

Key Leading Indicator Matrix



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Here's a matrix of key leading indicators, their definitions and associated metrics put together by the Campbell Institute in Chicago, which can be used as a guide for improving your company's safety performance. For more on this matrix, read the [related article](#).

S=Systems-based, O=Operations-based, B=Behaviour-based

LEADING INDICATOR/ DESCRIPTION	ASSOCIATED METRICS
Risk assessment (S,O) Identification of the tasks, hazards and risks of a job prior to work, and the implementation of protective measures to ensure work is done safely	Number of assessments conducted per plan
	Percent of assessments completed per plan
	Ratio between the levels of risk identified (high, medium, low)
	Scoring the steps of an operation on severity, exposure and probability
	Number of assessments communicated
	Number of risks mitigated or controlled
	Number of assessments validated by EHS manager
	Percent of assessments re-evaluated and revalidated
	Percent of routine tasks identified
	Percent of tasks identified
	Percent of risk assessments completed per schedule/plan
	Number of assessments to evaluate potential severity

Hazard identification/ Recognition (S) Evaluations and assessments (not necessarily audits) through management and employee observations to identify potential hazards	Number of near miss reports
	Number of unsafe observations (conditions or behaviours)
	Number of safe observations (conditions or behaviours)
	Number of unsafe observations per inspection
	Number of unsafe observations reported per employee per time period
	Number and percent of previously unknown or uncategorized hazards discovered
	Inspection count (collection of observations)
	Ratio of safe to unsafe observations
	Weighted percent of safe observations (using risk matrix)
	Frequency of 100% safe
	Number of checklists filled out
	Number of comments for unsafe observations that clarified nature of the hazard
	Number of people trained in hazard identification
	Number of unsafe observations recorded by a trained person
Risk profiling (S) A review of the collected hazard identification data, prioritization of preventable and corrective actions, and identification of areas for continuous improvement	Correlation rate between leading and lagging indicators
	Number of reviews and comparisons (to check quality of the process)
	Number of repeat findings
	Number of gaps in hazard identification process
	Number of incidents with a root cause related to inadequate risk assessment
	Number of root causes not previously categorized or identified in risk assessment
	Number of assessments deemed unacceptable
	Percent of life-threatening risks, low severity risks, etc.
	Percent of reduction in overall risk score
	Number of risks by specific category (such as fall protection, confined space, housekeeping, etc.)

Preventative and corrective actions (S,0) Any measure to correct behaviour that could result in failure or defect, as well as any proactive measure to prescribe safe behaviour and prevent non-conformance	Average days to close
	Number of days to completion
	Percent closed on time (within X hours or by due date)
	Number of open issues that need to be closed
	Number of open issues that haven't yet had a corrective action assigned
	Percent of preventative and corrective actions communicated
	Number of effective corrective actions verified by managers
	Number of corrective actions for critical issues validated for effectiveness by managers
	Number and percent of issues in conformance with recommended corrective actions
	Percent or ratio of corrective actions at each level of control (according to hierarchy of controls)
	Percent or ratio of corrective actions according to hazard type (such as confined space, fall protection, etc.)
	Number of issues flagged at 30 days, 60 days, etc.
	Number of corrective actions prioritized by risk (such as high severity, low severity, life-threatening, etc.)
	Number of divisional targets that have dropped below a 90%-completed rate
Management of change process (0) Formal process to ensure appropriate planning around HR activities, union negotiations, seasonal changes in employment and changing management	Percent of tasks completed
	Number of facilities running 10% overtime
	Number of facilities experiencing X% turnover
	Number of gaps in management of change review
	Number of new assessments for changes in processes or equipment
	Number of new trainings for operations
Learning system (S) Any activity or program (such as training, communication, coaching and on-the-job training) to teach employees and management about EHS issues and procedures (skills, knowledge and values) and learn from prior incidents	Number and percent of completed training goals (by individual, group or facility)
	Percent of compliance versus goal
	Number of training hours (per hours worked per facility/BU/corporate or per time period)
	Number of training hours (per employee, per site, per time frame)
	Number of incidents with a root cause that includes lack of training
	Number of certified trainers
	Dollars spent per year on training
	Number of new employees who complete orientation
	Number and percent of positive post-training evaluations
EHS management system component evaluation (S) An audit of an organization's safety management system to assess conformance with system expectations and goals	Maturity score (percent of system component compliance)
	Number and frequency of audits performed
	Number of findings (instances of non-conformance)
	Number of corrective actions
	Number of management system root causes identified by incident investigations

Recognition, disciplinary and reinforcement program (S) The recognition of safe behaviour or the correction of unsafe behaviour to reinforce the objectives of the EHS management system	Percent of personal EHS system goals met
	Number of disciplinary actions
	Number of incident root causes tied to disciplinary action
	Number of recognitions for safe behaviour
Leading indicator component evaluation (S) Correlation and trend analysis of key performance indicators to evaluate the outcomes of leading indicator implementation	Year-over-year analysis of correlation rates
	Annual analysis of correlation rate
	Number of comparisons of predictive measures to performance outcomes
	Number and percent of predictive measures meeting predictive goals
	Number and percent of predictive measures meeting performance outcomes
Communication of safety (S) Sharing of information to stakeholders, employees and management regarding safety metrics/indicators and EHS policy	Number of users of EHS dashboard
	Number and frequency of employee meetings
	Number of tailgates/pre-shift safety talks completed
	Number of bulletin boards with current/relevant information
	Percent conformance with communication expectations/needs
	Frequency of communication to stakeholders, employees and management
	Number of website hits
	Percent completed and communicated
Safety perception survey (S) Polling employees on impressions and perceptions of management and/or organizational safety performance	Number and frequency of perception surveys
	Percentage of employees polled
	Response rate
	Percent of positive/negative poll results
	Employee-management gap analysis
Training (O) Any event that attempts to enrich or increase knowledge, skills and ability to prevent incidents and/or control hazards	Ratio of training hours to work hours per month
	Number of safety talks and safety training sessions
	Number of assessments to determine the type of training needed
Compliance (O) Adherence to standard operating procedure	Number of regulatory inspections without findings (not necessarily fines)
	Percent of defect-free agency inspections
Prevention through design (O) Implementation of design elements to eliminate defects and ensure only one safe way of performing a task	Number or percent of designs that pass validation or quality test
Leadership engagement (B) Leaders' behaviours and actions that demonstrate their extra effort and commitment to ensuring safety	Number of employee suggestions implemented by leadership
	Number of employees volunteering for initiatives
	Number of managers/supervisors participating in critical design reviews
	Percent of positive ratings of managers and supervisors by employees

Employee engagement and participation (B) Employee behaviours and actions that demonstrate their extra effort and commitment to ensuring safety	Participation rate
	Number of on-the-job observations from employees
	Number of off-the-job observations from employees
	Number of employees personally engaged by supervisors in walk-arounds
	Percent of coached observations
	Percent of employees documenting observations
	Number and quality of comments
	Percent of job turnover
	Number of grievances submitted
	Number of employees leading safety meetings
At-risk behaviours and safe behaviours (B) At-risk behaviours or safety violations that are observed by individuals, supervisors and management	Number of observations
	Ratio of positive to negative observations
	Number of observers
	Percentage of supervisors meeting observation goals
	Ratio of peer-to-peer observations to supervisory observations
	Hazard severity of observations
	Ratio of high-risk observations to low-risk observations
	Percent of coached observations
Area observations/walk-arounds (B) A workplace tour to observe the safety performance of people (such as activities, behaviours, work tasks)	Number of walk-arounds
	Number of supervisors meeting goals
	Percent meeting safety performance standard
	Percent deviating from safety performance standard
Off-the-job safety (B) Efforts aimed at managing, tracking and reducing incidents and injuries that occur outside the workplace	Number of off-the-job observations from employees
Permit-to-work systems (S) Formal written procedures to control types of work that are potentially hazardous	Number of safety inspections and audits
	Number of gaps in completion
	Number or percent of supervisors and managers who have completed training in permit-to-work systems
Equipment and preventative maintenance (O) Identification of critical pieces of equipment for more frequent maintenance when it's nearing the end of its "life"	Percent of maintenance time spent on planned versus unplanned maintenance
	Number of defects found in equipment