

SAFETY PERFORMANCE INDICATORS – A GSI PERSPECTIVE

Current

In measuring and recording safety performance organisations have traditionally relied on 'lag' (historical) indicators relating to accident and injury rates, e.g. Lost Time Injury Frequency Rate (LTIFR) and Total Recordable Injury Frequency Rate (TRIFR). These lag indicators are a measure of injuries to individuals within a given period and converted to a frequency to normalize the data.

'Measure the extent of harm that has occurred – past performance. Reactive, tells you whether you have achieved a desired result (or when a desired safety result has failed) and provide historical information about health and safety performance'. (OECD 2008).

There are undoubted benefits to employing these lag indicators, including:

- easily able to identify trends, i.e. are we injuring more, the same, or less than we were last year
- being able to benchmark, either internally, or externally with other organisations, i.e. are we worse, the same, or better than the industry average
- the concept of 'injury' is easy to grasp and relationship to safety intuitive
- using the data to help people understand the concept and importance of safety

However though still widely used and reported, the limitations of these metrics are many fold including the following:

- they are a record of what has happened (not might happen)
- they are a low predictor of what might happen in the future
- they are subject to random fluctuations and therefore not reliable
- they are a measure of 'failure' not 'success'
- they are often a record of injuries as a result of decisions made in the past
- remedial actions taken as a result of these indicators cannot be measured for efficacy until some (unspecified) time in the future
- they preclude occupational diseases and/or conditions, e.g. mental health impacts
- they are predominantly a record of high frequency and low consequence incidents and therefore not a strong predictor of low frequency-high consequence events

- the grouping together of widely differing impacts as measured by the severity and long lasting an injury (and therefore the cost to the individual, business and wider community as a result of the injury)
- they are a measure of 'time off work' but this in itself does not have a strong correlation to the severity of the injury
- variability in reporting based on definition, culture or perceived benefit/loss in reporting, e.g. active suppression of reporting injuries if it negatively impacts on financial incentives
- the concept of a 'injury frequency' would not be commonly understood within an organisation so significant uncertainty among the workforce and other stakeholders as to what the figures actually mean
- the closer the measure gets to '0' the harder it is to use them to motivate behaviour to higher safety performance
- increasingly more difficult to discern performance due to 'luck' or 'design'

These deficiencies and weaknesses are well known, at least by safety professionals, however the primacy of lag indicators as the key measure of safety performance seems to doggedly remain (though signs are hopeful that a more enlightened and expansive viewpoint especially at the governance level of the organisation is occurring).

In more recent times increased emphasis has been given to 'lead' indicators, namely those indicators that seek to measure outcomes that are perceived to be a predictor of potential incident or injury, i.e. they play an advance warning role.

"Proactive, preventative, and predictive measures that monitor and provide current information about the effective performance, activities, and processes of an EHS management system that can drive the identification and elimination or control of risks in the workplace that can cause incidents and injuries."

Campbell Institute, National Safety Council

Being proactive not reactive. A common example is the measure that records the number of 'near misses', i.e. something has occurred that could have led to an incident and/or injury but in this instance did not. The underlying principle is that if we can understand the frequency and nature of these near misses we can learn from them and implement remedial action to reduce incidents and minimise both the potential for injury and or the injury occurring at all.

This concept has been popularized by Hendrich's Law and the derivative Bird Triangle. Both of these in essence portray a relationship between the number of near misses and subsequent injuries, and the severity of those injuries. However as intuitively valuable as this principle implies in helping to reduce injuries by managing and learning from near misses, the major criticism of this thinking is three-fold:

1. The magnitude of the relationship between near miss incident and level of subsequent injury is not consistent and therefore cannot be universally applied.
2. That an emphasis on reporting near misses can tend to enforce a belief that by managing high frequency but low consequence events is all that needs to be substantially done to improve injury rates (lag indicators)
3. That the vast majority of what is reported as a near miss measure are not the variables that are shown to be the causal factors for low frequency-high impact events (as defined by significant impact measured by fatalities, number and extent of injuries, environmental damage, reputational damage, and high remedial financial cost)

In order to account for the 'limitations' of the near miss as a lead indicator many organisations have sought to broaden their portfolio of lead indicators to include measures such as 'safety conversations/interactions' or number of employees being trained and the type of training provided relevant to performing their roles more safely. Of course regulatory requirements determine some of these supporting factors but nonetheless many organisations believe there is a strong link to these 'preventative' and 'pre-emptive' actions in improving the safety performance of the business.

It is in this mindset that more and more organisations are seeing the value in seeking to measure safety culture and safety leadership capability as key lead indicators of an organisations future safety performance (as evidenced by GSI Membership).

However it is not just one safety performance measure or category of measure required but a combination that is going to be most useful in understanding an organisations current and future safety performance. Today it would be surprising not to find in most organisations a mix of lag and lead indicators being used as a 'portfolio' of safety performance measures.

Future

Equally there seems to be an appetite to learn more about not only the efficacy of existing indicators, lead or lag, but whether there are others that should be employed, as well as what mix or balance of indicators, existing and new, will provide the most optimal 'portfolio' that will help businesses to continue to improve their safety performance (freedom from risk).

Recent local research by Dr Sharron O'Neill of Macquarie University, sponsored by the Safety Institute of Australia and CPA Australia, has been examining this topic of safety performance measurement. As well as generally supporting the aforementioned pros and cons of the existing lead and lag indicators here are some of the key conclusions to date:

- A need to move away from ‘value laden’ terminology such as the difference between a ‘minor’ or ‘major’ injury, to an objective driven lexicon of safety performance language that everyone can use and interpret in a consistent manner
- That the consequences of non-fatal disability (full or partial) far exceeds the consequences and cost of all absences (short or long)
- There is an inbuilt danger in focusing on highly aggregated LTI or TRI rates (they are by their nature non-discerning), e.g. an organisation could show a declining LTI but at the same time have a increasing level of permanently disabling injuries
- LTI’s are at best a measure of how well a company is managing minor hazards (Hopkins 2000)
- Lost work days arguably more valid indicator of lost productivity than LTI’s
- LTI is not a valid measure of the consequences (the extent of the ‘damage’) from an injury
- Safety should be defined as a ‘freedom from risk of injury’ (the corollary being that injury rates do not measure risk or evaluate risk drivers)
- The absence of injury is not the same as the absence of uncontrolled risk
- Need to measure the severity of injury and illnesses with relation to human, organisational and financial cost (the corollary being that we should shift focus from frequency to impact)

The conclusion from above is to invert the traditional safety triangle and apply a 3 level severity measure:

1. Class 1 – Life Altering
 - 1A – Fatality
 - 1B – Total Permanent Impairment
 - 1C – Partial Permanent Impairment / (some) Long Term temporary impairment (greater than 6 months)
2. Class 2 – Temporarily Life Altering
Including (some) long term temporary impairment, moderate temporary impairment, and (some) short term temporary impairment
3. Class 3 – Not Life Altering
Including (some) short term temporary impairment and medical/first aid, no impairment

This is not to ‘throw out the baby with the bath water’ but to ensure the right balance is achieved in the resources allocated to preventing life altering

incidents (Class 1) as well as non-permanent life altering incidents (Class 2 and 3).

Additionally organisations have not, for various reason, effectively recorded and reported occupational illness and disease, e.g. mesothelioma, mental health related issues.

The general conclusion to all of the above is to move to something that is beyond the current injury measures. O'Neill has termed this alternate perspective of indicators as 'Positive Performance Indicators' (PPIs), which is likely to be a mix of both lead and lag indicators. These PPIs should '...detect and provide advance warning of latent safety hazards...Their value lies in the avoidance of safety failures and the associated injuries, illnesses and direct and indirect failure costs'. (p19)

Below are some key PPI principles articulated by O'Neill and others:

- PPIs need to be tailored to each organisation's specific needs including identified high priority risks. This has obvious relevance to whether PPIs can be benchmarked across organisations/industries if there is no/minimal standardisation.
- PPIs should match an organisation's cultural maturity (including management/leadership maturity). This suggests that as the maturity change so should the PPIs employed and/or how they are employed. The corollary is that in less culturally mature organisations it would be more difficult to obtain employee engagement with certain types of PPI. This maturity filter should be site/business unit specific and not just an aggregated assessment.
- PPIs should be identified from a rigorous causal mapping process (suggesting that the Bow Tie Analysis would have utility here).
- PPIs should be a mixture of lead and lag indicators to ensure a more complete assessment.
- PPIs constructed so that they are seen as sufficiently relevant to safety, clearly understandable to all relevant stakeholders and, repeatable (and therefore able to be compared over time and between different organisations, suggesting a degree of consistency is not only preferable but possible).
- PPI's should by their very nature promote decisions and actions to continuously improve safety performance
- Lead indicators specifically seen as 'trends' and as such more relevant to think of them as 'indices' (as opposed to 'indicators')
- The PPIs selected (or combination of PPIs to form an unique 'PPI Set') to be fully communicated and part of intensive education program

It is pertinent to add to the above discussion the recent internal discussion between GSI and various partners around 'Process Safety' (as distinct from personal safety) and its application to all organisations and not just high risk industries it is typically restricted to. This has been driven by a more specific focus on 'Critical Leadership Controls' that seems to be an obvious missing piece for all businesses in being able to minimise /prevent the incidence and impact of unwanted events.

Lead Indicators and Causal Relationships

In examining the issue of 'causal relationships' between lead indicators it is evident that a paradox exists. By its very nature a lead indicator is designed to prevent and/or minimise an unwanted OHS event from occurring. The further 'downstream' the indicator is from the potential event the greater the potential impact of that action to positively influence the event. However and somewhat perversely the further downstream the indicator the more problematic it becomes in showing/proving a causal relationship to the unwanted event. Figure 3 – Appendix illustrates this relationship.

For some this inability to 'prove' a causal relationship is sufficient to discredit the utility of such indicators. To ignore potentially highly valuable indicators under such a test would be a pity and wrong. This is not the same as the blind application of an indicator but using a set of creditable criteria to initially select and apply an indicator and then to measure impact (lag indicators) over time will provide far more value to the organisation than a blanket rejection of 'so called un-scientific' indicators.

Conclusion and Relevance to GSI

It would seem there remains ample opportunity for GSI to take a lead in identifying meaningful PPIs (using O'Neill's language), making these available to organisations through the online tool, and then ultimately to use data generated by member use to seek to validate these measures.

The current creation of the 'Gen 2' GSI tool specification and consequent prototype provides the impetus to incorporate not only PPIs, being a mix of lead and lag indicators, within the new tool, but by extension, take a leadership role in a (significant) shift in how organisations measure safety performance.

The most obvious challenge is to ensure the GSI tool is sufficiently flexible to allow businesses options in respect of PPI's to be used (taking into account the principle, if agreed, that PPI's need to be organisation specific). Additional challenges/questions arise:



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- Can/should we create a 'portfolio' of PPIs that organisations can select to create their own unique portfolio?
- Should some of the PPI's allow for a degree of customisation by the organisation?
- Can the tool provide a fully customisable functionality that will allow a member to create an entirely new PPI?
- What level of standardisation is possible, not to mention desirable, to allow benchmarking (a key GSI value proposition)?
- Can a number of measures (or category of measures) be combined and with an applied weighting create an overall 'GSI' score?

In addition a PPI System needs to show (allow) links to and incorporate where possible the following:

- Organisation's key business & OHS objectives
- Risk Management Process – identified risks, hierarchy of controls, control effectiveness
- Critical Leadership Controls
- Resilience model/s