

SAFETY PERFORMANCE INDICATORS

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CASE STUDY

Downer Blasting Services is a subsidiary of a large tier one company. Five years of activity were analysed during the study commencing in October 2008 and finishing in October in 2013. The period of the study is directly related to Downer Blasting Services achieving 5 years Lost Time Injury Free on the 11th of October 2013.

On the 11th of October 2008 an accident occurred which resulted in a Lost Time Injury. The injured employee required a knee reconstruction operation and a lengthy rehabilitation period before returning to pre-injury duties.

No one appreciated the significance of the accident at the time or the step change that followed.

Post accident and investigation the company's senior management team held a strategic planning session to determine the future direction of the company. During this meeting the two questions were asked

1. Is it acceptable for a company to forecast key performance indicators with acceptable numbers of lost time injuries?
2. Is it acceptable to financially reward company personnel for achieving targets that condone workplace injuries?

The answer to both these questions was "NO" but the challenge of how to achieve a company goal of "Zero Harm" and remain an effective profitable company was the dilemma.

Amongst cries of "we meet or exceed industry standard" or "we'll price ourselves out of the market" the voice of reason sounded. The Executive General Manager following the thinking of Alfred Noble moving his family into the family's dynamite factory, challenged each member of the management team with one simple question. Would you allow your family members to work for our company? The silence that followed was the unanimous response that commenced the journey.

This decision returned the management team back to the original challenge, how to develop a company that anyone would be proud to have their family members work but remain competitive.

The safety metrics available were heavily weighted towards lagging Indicators and auditing the company against the safety management system. Lofty targets were applied but the results were consistently well short of the target and the reasons for not achieving the target were always justifiable.

The senior management team agreed the primary purpose of measuring health and safety performance is to provide information on the progress and status of strategies, processes and activities undertaken by the business to manage risks to employees, contractors and the

public. Therefore if the current metrics were not being achieved, what would they measure and how would they measure it?

Momentum was being generated to place a greater emphasis on leading indicators rather than lagging indicators to measure the effectiveness of safety within the business. Although a systematic review of the controls and metrics was required to determine the most suitable and effective controls and metrics.

The review of the Lagging indicators as predicted unfortunately reflected personal injuries, equipment damage and/or environmental harm. Historically incidents occurred; we investigated, we identified the root cause and developed new controls (eg procedures) and amended the safety management system to prevent reoccurrences.

The review also identified incidents involve people, and people were one of the primary contributing causal factors in the incidents reviewed. The list below summarise the more frequent contributing factors in the incident data reviewed.

- Inadequate hazard identification or hazard controls
- Inadequate supervision
- Inadequate work procedures
- Improper decision making
- Unintentional violation
- Inadequate training/competencies

Unfortunately our safety management systems were evolving quicker than the workforce's ability to comply with the complexity we believed guaranteed safety.

Reactions to incidents within our company were no different to successful Tier One business throughout the world. Overreacting and generating safety management systems containing thousands of policies, standards, procedures, forms etc is consistent.

The complexity of our safety management system was the result engineers designing controls without regard for the end user: "their client". The same engineers also designed elaborate audits to measure the level of compliance.

The concept of using Leading Indicators as the primary method of improving safety and potentially preventing incidents or minimising the consequences was challenging. Purists within the company argued quantitative metrics are black and white when compared to qualitative metrics. The purists were eventually convinced specifically designed Leading Indicators are part of the process to improve future safety performance.

Positive performance measures can evaluate the safety culture of a business by assessing behaviours, leadership and communication. Leading indicators when specifically developed for a business are:

- essential to planning
- an accurate measurement tool
- critical for continuous improvement

The accuracy of Leading Indicators was critical, because if completed incorrectly can create misleading results and jeopardise the effectiveness of the Safety Management System.

The style of Leading Indicator will vary but the development can commence with several tried and tested tasks:

- Job Safety Assessment (JSA)
- Training
- Safety meetings
- Audits
- Inspections
- Behavioural and Task Observations

To be effective Leading indicators should be:

1. Measurable: *objective and easy, information should not be difficult to collect*
2. Meaningful: *related to activities that are considered important*
3. Not susceptible to manipulation: *performance must be measured against a clearly defined target to eliminate variable results*
4. Availability of data: *easily accessible and interpreted*
5. Ability to integrate: *the activities must not be perceived as a burden or extra task but rather interwoven into the fabric of normal activities*

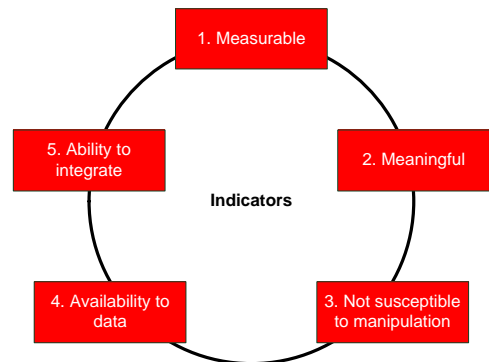
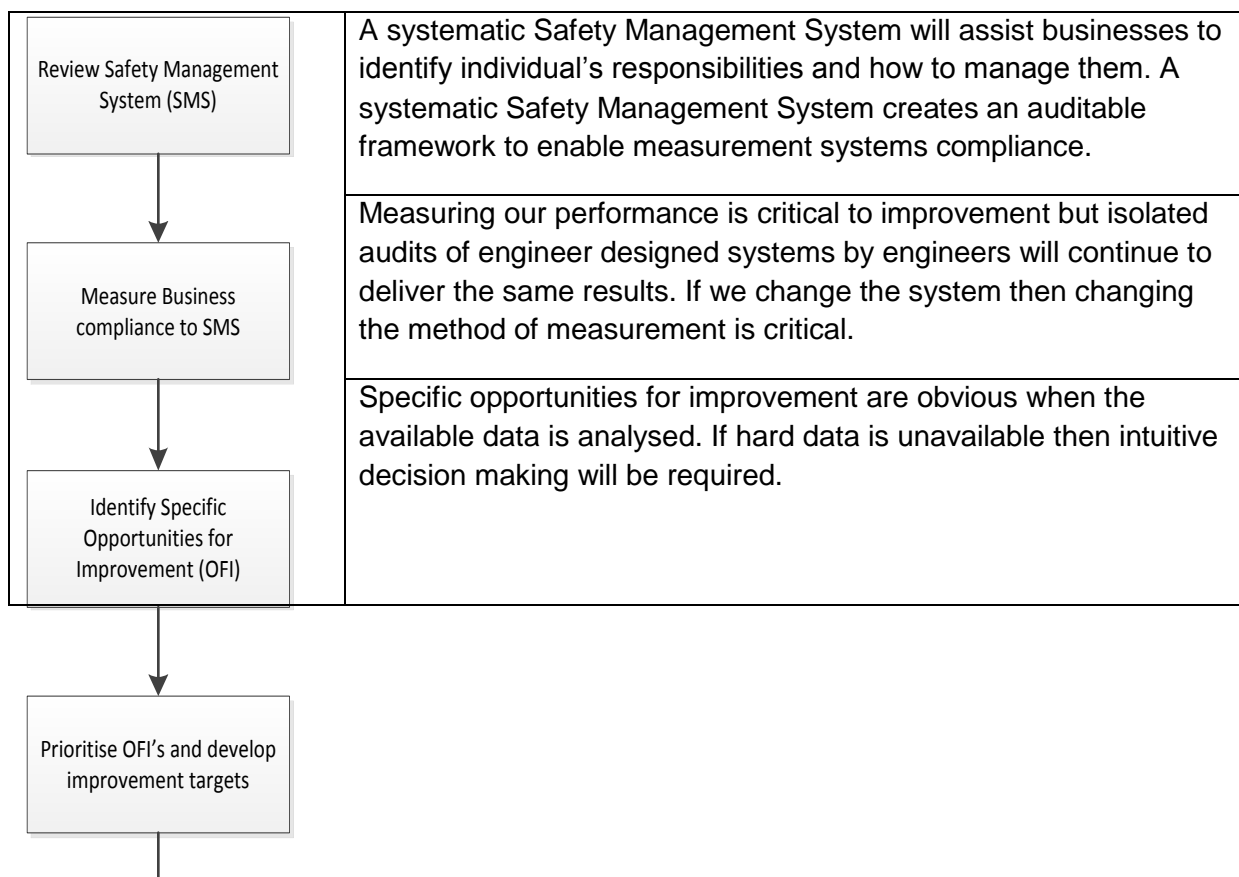


Figure 1

The process utilised to identify the appropriate Leading Indicators is demonstrated in the six step model below.



	The measurement of controls has associated costs and must be undertaken efficiently and effectively. Always remember just because it can be measured doesn't mean it should be.
	The methods of measurement or the controls must be simple to implement so as not to require capital investment or manning intensive. The activities must not be complex and time consuming for an administrator to collate.
	The monitoring frequency is initially based on the frequency of the historical incidents and the manning resources available to the business. If resources are limited then focus on the high impact incident controls.

With the decision to focus on Leading Indicators to improve safety was agreed and committed too and the establishment of a framework to facilitate the process commenced. The framework enabled the identification of the primary incident causal factors and safety management system failings. The task of developing effective meaningful tasks to improve safety and ensure sustainability commenced.

The project team came to the realisation the success of the project was dependant on the Safety Management Systems being designed for:

- The end user,
- Aligning practical application,
- Ease of use and
- Blending safety into the fabric of the task is the first critical step.

The project team then asked themselves four questions:

1. Do we know what can kill us or seriously injure us?
2. Do we know how to prevent this?
3. Is this practical?
4. Can we sustain this?

The review process identified several opportunities to improve the level of safety within the business but the challenge was to control the pace to ensure the changes to the culture were sustainable.

Year 1

Eventually three positive performance tasks were selected to ensure adequate resources were available to support the step change.

The initial Leading Indicator tasks were

- **Reporting of events** with impunity to develop a culture of reporting and not a culture of hiding events.

An open honest reporting culture without fear of reprisals whether real or not was critical and also a mechanism of easily accessible reporting was essential. A new electronic reporting system was developed with email distribution and one person responsible to enter the notifications into the database. Initially the business was directed to report any and all events to develop a positive reporting reflex.

- **Completion of remedial/corrective actions** within the scheduled timelines to develop a culture of positive response to reporting and participation in improvement planning.

The failure to complete corrective actions or improvement suggestions within the agreed timelines generates a culture of negativity or frustration within the workforce. The monitoring of the planned task completion required the development of a database with accessibility and flexibility to expand as the business needs changed.

The initial KPI target required 90% of all remedial/corrective actions completed by the planned date.

- **Reporting Hazards** are the free lessons as an incident has not occurred but is potentially likely. The potential to reduce actual incidents by encouraging the reporting of hazards was deemed critical to the development of a positive safety culture. A simple Hazard Reporting book was developed which allowed staff to carry the book at all times allowing the hazard and the remedial/corrective to be recorded.

An initial KPI target of 0.3 hazards per employee per month was assigned to an operation.

The Year 1 results achieved the ultimate goal of a 12 month period without a lost time injury although alarmingly the TRIFR remained high at 28.04. The success of the new positive performance initiatives were mixed but cultural change in the workplace is difficult and patience is required to achieve the end goal.

Year 2

The year 1 results were analysed and although an improvement were below the expected results. The primary causes for the results were determined to be lack of accountability/ownership of the KPI's and the supervisor's HSE skills set.

In year 1 KPI's were assigned to operations and not individuals, this was an intentional decision as history indicated if responsibility was assigned to an individual then others

believed they had no obligation to participate. Unfortunately the culture was not mature enough to self manage site base obligations and a change was required.

A review of the Supervisors HSE skill set identified a massive variation between the Supervisors and was demonstrated by the individual sites performance. To improve the Supervisors HSE knowledge and skills a four day course was developed "HSE Leadership".

- **Accountability/Ownership** of KPI targets were assigned to the Supervisors. The Supervisors were assigned the responsibility to ensure the tasks were completed, participate in the task but not to complete the tasks.
- **HSE Leadership** course attendance was mandated as a pre-requisite for in field Supervisors with the KPI target 100% of all Supervisors must attend within 6 months of appointment.

The Year 2 results achieved the ultimate goal of a 24 months period without a lost time injury. The cultural change was now gaining momentum but the journey was far from over.

Year 3

The year 2 results were analysed and demonstrated an enormous shift change in the Lead and Lag results, and in particular the business was now 2 years Lost Time Injury Free.

- TRIFR 18.63 down from 28.04
- LTIFR 0.00
- Lead Indicators 817 up from 434
- Incident reporting remained static

The review process identified:

- Assigning accountability/ownership of the KPI's to the Supervisors increased participation and engagement by the workforce.
- The Hazard reporting results almost doubled the KPI target and potentially prevented actual incidents as the operators were now identifying uncontrolled hazards in the workplace.
- The Supervisors demonstrated a far greater understanding of the HSE system and available tools and were more engaged in safety than prior to attending the HSE Leaders course. The feedback from the Supervisors was the course should not be limited to Managers and Supervisors.
- The completion of remedial/corrective actions initially appeared to achieve the 90% closure target but the review discovered a loophole in the system. Individual's assigned remedial/corrective actions could change the due date without flagging a warning to the system administrators.

Although Year 2 was successful changes were required to ensure the ultimate goal of Zero Harm.

- **Completion of remedial/corrective actions** within the scheduled dates was compromised due to the ability to change the due dates. To address this fault a report was developed to capture due date changes. All due date changes must now be authorised by the Business Group Manager for the division.
- **HSE Leadership** course attendance was now mandated as a pre-requisite for in field Supervisors and Leading Hands with the KPI target 100% within 6 months of appointment.
- **Safety Behaviour Observations** were developed as a subjective measure of the workforce's engagement and ownership of a safe working environment. The safety behaviour observations were designed as an informal process of observing an employee completing any task and engaging them in conversation about the process and their role within the business. The observation report is drafted away from the work area to prevent the watch dog mentality. The reports do not reveal the identity of the individual involved in the observation and the results of the observation will be communicated to the workforce at the monthly safety meeting.
- The Year 2 results achieved the ultimate goal of a 36 months period without a lost time injury. The cultural change was now becoming ingrained in the business and safety was part of a task not an addition.

Year 4

The year 3 results were analysed and demonstrated an enormous shift change in the Lead and Lag results, and in particular the business was now 3 years Lost Time Injury Free.

- TRIFR 4.97 down from 18.63
- LTIFR 0.00
- Lead Indicators 1330 up from 817
- Incident reporting 446 up from 137

The review process identified:

- HSE staff numbers were increased to assist the operations with managing the implementation of the safety management system.
- Training staff numbers were increased to improve the operator skill set and competencies.
- The authorisation process implemented for changes to due date of remedial/corrective actions resulted in a new focus on completion of actions which dramatically improved the engagement of the workforce.
- The information generated via safety behaviour observations enabled improvement opportunities in training, communication, client relationships and the safety management system.

Due the success of Year 3 the management team determined a year of consolidation would ensure the changes over the previous three years were embedded.

Year 5

The year 4 results were analysed and demonstrated an enormous shift change in the Lead and Lag results, and in particular the business was now 4 years Lost Time Injury Free.

- TRIFR 8.36 up from 4.97
- LTIFR 0.00
- Lead Indicators 3684 up from 1330
- Incident reporting 735 up from 446

The review process identified:

- The increase in TRIFR was due primarily to Restricted Work Injuries and of which 80% were precautionary. The majority of the RWI's were minor muscular skeletal strains e.g. "tightness in back". The Supervisors were now sending their staff to the doctors for precautionary examinations and the Lag indicators metrics were increasing.
- The increase in Lead indicator tasks without changing the KPI targets demonstrated a positive engagement by the workforce.
- The safety management compliance audit scores improved and were attributed to the increase in HSE staff, Training staff and Leading Hands attending the HSE Leaders course.
- The increase in reported incidents was determined to be a result of endearing a positive reporting culture with the required level of impunity to be successful.
- The increased number of reported incidents required greater time and effort to conduct investigations. The current system required the Supervisors to investigate the low level incident and be assisted by the HSE staff on the high level incidents. The review of incident investigations identified the quality of investigations conducted by the Supervisors failed to identify the Root Cause and the majority of corrective actions were focused on the low end of the hierarchy.

The year of consolidation in Year 3 enabled more data for review and to allow a more informed changes to improve the safety performance.

- **Incident Investigation** training is part of the HSE Leaders course but the course attendees receive no mentoring/coaching in the field post course. Now all persons conducting incident investigations will receive mentoring /coaching from a member of the HSE team. With the KPI target 100% of all HSE Leader course attendees within 1 month of attending the course.
- **Safe Task Observations** were developed as a measurable observation of procedural compliance, operator competency and procedural validity as the incident

investigations are identifying deficiencies in the procedures. A new KPI target introduced being 1 Safe Task Observation per Supervisor per week.

- **Incident Investigation remedial/corrective actions** must implement at least one control from the top three of the hierarchy of controls “ Elimination, Substitution or Engineering”

Year 5

The year 4 results were analysed and demonstrated an enormous shift change in the Lead and Lag results, and in particular the business was now 4 years Lost Time Injury Free.

- TRIFR 4.53 down from 8.36
- LTIFR 0.00
- Lead Indicators 5630 up from 3684
- Incident reporting 804 up from 735

The review process identified:

- The incident reporting rose slightly and the data supported the culture of reporting was entrenched with no evidence incidents were not being reported for fear of the consequences.
- The remedial/corrective actions developed post incident did include a top three hierarchy control but also included numerous amendments to existing procedures and the generation of new procedures. Over the last 4 years the safety management system had increased from 800 documents to 1260. This growth has impacted negatively on the business by creating confusion within the operations and requiring more resources to manage the system.
- With the exception of one all Lead Indicator KPI targets were exceeded and the completion of remedial/corrective actions closed by the due date achieved a company record or 99.8%.
- Internal compliance audit scores were the only KPI not achieved, although the audit scores were averaging 80% the KPI target was 90%. The obstacle prevent a higher score was determined to be the audit tool. The tool was designed for the parent company and aspects of the requirements were not applicable to our business.
- The Safety Behaviour Observations identified the people management skills of the Supervisors and Heading Hands were inadequate and resulting in poor communication and leadership.

Minor changes were deemed necessary to drive continuous improvement:

- **The HSE Leaders Course** was withdrawn from availability to allow a restructure and enhancement. Core skills modules were improved, leadership skills were introduced;

communication and counselling skills were also included on the agenda. Also the attendee's managers were required to hold a pre and post meeting attendee. The pre meeting was to allow the manager the chance to discuss his/her expectations and the post meeting was for both parties to discuss the learning's. Every course was now opened and closed by the CEO and the final session was attended by several members of the senior management team.

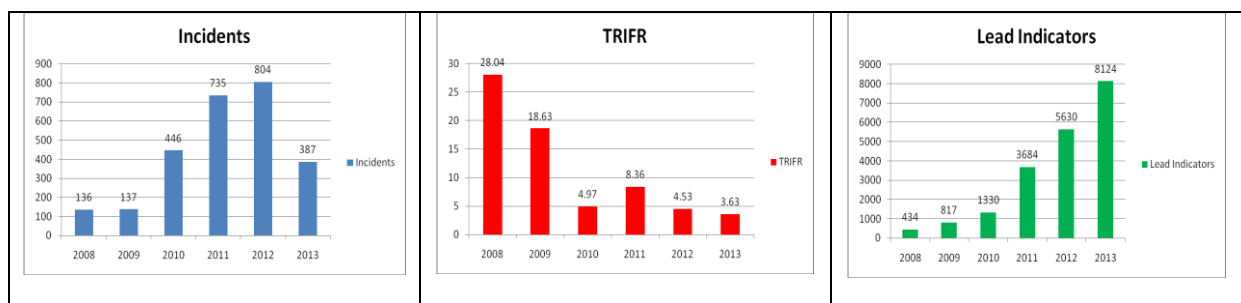
- **Business Specific Audit Tool** to be developed and trialled before implementation as the authorised audit tool.
- **Safety Management System** review and simplification by designing the documents specifically for the end user, considering format, language and utilising photographs. Remove all documents not essential to the operation of the business and host in a different server.

Year 6

The year 5 results were analysed and demonstrated continuous improvement in the Lead and Lag results, and the business achieved the milestone of 5 years Lost Time Injury Free.

- TRIFR 3.63 down from 4.53
- LTIFR 0.00
- Lead Indicators 8124 up from 5630
- Incident reporting 387 down from 804

The graphs below detail the Lead and Lag achievements over the 5 year journey, and demonstrate the direct connection between the reduction in TRIFR and the increase in Lead Indicator activities.



AS/NZS 4804:2001 and ISO 14004:1996 comparably define safety as;

“the measurable results of the occupational health and safety management system related to the organisations control of health and safety, based on its OHS policy, objectives and targets. Performance measurement includes measurement of OHS management activities and results.”

Industry worldwide reward their staff when safety metrics are achieved which often results in manipulation of figures to ensure bonuses are received. Rewarding people for working safely

is a flawed concept and until we change this the ultimate goal of Zero Harm will remain a goal and not a reality.

The journey of change commenced with four simple questions:

1. Do we know what can kill us or seriously injure us?
2. Do we know how to prevent this?
3. Is this practical?
4. Can we sustain this?

In truth measures don't change behaviours incidents with consequences do and unfortunately this is how we historically learn and change. Proactive safety is a cultural change and requires persistence to reinforce the behaviours and time to achieve the desired goals. A positive culture of accountability that holds the people accountable for their actions and inactions for leading indicators will ensure success.

The key to the success for this business was initially admitting a problem existed, the skills to develop a pathway to achieving the goals. The ownership of the project as numerous businesses in the past have experienced the use of consultants to effect change is not sustainable.

The journey will continue to ensure the ultimate goal of "Zero Harm" continues to be the driving force.