety values, safety practices and safety metrics in ESG standards, frameworks and reports.

Background

The ESG World

ESG continues to evolve and adjust as stakeholders’ demand for nonfinancial disclosure continues to grow and corporations continue to incorporate sustainability practices into their operations. Table 1 (p. 26) provides a glossary and Figure 1 (p. 26) offers an example illustration of the overall ESG ecosystem.

Occupational safety has a prominent role in the social component of ESG because it is seen as vital for social responsibility and a sustainable workforce, and likely because safety has been measured and regulated for decades. In addition to the use of injury rates such as total recordable injury rate (TRIR), safety reporting can also include progress toward a stated quantitative or qualitative goal, summaries of safety key performance indicators or workers’ compensation insurance data. In recent years, significant progress in the understanding of safety metrics has occurred, however, the extent to which ESG reporting reflects modern safety philosophy and metrics remains a concern.

Contemporary Safety Management in Brief

Since this article is intended for safety professionals, the authors presume a basic awareness of the history of safety measurement and working knowledge of contemporary safety management practices. However, salient points with regard to safety measurement and the current activities around ESG are briefly revisited to provide relevant context for the empirical work that follows.

TABLE 1
THE SEMANTICS
OF ESG REPORTING

Term	Definition and notes	Agency support examples
ESG standards	Specific, detailed and replicable requirements for what should be reported for each topic, including metrics. Standards make frameworks actionable, ensuring comparable, consistent and reliable disclosure. Although there are many standards, most are substantially similar.	Sustainability Accounting Standards Board, Global Reporting Initiative
ESG framework	Direction on the topics that should be covered within a section or the whole ESG report and how the report should be prepared. Frameworks do not specify the methodology of data collection or reporting.	Task Force on Climate-Related Financial Disclosures, Climate Disclosure Standards Board, IR Global
ESG criteria	Make up the content of the standards. Defined aspects with associated data to be reported on using (ideally) consistent, comparable and reliable information.	U.S. Securities and Exchange Commission disclosure and reporting requirements
ESG ratings/rankings	Third-party collection, measurement and reporting of distinct ESG information, typically created by research firms based on proprietary methods.	Morgan Stanley Capital International, S&P Global Corporate Sustainability Assessment, and Dow Jones Sustainability Indexes
ESG report	Document produced by a company to disclose its specific ESG activities, data, and plans that elucidate the company's ESG position. ESG reports do not have a standard format and could be designed differently by each company. ESG reports can be viewed online for many publicly traded companies.	Reports are produced by individual companies and reflect ESG frameworks and comply with ESG standards.

Note. Adapted from "SASB Standards Overview," by Sustainability Accounting Standards Board, 2022 (www.sasb.org/standards).

Safety metrics, especially injury rates, are a critical component of ESG reporting. Although recently the foundations of safety measurement have been challenged and new methods have been proposed and evaluated, the authors hypothesized that despite such advancements most ESG reports give prominent status to injury rates.

TRIR is simply the count of OSHA-recordable injuries divided by the corresponding number of worker hours and normalized per 200,000 worker-hours. Although different geographical regions may use different scalar factors, the two variables in the injury rate tend to be the same: counts of injuries and time. In addition to TRIR, other injury rates have emerged that account for injuries of varying severity levels or classifications such as days away restricted or transferred (DART), lost-time incident rates (LTIR) and fatality rates. Unfortunately, there are serious limitations associated with using injury frequency rates such as TRIR for safety performance reporting and business decisions.

Contemporary occupational safety management has moved on from the idea that a worker-hour without an injury was a safe hour, while a worker-hour with an injury was an unsafe hour. Safety is no longer simply the absence of injuries but is instead the presence of controls or capacity (Oguz Erkal & Hallowell, 2023). Safety is the degree to which we strengthen our safety systems, processes, planning and operations—in other words, our capacity for success.

Another contemporary and complementary shift in occupational safety thinking has been a revised focus on serious injuries and fatalities (SIFs). The recent macro-level trend in incidents has seen a decrease in recordable injury rates in the past 10 years, while fatality rates have statistically plateaued (EEI, 2023). Targeting low-severity incidents does not necessarily help a company prevent SIFs; simply counting near misses (or worse, setting targets for their reporting; see Oswald et al., 2018) will not prevent a fatality in the future. Work by Hallowell et al. (2021) demonstrates that TRIR does not have a statistical association with fatality rates, even over long reporting periods. SIFs must be managed differently and must be the priority because they are almost always infinitely more impactful than low-severity injuries.

Statistically, TRIR raises other more serious issues. The nature of the metric means it weighs all recordable injuries equally despite massive differences in severity

FIGURE 1
COMMON ESG DISCLOSURE CATEGORIES

Environmental				Social				Governance	
Climate change	Natural resources	Pollution and waste	Environmental opportunities	Human capital	Product liability	Stakeholder opposition	Social opportunities	Corporate governance	Corporate behavior
Carbon emissions	Water scarcity	Waste	Energy efficiency	Labor management	Product safety	Controversial sourcing	Access to communication	Board	Business ethics
Product carbon footprint	Biodiversity and land use	Packaging material and waste	Green building	Health, safety and environment	Quality	Community relations	Access to finance	Executive compensation	Tax transparency
Climate change vulnerability	Raw material sourcing	Air quality	Renewable energy	Human capital development	Ethical sourcing	Indigenous partnership	Access to talent	Cybersecurity	Risk management
		Noise and vibration		Health and wellness	Sustainable materials	Archeological	Inclusion, equity and diversity	Supply chain	Reporting and disclosure

(e.g., a two-stitch cut to the finger is treated the same as a fatality because both are one recordable injury). This does not align with a focus on SIFs above all other incidents. Even more critical is the fundamental fact that TRIR is statistically invalid over most time frames when business decisions are made. Hallowell et al. (2021) demonstrates that TRIR and other injury rates are not statistically valid because of the rarity and randomness of recordable injuries. They found that hundreds of millions of worker-hours of exposure are needed before a TRIR carries enough statistical validity to report to one decimal place of precision, rendering TRIR invalid for nearly every practical comparison or business decision, including those around ESG. Furthermore, the study showed that TRIR is not indicative of future recordable injury rates or fatalities. TRIR has some strengths, notably that rates are based on injury types (e.g., recordable, lost time, fatality) that are objective, easy to communicate to all stakeholders and, most importantly, are used consistently across industries. These aspects ensure that the metric has a common meaning that spans organizational boundaries, making direct comparisons simple and straightforward. This helps explain why injury rates and TRIR have been the dominant safety performance metrics for nearly 50 years despite their severe limitations, and through ESG there is the potential for this misplaced and flawed reverence to continue.

Safety Metrics in ESG Standards

ESG standards provide guidance on what should be reported. Most conventional ESG standards such as the Global Reporting Initiative and Sustainability Accounting Standards Board standards include recommendations related to safety reporting. Although they offer some contextual information related to modern safety systems, the most common metrics recommended are fatality rates and TRIR. In fact, TRIR and fatality rates (neither of which are statistically valid indicators of safety performance) are the only two ubiquitous metrics across all three frameworks as shown in Table 2. Although other metrics are suggested, the majority are variations of injury frequency rates and other lagging indicators. Notable exceptions include leading indicators, hierarchy of controls, training and safety culture. Unfortunately, there is little guidance on how to measure and report these variables consistently, so they are comparable. Table 2 provides an overview of the metrics and concepts recommended by the three most pervasive standards in their 2022 iterations.

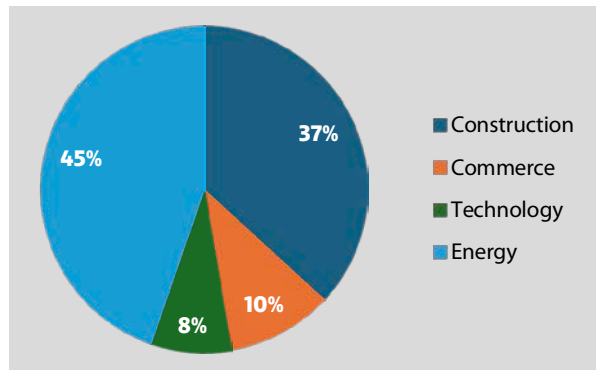
Research Method

To better understand the current state of safety reporting in ESG, the authors analyzed a sample of ESG

TABLE 2
SAFETY METRICS WITH ESG STANDARDS

Standard requirement	Global Reporting Initiative	Sustainability Accounting Standards Board	International Electrotechnical Commission
Fatalities/fatality rate	x	x	x
High-consequence work injury rate	x		
Recordable injury rate (total recordable injury rate)	x	x	x
Types of injury	x		
Number of hours worked	x		
Leading indicators	x		
Hierarchy of controls	x		
Compliance items	x		
Near-miss	x	x	
Emergency response training		x	
Total vehicle incident rate		x	
Culture of safety		x	
Days away restricted or transferred			x
Lost time incident rate			x

FIGURE 2
COMPOSITION BY INDUSTRY



reports produced in 2021. Forty ESG reports were selected from members of the Construction Safety Research Alliance and Fortune 500 companies. This was a purposive sample of convenience, profiled to ensure balanced representation of large construction, technology and energy companies. The final sample profile with regard to company sector is shown in Figure 2. The nature of this sample therefore dictates that the findings in this article should not be automatically extended to other populations.

Each report was content analyzed to capture concepts related to the organization's safety values, practices and metrics. In this analysis, values were defined related to what organizations say is important, which is reflected in stated goals, priorities and principles. Through an inductive process, the content analysis identified patterns of common keywords within the reports under each of the three concepts: values, practices and metrics. These keywords therefore became the safety in ESG lexicon as manifested in the sample of reports, verified through a constant comparison process (Silverman, 2019). Keywords related to organizational values included elements

such as “culture,” “proactive,” “zero target,” “SIF priority,” “compliance,” “human/organizational performance” and “learning.” Practices relate to what an organization says it does to keep workers safe. Safety practice keywords included elements such as “external partnerships,” “monitoring” and “learning teams.” Finally, safety metrics include factors related to how safety performance is quantified and reported. Keywords for safety metrics included “(safety) climate,” “leading indicators,” “precursors,” “TRIR,” “DART/LTIR,” “first aid rates” and “fatality rates.” In summary, the authors investigated the relationships and trends related to what companies say they care about regarding safety, what they do to promote safety, and how they measure and report safety performance.

Using the results of the content analysis, a network analysis was performed to visualize the frequency with which concepts and keywords appear together in ESG reports. A collective network was built and analyzed through topic analysis using ORA software to generate visualizations and reports (Carley, 2015). ORA is a network analysis tool that helps users build custom network models through advanced graph theory. In this study, a “company x keyword” network folded by keyword was created to model commonly occurring concepts and how they were used together. Simply, if two concepts appeared in a company’s report together, an edge was formed. The more the same concept appeared in multiple reports, the larger the node size that results. The results were used to evaluate the common values, practices and metrics, and how they were reported with respect to each other in ESG reports.

Findings & Discussion

Content Analysis

Table 3 shows the percentage of ESG reports containing each of the keywords. There were three major organizational values observed. Companies broadly desire to have a strong safety culture, meet or exceed regulatory compliance, and be proactive in their approaches to safety management. The strongest theme among them was a strong and positive safety culture. This is interesting as

safety culture is one of the most intangible and debated aspects of professional safety management, still lacking an agreed definition or approach to its measurement. This was followed by compliance, a perhaps inevitable inclusion to reassure investors of the law-abiding nature of the organization. Proactivity was the third most common factor mentioned, where organizations hope to be forward looking, predictive and beyond compliance.

All companies reported at least one safety management practice. These were both diverse and highly inconsistent, making further analysis within this category impractical beyond the generation of a long list of familiar safety tactics and interventions. Reported practices ranged from safety management system development to various bespoke learning and risk assessment processes. Additionally, 60% of companies reported some type of collaboration with a nongovernmental organization, nonprofit or academic institution related to safety. However, there was a lack of reported monitoring of such activities, and thus a lack of demonstrable evidence of their success or failure. Although companies aspire to have a proactive safety culture that exceeds minimum compliance with safety regulations, this is accompanied by seemingly disjointed safety management activities lacking in monitoring and control.

In terms of safety metrics, almost all the companies reported a lagging indicator in the form of a recordable incident, fatality rate or other injury rate. This was perhaps to be expected considering that traditional safety metrics are ubiquitous despite issues with validity. Some alternative metrics were also reported such as number of people kept safe, total number of hours without incident and a percentage of physically safe work. Only three companies reported some kind of leading indicator data such as leadership engagements, an automated external defibrillator program and training. Although some organizations claimed to collect leading indicator data, they did not report numbers.

Networks

Three networks were built to show the extent to which values, practices and metrics are aligned. The

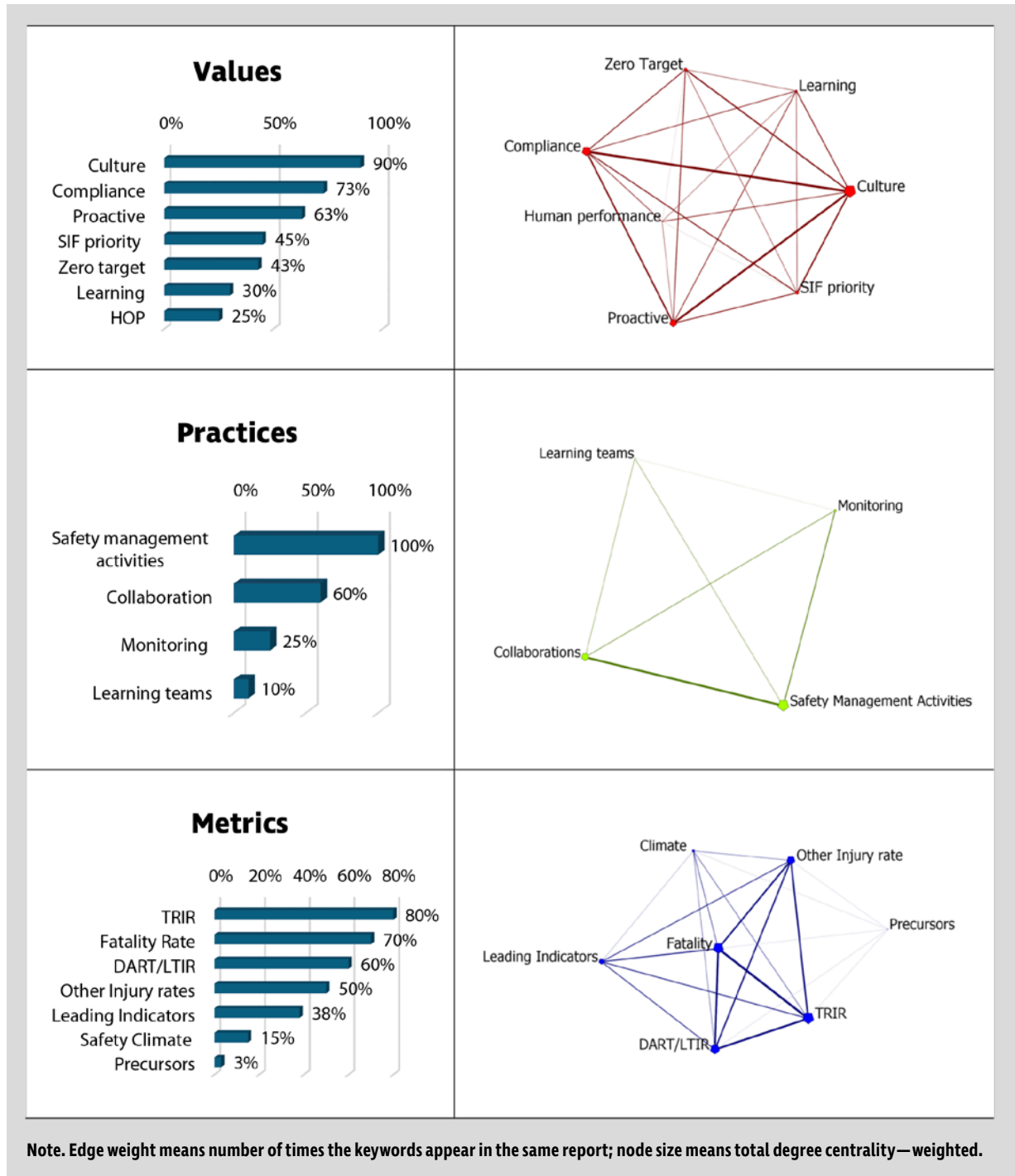
TABLE 3
PERCENTAGE OF ESG REPORTS CONTAINING NOTED KEYWORDS

Values						
Culture	Compliance	Proactive	SIF priority	Zero Target	Learning	Human/organizational performance
90%	73%	63%	45%	43%	30%	25%
Practices						
Safety management activities	Collaboration	Monitoring	Learning teams			
100%	60%	25%	10%			
Metrics						
TRIR	Fatality rate	DART/LTIR	Other injury rates	Leading indicators	Safety climate	Precursors
80%	70%	60%	50%	38%	15%	3%

networks were constructed by forming a link between two keywords that exist together within the same report. The links between nodes were weighted depending on how often the keywords appear together, while the nodes were sized depending on the frequency their appear in the reports. The resultant networks can be found in Table 4.

Analyzing the networks revealed that most of the values appeared together frequently. However, unlike the other concepts, “human performance” and “zero targets” never appeared together in the same report. This is a promising finding considering zero targets are in fact detrimental to human performance, setting an unrealistic goal for frontline supervisors

TABLE 4
KEYWORD PERCENTAGES & NETWORKS



(Sherratt, 2014). Although most companies report some kind of safety activity, “learning teams” and “monitoring” rarely appeared in the ESG reports.

With regard to safety metrics, strong connections can be seen between lagging indicators such as fatality rates, total recordable rates and DART. Safety climate and human factor precursors that relate to SIF are the least common metrics mobilized in ESG reporting. This shows that ESG metrics lean heavily toward objective or regulatory metrics, but do not have a strong grasp of more subjective

measures of safety such as precursors or safety climate. This is logical, considering such metrics are harder to collect, understand and defend, but their value is nonetheless impactful. It could reasonably be expected that such subjective metrics would play a much more prominent role in ESG reporting given the concurrent prioritization of safety culture above all else.

As a result of this analysis, the authors identified the most common safety values, practices and metrics reported by the companies in their ESG reports in this sample.

TABLE 5
TRADITIONAL & ALTERNATIVE SAFETY PERFORMANCE ASSESSMENT METHODS

See Oguz Erkal et al. (2023) for detailed explanations and formal multidimensional assessment of each evaluation method.

Alternative metric	Colloquial definition	Strengths	Weaknesses
Lagging: Injury rates (e.g., total recordable injury rate)	Counts of injuries over time (normalized)	<ul style="list-style-type: none"> Based on consistent definitions (e.g., OSHA recordable) Based on empirical data Generally based on higher-severity injuries (i.e., at least the threshold of “recordable”) 	<ul style="list-style-type: none"> Not statistically valid for most practical purposes Retrospective in nature Not predictive of future incidents Injuries are numerically similar despite severity Misaligned with modern safety philosophies because it measures safety as the absence of injuries
Lagging: Severity-based lagging indicator	Injury rate where injuries of multiple severity levels are weighted based on the magnitude of energy involved	<ul style="list-style-type: none"> Based on consistent definitions of “recordable” Based on empirical data Inclusion of more injury types in one metric adds statistical stability Higher weighting of more severe injuries better reflects company priorities 	<ul style="list-style-type: none"> Retrospective in nature Predictive capacity has not been studied Misaligned with modern safety philosophies because it measures safety as the absence of injuries
Leading: Safety leading indicators	Quality and quantity of the safety activities performed to prevent injuries	<ul style="list-style-type: none"> Measures input to the system May be collected in sufficient volume to be statistically valid Predictive of future outcomes and proactive in nature 	<ul style="list-style-type: none"> Leading indicators are not standardized making them unclear and not comparable Programs are expensive
Monitoring: Safety climate	Employee perceptions of the strengths and weaknesses of key dimensions the safety system solicited through surveys	<ul style="list-style-type: none"> Indicates safety culture and employee satisfaction with safety May be collected in sufficient volume to be statistically valid Enables proactive decisions before injuries occur Predictive of future outcomes and proactive in nature 	<ul style="list-style-type: none"> Unclear because different companies measure climate with different definitions and instruments Does not reflect objective reality (based on perceptions)
Monitoring: Precursor analysis scores	Assessment of the human factors that contribute to SIF probability based on field engagements	<ul style="list-style-type: none"> Directly indicative of SIF conditions May be collected in sufficient volume to be statistically valid Predictive of future outcomes and proactive in nature 	<ul style="list-style-type: none"> Based on the perception of an observer and the openness of the employee Expensive to integrate Challenging to understand and communicate
Monitoring: High-energy control assessments	Proportion of life-threatening (high-energy) hazards with direct controls as observed during site visits	<ul style="list-style-type: none"> Reflects the philosophy that safety is the presence of safeguards Directly indicative of SIF conditions May be collected in sufficient volume to be statistically valid Based on empirical observations and mathematical assessments Proactive in nature because it reveals actionable trends in hazards and controls 	<ul style="list-style-type: none"> Expensive to integrate into the safety system Requires consistent application of definitions Predictive relationship between high-energy control assessments and injury rates has not been studied

TABLE 6
EXAMPLES OF POSSIBLE
METHODS OF ALIGNMENT

The analysis yielded that companies mostly aspire to have a proactive safety culture that is in compliance with safety regulations. To achieve this target, each company undertakes different safety programs and practices and collaborates within their industry to learn from each other. They mostly report lagging metrics such as TRIR and fatality rate. Considering these findings, two strong and problematic conclusions from the review and analysis of ESG reports are detailed:

1) Misalignment exists between what companies report as their values and their safety performance metrics. Put simply, companies say they care about X, implement Y and measure Z. This misalignment is problematic because it makes it difficult for meaningful external inspection from investors, partners and other stakeholders. It is a well-established business principle that alignment among business goals, practices and metrics is vital to ensuring that an organization is working toward its objectives in a cohesive and efficient manner.

2) Inconsistency exists in the safety practices implemented across companies, which makes comparisons of safety practices untenable. No two companies reported similar safety management practices showing major variability and inconsistency between how companies reported their various safety activities and programs. This makes safety management system comparisons across companies virtually impossible, suggesting that monitoring and measuring safety practices may not be viable through ESG reports without some form of standardization.

Proposing Alternative Safety Metrics in ESG

A principle of effective business is alignment between values, practices and metrics. In the analysis of ESG reports, the authors found reasonable alignment between safety values and practices. For example, companies reporting a desire for a strong safety culture often reported leadership engagements and other safety activities that could reasonably connect to this loose idea of culture. However, metrics were largely misaligned and antiquated. For example, companies reported safety culture as a value but had no corresponding measure. Instead, they illogically pair a desire for safety culture with injury rates. The one notable alignment was between SIF reduction as a focus and reporting of fatalities; however, it should be noted that neither the count of fatalities nor fatality rates are statistically meaningful over annual reporting periods.

Given the evidence that injury rates such as TRIR are statistically invalid for virtually all business decisions (Hallowell et al., 2021), their prevalence in ESG safety reporting is worrisome. If this trajectory is sustained, organizations bear the risk of reporting ineffective, inconsistent and unactionable metrics that have the potential to mislead stakeholders. More critically for the safety profession, inclusion of flawed metrics in ESG may further crystallize this practice and thwart future efforts toward progress and innovation.

Value	Practices	Metrics
Culture	Implement safety practices that may improve culture such as learning teams, leadership engagements, and efforts toward diversity, equity and inclusion.	Monitor trends in safety climate scores and human factor precursors, and link observations to long-term outcomes.
Proactive	Implement practice safety strategies such as prejob planning, risk assessments and safety observations.	Track the quality and frequency of key practices and correlate to long-term trends in safety outcomes.
SIF	Focus on SIF hazards and controls in worksite design, prejob briefs, safety observations, leadership engagements and learning teams.	Monitor high-energy control assessments and correlate to long-term trends in safety outcomes.

Valid metrics are needed that better reflect organizational goals, priorities and practices. Such alignment would transform ESG reporting from being a threat to safety performance to being an opportunity to accelerate and institutionalize innovation. ESG standards offer a unique opportunity to better educate companies on the principles of modern safety by including them in their guidance and reporting on them as part of company ESG disclosures. Reflecting a desire to transition from reactive to proactive, ESG standards and frameworks should be revised to include research-validated leading indicators and monitoring variables.

As reported in Oguz Erkal et al. (2023), viable alternatives now exist that have been described, validated and tested by industry leaders. These include the severity-based lagging indicator, leading indicators, safety climate, precursor analysis scores and high-energy control assessments. These alternatives include established metrics (e.g., leading indicators, safety climate) and novel metrics that are still nascent in practice (e.g., severity-based lagging indicators, high-energy control assessments). These alternative metrics are briefly reviewed in Table 5, with the reported strengths and weaknesses. For a complete comparison, TRIR is also reviewed in this table.

When considered holistically, Table 5 reflects that all metrics (including TRIR) have both strengths and weakness and no single metric is strong in all areas. This indicates that for more effective and accurate ESG reporting, a suite or combination of metrics would be most appropriate to more meaningfully measure and report on the practices and values of firms within their safety operations. While the ideal balanced scorecard approach has not yet been established, now is the time to redesign safety performance measurement, responding and leveraging the momentum of ESG itself.

The ideal ESG report would contain carefully selected goals that reflect an organization's values, specific practices intended to advance those goals, and metrics that indicate the extent to which the organization is progressing toward those goals. For example, if a company wishes to achieve excellence in being proactive, it may consider optimizing leadership engagements, safety observations and safety planning activities. It could also gauge progress toward the goal by measuring leading indicators such

as the quality and frequency of leadership engagements, safety observations and prejob briefs. Table 6 (p. 31) provides examples of possible alignment between values, practices and metrics.

Conclusions

Some key contemporary methods of measuring and communicating safety performance within ESG disclosures are antiquated and misaligned with modern safety science and philosophy. This analysis of the ESG reports of large to mid-sized companies including Fortune 500 organizations found considerable misalignment between reported values and measured metrics. Although organizations value culture, proactive safety, compliance and SIFs, the reported safety metrics are almost always lagging indicators and now-invalidated metrics such as TRIR. This trend is likely not unique to ESG and may be reflection of the overall state of occupational safety management.

If the status quo continues, stakeholders are bound to suffer from the insufficiently managed safety system and misdirected safety investments attempting to improve random metrics. Alternative metrics are available, and a methodology of their use offers an advancement in safety performance measurement for ESG. Safety professionals should ensure that they are familiar with these new practices and aware of how to optimally undertake such evaluations to better contribute to ESG discussions. If we act now, improvement of the measurement of safety within ESG could also accelerate the adoption of scientifically valid methods of communicating safety performance, instead of further entrenching those already and scientifically proven problematic. **PSJ**

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