COAA
Construction Owners
Association of Alberta

Leading Indicators of Safety Performance

A Best Practices Guideline

NOTICE TO READER

When it was first issued/re-issued, this best practice guideline embodied the consensus best thinking in our industry. Many of the principles, procedures, checklists, etc. are still relevant and can be adapted for current use. However, users are cautioned that this best practice has not been updated, so a critical assessment should be made when adapting – in particular, for sections that reference standards, regulations or legislation.

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This Best Practice guideline ("guideline") was developed through a consensus process approved by COAA. This process brings together volunteers representing varied viewpoints and interests to achieve a reasonable consensus on a generic guideline for industry use. The content of this guideline does not represent the views of any particular committee member. This document is a general guideline and COAA strongly recommends legal and other professional advice being obtained to complement and clarify specific adopting of this guideline. This guideline is also subject to periodic review and readers should ensure they are referencing the most current version of this guideline. Suggestions for improving this guideline are welcome and can be submitted directly to COAA.

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Construction Owners Association of Alberta
Leading Indicator – Best Practice

In the fall of 2003 a discussion took place at the monthly COAA Safety Committee Meeting regarding the need to have common, consistent metrics to evaluate the safety performance of C ontractors working on various plant sites. The discussion revolved around 'lagging indicators' and the need to identify 'leading indicators' that could be used for this effort. A number of Safety Committee members volunteered to be part of a working group that would come up with 'leading indicators' that could be used to evaluate the performance of Contractors.

At the first meeting the Working Committee developed a path forward which would include developing a list of 'leading and lagging indicators'. This list was compiled from various sources – included a best practice that had previously been developed by the Construction Industry Institute (CII). In the end the Working Committee had a list of approximately 300 (leading and lagging) activities.

The Working Committee ranked each of the activities and identified the Top 30 Leading Indicators. This list was sent to all of the COAA Safety Committee members; and the members were requested to rank these indicators. From the information that was provided by the Safety Committee – the working committee came up with a list of the Top 10 Leading Indicators. It should be noted that in reality these indicators are really activities.

The Top 10 Leading (Activities) Indicators:

- **Behavioural based 0bservation process is in place and working**
- Focus (compliance) observation process is in place and working
- Near miss/near hit reporting process is in place and working
- Employee perception surveys are conducted to determine the state of EH&S health
- **Pre-screening of employees (D&A) is conducted**
- **Contractor selection (EH&S) process is in place prior to the start of a Project**
- Active management safety participation – tours / walkabouts / written communications
- Supervisor's safety activity is evaluated at regular intervals
- Hazard identification/analysis process is in place prior to the start of a Project
- **FLRA are conducted prior to the start of new work/at the beginning of shift**

The working committee decided that as part of its mandate they would develop 'best practices' for each of the 'leading activities'. Fortunately four (**noted in bold**) of the activities had already had 'best practices' developed by the COAA Safety Committee and thus the other six were assigned to various Working Committee members.

- Focus (compliance) observation process is in place and working – Pat Robinson - Mammoet
- Near miss/near hit reporting process is in place and working – Sterling Rideout - Colt
- Employee perception surveys are conducted to determine the state of EH&S health – Doug Kelly – Lockerbie and Hole
- Active management safety participation – tours / walkabouts / written communications – Doug Kelly– Lockerbie and Hole
- Supervisor's safety activity is evaluated at regular intervals – Sterling Rideout - Colt
- Hazard identification/analysis process is in place prior to the start of a Project – Murray Evenson – Lockerbie and Hole

Once a 'best practice' was developed – it was circulated for feedback amongst the Working Committee. Once it was deemed to be complete – it was forwarded to the COAA Safety Committee members for feedback. This feedback was incorporated in to the final version of the 'best practice'.

In May of 2004 as part of the Annual COAA Best Practices Conference a workshop was held by the Working Committee to review their activities. All of the 'best practices' and the presentation made at the Best Practices Conference are attached.

Mark L. Halama
Chair – Leading Indicator Best Practices Working Committee
Suncor Energy Inc.

DEPARTMENT: Construction Owners Association of Alberta
SUBJECT: Active Management Safety Participation – Tours, Walkabouts, Written Communications – Best Practice

1. PURPOSE

- To demonstrate line management support through positive behavior, active engagement with the employees performing the work, proper written communication and information sharing.

- To provide an informal forum with construction management where insight into the Environment, Health, and Safety (EHS) perspectives of the workers can be mutually shared without fear of reprisal.

1.1 Scope

The scope of this Standard encompasses active construction line management participation that contributes significantly to employee motivation and a positive job culture. Active management safety participation – tours, walkabouts, written communication, has been identified as one of the top ten (10) Leading Indicators developed through the Construction Owner's Association of Alberta.

1.2 Responsibilities

The Chairperson of the Construction Owners Association of Alberta is responsible for identifying all active management safety participation types that will be produced by the Construction Owners Association.

The Lead Document Controller, Construction Owners Association of Alberta is responsible to ensure the documents are registered in accordance with the Association's protocol and linked to the appropriate website portal.
Further, the Lead Document Controller is responsible for updating of this Standard as directed by the Chairperson of the COAA.

Senior construction managers are responsible to implement this Standard in their respective jurisdictions. It is a proven fact that active management safety participation can be an important indicator of an organization's corporate culture. And positive corporate culture normally contributes directly to an organization's overall success!

1.3 Definitions

Active – engaged in actions, activities, responsibilities, productive, rather than mere existence of state

Line Management – includes all senior, middle and front-line supervision.

Standard – criteria adopted by professional bodies to prescribe acceptable practice; standards are sometimes adopted by reference in statutes or regulations

2. STANDARD

2.1 The following "active management safety participation factors" shall be included within construction line management role definitions:

2.1.1 Regional Managers, Operations Managers, Construction Managers

The Project Regional, Operations, Construction Managers have the global responsibility for the engineering, procurement, construction, pre-commissioning, and upon request – “start-up standby” of the project; and prior to the start of the project are responsible to:

- provide leadership through positive behavior, EHS planning, written communications, tours, and walkabouts
- champion the communication of the EHS expectations to the project team on a personal basis
- measure the EHS accountability of all line management levels through personal monitoring of project EHS performance factors
- participate in a collective line management risk assessment of the scope of work for the project which includes identifying all applicable legislation
- ensure a hazard identification/analysis process is in place, prior to the start of the project
- ensure a contractor/subcontractor selection (EHS) process is in place, prior to the start of the project
- ensure a pre-hiring screening process (D&A) is in place, prior to the start of the project (as applicable)
- significantly contribute to the creation of a corporate culture where EHS is integrated into the daily business with the equal weighting factors associated to scheduling, productivity, quality, and cost effectiveness
- provide the physical, financial, and time management support necessary to execute the EHS management systems
- promote the Target Zero/Journey to Zero philosophy where incidents are an unacceptable consequence of the work performance
- provide positive EHS recognition for outstanding performance through a behavioral based safety recognition program
- ensure the performance of periodic employee perception surveys to determine the state of the EHS health
- submit a site specific EHS execution plan within a specified client time frame of award, or, prior to commencement of work

2.1.2 Project Manager

The Project Manager has the direct responsibility for the management of the scope of work and is directly accountable to the Construction Manager, with the following EHS expectations:

- demonstrate ownership, leadership through positive behavior, and actively participate in all aspects of the EHS management system – inspections, observations, written communications, information sharing, tours, walkabouts, positive recognition and employee perception surveys
- communicate the EHS responsibilities to each direct report on a personal basis
- measure EHS accountability of all reporting line management levels through personal monitoring of project EHS performance factors
- participate in a collective line management risk assessment of the scope of work for the project which includes identifying all applicable legislation
- ensure a hazard identification/analysis process has been completed/established for the project

- ensure a contractor/subcontractor selection (EHS) process has been completed/established for the project
- ensure a near miss/near hit reporting process has been established and is monitored for effectiveness
- ensure a focus (compliance) observation process has been established and is monitored for effectiveness
- ensure a pre-hiring screening process (D&A) is in place, prior to the start of the project (as applicable)
- ensure field level risk assessments (FLRA) are conducted prior to the start of new work/at the beginning of shift
- ensure a behavioral based observation process has been established and is monitored for effectiveness
- significantly contribute to the creation of a project culture where EHS is integrated into the daily business with the equal weighting factors associated to scheduling, productivity, quality, and cost effectiveness
- promote open communication, cooperation and trust between all stakeholders to optimize the project EHS objectives
- provide the physical, financial, and time management support necessary to execute the EHS management systems
- select contractors/subcontractors capable of complying with the EHS project expectations
- advise the contractors/subcontractors of site specific hazards that may impact their scope of work performance
- verify implementation of the contractor/subcontractor site-specific EHS plan
- monitor and commend/correct individual safety performance of all levels of management; contractors, subcontractors and workers
- monitor compliance to established EHS management system requirements and review findings accordingly
- take the opportunity to interact with all personnel concerning improvement of procedures/safe work practices
- in conjunction with the EHS Manager/Specialist, establish a frequency for EHS management system audits, and actively participate
- use EHS compliance as a measure of line supervision and contractor management effectiveness
- lead and/or participate in the investigation of major/unacceptable incidents
- implement a recommended tracking system where all EHS action items can be systematically monitored to acceptable completion status
- promote the Target Zero/Journey to Zero philosophy where incidents are an unacceptable consequence of the work performance
- provide positive EHS recognition for outstanding performance through a behavioral based safety recognition program
- ensure the performance of periodic employee perception surveys to determine the state of the EHS health
- act as the project's representative when dealing with any legislative regulators
- ensure all documentation control requirements under applicable legislation, due diligence, and EHS programs are in place and secure for inspection
- actively support the EHS personnel assigned to the project within their roles of advisor, monitor, resource, and auditor

2.2 Field Supervision – Superintendent, General Foremen, Supervisors/Foremen

This level of management is responsible for the daily, direct supervision of the "hands-on" workers. They are responsible to plan and organize the work within a safe a

healthy working environment, according to schedules and within planned cost estimates.

The EHS responsibilities of these positions are:

- become knowledgeable in the EHS management systems and individual responsibilities, as identified for the work to be performed
- communicate the EHS responsibilities to each direct report on a personal basis
- demonstrate ownership, leadership through positive behavior, and actively participate in all aspects of the EHS management system – inspections, observations, written communications, information sharing, tours, walkabouts, positive recognition and employee perception surveys
- measure EHS accountability of all reporting line management levels through personal monitoring of project EHS performance factors
- participate in a collective line management risk assessment of the scope of work for the project which includes identifying all applicable legislation
- ensure the pre-hiring, pre-access screening process (D&A) is actively complied with (as applicable)
- ensure the hazard identification/analysis process established for the project is actively complied with, and monitored for effectiveness
- ensure the near miss/near hit reporting process established for the project is actively complied with, and monitored for effectiveness
- ensure the focus (compliance) observation process established for the project is actively complied with, and monitored for effectiveness
- ensure field level risk assessments (FLRA) are conducted, prior to the start of new work/at the beginning of shift
- ensure the behavioral based observation process established for the project is actively complied with, and monitored for effectiveness
- significantly contribute to the creation of a project culture where EHS is integrated into the daily business with the equal weighting factors associated to scheduling, productivity, quality, and cost effectiveness
- promote open communication, cooperation and trust between all stakeholders to optimize the project EHS objectives
- ensure that all the crew workers know and understand their specific EH&S responsibilities and are held accountable for their behaviors
- ensure that all workers are fit for work and competent to perform their assigned tasks
- ensure the proper equipment and materials are readily available to the workers
- ensure that pre-use checks are performed on equipment and materials to verify safe status for usage
- identify and evaluate EHS issues during the pre-planning of scheduled work, and establish acceptable controls to create a safe working environment
- participate in the pre-job planning and Job Hazard Analysis (JHA) on all new or potentially hazardous work (Field Level Risk Assessment)
- supervise the workers to ensure compliance to the project management system policies, standards, procedures, safe work practices, rules
- implement action plans to correct reported or observed unacceptable physical conditions or unsafe work practices, at-risk behaviors
- enforce EHS related work rules, and take action to ensure compliance
- conduct serious/minor incident investigations, EHS meetings, toolbox meetings, pre-job meetings for each new task, and prepare all required reports for submission, approvals, record keeping
- know and understand line management specific roles and responsibilities in potential emergency situations

- verify or provide adequate training, training resources to line specific workers to ensure they are competent to perform their required tasks
- maintain all formal/informal documentation of EHS activities to support performance requirements, be readily available for audit purposes, and to confirm a due diligence position, if required
- promote the Target Zero/Journey to Zero philosophy where incidents are an unacceptable consequence of the work performance
- provide positive EHS recognition for outstanding performance through a behavioral based safety recognition program
- actively participate in the performance of periodic employee perception surveys to determine the state of the EHS health
- actively support the EHS personnel assigned to the project within their roles of advisor, monitor, resource, and auditor

2.3 Loss Control Activity Calendars

Line management activity calendars shall be developed, prior to commencement of the project. They must encompass each line specific management activity, the frequency, a tracking mechanism to measure stewardship, and a one-up management monitoring signature within specific time frames.

3. IMPLEMENTATION

Senior construction management of their respective companies shall ensure implementation of this Standard within their areas of accountability.

4. INTERPRETATION AND UPDATING

The Safety Chairperson of the Construction Owners Association of Alberta shall ensure interpretation and updating of this Standard.

5. APPROVED BY

Peter Dunfield
Safety Chairperson
Construction Safety Association of Alberta (COAA)

DEPARTMENT: Construction Owners Association of Alberta

SUBJECT: Employee Perception Surveys Are Conducted To Determine the State of The Environment, Health and Safety Culture – Leading Indicator – Best Practice

1. PURPOSE

- To obtain feedback from the employees on the effectiveness of the current EHS culture and related project activities.

- To provide senior construction management insight into the EHS perspectives of the different departments and reporting line management.

1.1 SCOPE

The scope of this Standard includes leading indicators managers need to know about, and different types of surveys that can be used to identify how employees feel about these critical factors that contribute to a healthy organization. In addition, are sample parameters of an employee perception survey for construction, based upon the ten (10) Leading Indicators developed through the Construction Owner's Association of Alberta.

1.2 RESPONSIBILITIES

The Safety Chairperson of the Construction Owners Association of Alberta is responsible for identifying all perception survey types that will be produced by the Construction Owners Association.

The Lead Document Controller, Construction Owners Association of Alberta is responsible to ensure the documents are registered in accordance with the Association's protocol and linked to the appropriate website portal. Further, the Lead Document Controller is responsible for updating of this Standard as directed by the Chairperson of the COAA.

Senior construction managers are responsible to implement this Standard in their respective jurisdictions. It is a proven factor that health and safety performance can be an important indicator of an organization's overall performance. Today's successful managers need more than a "standard" safety survey!

1.3 DEFINITIONS

Perception – process of organizing and interpreting information obtained through the senses; the main avenues of perception include visual, auditory, touch and kinesthetic – a sense stimulated by body movement and tensions.

Standard – criteria adopted by professional bodies to prescribe acceptable practice; standards are sometimes adopted by reference in statutes or regulations.

Line Management – includes all senior, middle and front-line supervision

2. STANDARD

2.1 Critical factors to evaluate for a safe, healthy organization and a positive job climate.

Senior construction management shall ensure the following leading indicators are evaluated within their employee perception survey:

- Corporate Culture
- Leadership and Planning
- Communications
- Hiring & Placement
- Benefits
- EHS, Quality, and Continuous Improvement
- Career Development
- Employee Role Definition
- Your Immediate Supervisor
- Employee Development Training
- Respect/Treatment of Employees
- Employee Empowerment
- Teamwork/Cooperation
- Organizational and Employee Diligence
- Physical Working Conditions
- Stress/Workload
- Satisfaction with the Job
- Recognition/Rewards
- Satisfaction with the Company
- Job Security/Stability

The perception survey questions shall be challenging, and created with the belief that all of the above are significant contributing factors to the state of a safe and healthy organization.

2.2 Example employee perception surveys that contribute to the state of the EHS culture.

Senior construction management shall ensure that annually, creditable employee perception surveys are conducted that encompass the leading indicators of subsection 2.1 above.

2.2.1 **Corporate Culture Surveys** – a way to take the pulse of the organization - the vision of senior management of a culture they believe it takes to compete successfully in the competitive landscape. It is especially necessary to measure when there is suspicion the culture is out of sync with management's desired culture, when management has determined the culture must be changed to ensure the success of the enterprise, or when there has been a leadership change at the top of the organization.

2.2.2 **Productivity Surveys –** anything that gets in the way of workers' abilities to produce quality products and services efficiently must be carefully examined. The productivity survey identifies the barriers to productivity in place at an organization and will reveal the information required to tactically target the identified barriers impeding an organization.

Examples of barriers to productivity:

- Improper training
- Out of date tools and equipment
- Overemphasis on centralized decision making
- Politics causing different parts of the organization to pull in different directions
- Incentives that reward maintenance of the status quo or unproductive employees as much as productive ones
- Excessive risk aversion
- Improper productivity measurement
- Ignoring or not soliciting employee input

2.2.3 **Environment, Health & Safety (EHS) Surveys –** typically, most organizations perform "standard" EHS surveys around the number of injuries/occupational illnesses due to accidents. This is a worthy goal but to the employees involved in the accidents, this measurement tool is reactive and of little solace. The modern day methodology for measurement is to proactively benchmark against the best, and score your company in percentages against the best!

In addition to the above, evaluate the belief that injuries can be prevented, the priority people think others give to safety, the extent of safety training, the quality of the safety rules, the extent the safety rules are obeyed, to what extent disciplinary action is taken, to what extent injuries & incidents are reported, investigated, and followed- up, and include subcontractors within the evaluation.

To achieve and maintain safe operational excellence, the safe work plan management system must be implemented, managed, and measured as a continuous improvement cycle. The employee perception survey is the best indicator toward institutionalization.

2.3 Employee perception survey parameters for construction, based upon the ten (10) leading indicators identified by the Construction Owners Association of Alberta (COAA)

Senior construction management shall ensure that the COAA employee perception survey parameters of their ten (10) leading indicators are part of the execution plan for all projects. Project specific employee perception surveys can be created from the leading indicator parameters listed.

2.3.1 Contractor selection (EHS) process is in place, prior to the start of a project.

- Do all the contractors/subcontractors have WCB clearance?
- Are all the contractors/subcontractors in a WCB discount percentage?
- Have the contractors/subcontractors provided a client evaluation of their previous year contracts/projects?
- Do the contractor/subcontractors employ full-time/part-time EHS professionals -if so, have their current project resumes been approved
- Have all the contractors/subcontractors had their EHS Manuals/Safe Work Plans approved?

2.3.2 Hazard identification/analysis process in place, prior to the start of the project.

- Has a collective risk review been conducted on the scope of work?

- Have the identified risk factors been assigned adequate controls or eliminated?
- Have the potential loss exposures associated to the specific tasks been evaluated and controls/elimination been identified? (JHA's)
- Has the field level risk assessment process been established? (FLRA's)
- Is there an ongoing hazard/risk analyses process in place to pro-actively prevent similar undesirable events?

2.3.3 Pre-hiring screening (Drugs & Alcohol).

- Is pre-hire screening for D&A mandatory, pre-placement, random, for cause only, for sensitive positions, or not applicable?
- Is there an established criteria/process for testing for any/all of the above, as applicable?
- Does the project have the support of the worker representatives for any/all D&A applications?
- Is the prime contractor applying the D&A principles of the Canadian Model with integrity?
- Has an agreement/contract been established with a recognized D&A testing medical facility and applicable line management made aware of the protocol?

2.3.4 Active management safety participation – tours, walkabouts, communications.

- Has the Project line management team participated in a collective risk assessment of the scope of work?
- Has the Project line management team participated in a Project kick-off meeting with the client/prime contractor to clarify, verify, and receive approval for the Project execution plan, terms and conditions?
- Does the Project line management participate in planned inspections, compliance observations, behavioral based observations, group communication/safety meetings, field level risk assessments, and recognition award presentations, as applicable?
- Does the Project line management team provide leadership that promotes motivation and contributes to creating a positive job climate?
- Does the Project have a structured loss control bulletin board where senior management communications are readily available to the employees?

2.3.5 Supervisor's safety activities are evaluated at regular intervals.

- Are the supervisor's safety qualifications adequate for the role?
- Does the supervisor participate in the job hazard analysis process?
- Does the supervisor participate in the field level risk assessments?
- Does the supervisor chair the safety meetings and toolbox talks?
- Does the supervisor coach, mentor, communicate, manage with integrity?

2.3.6 Field level risk assessments (FLRA) are conducted prior to start of new work/at the beginning of shift.

- Does the Project have approved FLRA assessment cards?
- Have the general foremen, foremen and the workers been trained in the protocol for FLRA's?
- Are the FLRA's being completed and used with integrity?
- Who is the custodian of the FLRA's at the end of the day?

- Is there an ongoing monitor measuring the integrity of the FLRA process?

2.3.7 Near miss/near hit reporting process in place and working.

- Does the Project have a system for near miss reporting?
- Is it non-punitive?
- Does immediate supervision encourage near miss reporting?
- Who provides the feedback on near miss actions taken?
- Are lessons learned from near misses communicated to the work force?

2.3.8 Focus (compliance) observation process in place and working.

- Is there a structured observation process set up for the Project?
- Does the observation team consist of both management and workers?
- Who does the record keeping for the observation tours?
- Is the observation process being applied with integrity?
- Are the results of the observation tours shared with the work force for lessons learned?

2.3.9 Behavioral based observation process in place and working.

- Is there a structured behavioral based observation process set up for the Project?
- Does the observation team consist of both management and workers?
- Have the observation team been formally trained?
- Who does the record keeping for the observation tours?
- Is the observation process being applied with integrity/lessons learned?
- Are there recognition rewards for exemplary positive behavior?

2.3.10 **Employee perception surveys are conducted to determine the state of EHS health**.

- Does the employee perception survey incorporate any of the critical factors to evaluate for a safe, healthy organization and a positive job climate, as per subsection 2.1?
- Is the employee perception survey based upon the parameters of the COAA ten (10) leading indicators for construction due diligence?
- Is the employee perception survey being benchmarked against a current leader in a similar industry?
- Will the findings of the employee perception survey be shared with all the stakeholders?
- Will the stakeholders be a part of developing the path forward?

3. IMPLEMENTATION

Senior construction management of their respective companies shall ensure implementation of this Standard within their areas of accountability.

4. INTERPRETATION AND UPDATING

The Safety Chairperson of the Construction Owners Association of Alberta shall ensure interpretation and updating of this Standard.

5. APPROVED BY _____

Peter Dunfield
Safety Chairperson
Construction Safety Association of Alberta (COAA)

DEPARTMENT: Construction Owners Association of Alberta
SUBJECT: Evaluating Supervisor Activities at Regular Intervals – Leading Indicator – Best Practice

1.0 PURPOSE

To communicate to COAA Members a best practice for the implementation of a process for evaluating supervisor safety activities at regular intervals.

1.1 SCOPE

To identify measurement tools that would allow accountability from supervisors in such areas as incident investigations, inspections, orientations and training, the measure should tell you if you are getting these performances. It should not measure only failures (incidents) as an indication of whether you are getting the desired performances.

Obviously no one measure will meet all of the safety criteria we use in our industry.

2.0 STANDARD

In safety work, there are three ways of measuring supervisory safety performance. We can measure activities of the line or we can measure the results of these activities or we can use combination of both. The most used measure seems to be based on results.

2.1 RESULTS MEASUREMENT

SYSTEMS

1) Charge incidents to departments
    A. Charging claim costs to the line
    B. Including incident costs in the profit and loss statements
2) Prorate insurance premiums
3) Put safety into the supervisor's appraisal
4) Have safety affect the supervisor's income

RESULTS MEASUREMENT

1) Number of incidents
    A. Incidents
    B. Injuries
    C. Other
2) Costs
3) Frequency and severity indicators
4) Estimate costs
5) Loss ratios
6) Costs of damage
7) Number of unsafe acts
    A. Sampling

The above is a partial listing of the things that we might consider measuring for results. One of the best means of doing this is to charge incidents to the supervisor, which they occurred. Any recordable incidents should show up in the supervisors record. Here we are measuring the supervisor in terms of dollars, which is a far better measuring stick than any other that we have today. Putting safety into supervisor appraisal is effective for

when line supervisor are appraised on safety records as well as on production records, they generally become for more interested in safety and begin to do something about it.

2.2 ACTIVITIES MEASUREMENT

ACTIVITIES TO BE MEASURED

1.) Safety meetings that supervisor holds
2.) Tool box meetings
3.) Activity reports on safety
4.) Inspection results
5.) Incident investigations
6.) Incident reports
7.) Job Hazard analysis

SYSTEMS

1.) Regular reports
2.) Sampling
3.) SCRAPE
4.) Performance rating

The above lists some of the items that management might measure the supervisor against to determine what they are doing to prevent incidents from occurring. This is more important than the measurement of results because it measures the line effort in controlling losses before the incidents have happened.

Management can measure line supervisors to see whether they are utilizing such techniques of incidents control as toolbox meetings, JHA's, inspections, orientations and incident investigations. Focus observations, employee safety surveys and safety meetings. When management measures these activities they are setting up a system of accountability for activities.

We also mentioned in the above list systems. Regular reports required from supervisors are a simple system. An example of such a report is shown below.

REPORT OF SUPERVISOR'S SAFETY ACTIVITIES

Supervisor_____ **Department**_____
Date_____ **This Report Covers**_____ **to**_____

Inspections Made

Date of Inspection_____	No. Hazards Corrected_____	No.Recs. to Mgmt._____
Date of Inspection_____	No. Hazards Corrected_____	No.Recs. to Mgmt._____
Date of Inspection_____	No. Hazards Corrected_____	No.Recs. to Mgmt._____

Meetings Held

Tool Box Meeting

Date_____ No. Employees_____ Subject_____
Date_____ No. Employees_____ Subject_____
Date_____ No. Employees_____ Subject_____

Other Meetings (Explain)

Incident Investigated

Number of Incidents Investigated this period_____
Number of Hazards Corrected_____
Number of Recommendations to Management_____
Comments:

Employee Contacts

New Employee Safety Orientation

Name_____ Date_____ Name_____ Date_____

Name_____ Date_____ Name_____ Date_____

Name_____ Date_____ Name_____ Date_____

Other Employees

Name	Date	Subject	Name	Date	Subject

Use of Safety Materials **List Materials Used this Period** **Incidents Record**	**This Period**	**Year to Date**
Number First Aid Cases		
Number Doctor Cases		
Number of Lost Time Cases		
Man Hours Worked		
Frequency Rate		
Severity Rate		

Comments:

2.3 CRITICAL ACTIVITIES

In the past, we have tended to use inspection for the purpose of seeking out hazards. We have used incident investigation for the purpose of identifying an unsafe act or an unsafe condition and we have used record keeping to computer frequency and severity rates. Inspections have been used to spot conditions, but seldom to spot acts. Investigations have been used to unearth symptoms more often than causes. Records have been used to tabulate incident types, incident agencies, and injury types more often than incident causes. Let us look at each briefly.

1.) Inspections

The single most important reason for management making inspections is seldom mentioned. It is to measure the supervisor's performance in safety. If this inspection is used as a measurement tool, the line manager will inspect more often to ensure that conditions remain safe and that fewer unsafe acts occur and not wait until the safety specialist comes around to do the inspection job.

It is generally agreed that responsibility for conditions and for people belongs to the line supervisor. Thus so should responsibility for the primary safety inspection. By primary safety inspection we mean the inspection intended to locate hazards. Any inspections performed by staff specialists than should be only for the purpose of auditing the supervisor's effectiveness and are a direct measurement of safety performance and effectiveness.

2.) **Investigation**

The primary incident investigation function has always been the supervisor's. The tools that we give the supervisor ought to lead to determination of some of the many underlying causes. It is proper that the line supervisor should investigate and be allowed to determine what really happened. If we, as management, are going to measure performance in investigation, then we must routinely rate the supervisor.

3.) Injury Records

Injury records should be designed so that they measure the line manager and to measure the results of the line manager's safety performance, they should be set up so that:

A. The incident records are kept by supervisor
B. They give some insight as to how the incidents seem to be happening (agency, body part, event etc.)
C. They are expressed eventually in terms of dollars by department (by Supervisor)
D. They conform to any legal and insurance requirements

2.4 INCIDENT INVESTIGATION RATING SHEET

		Circle One					
1.)	Was it on time?	Yes-5pts.				No-0 pts.	
2.)	Was seriousness indicated?	Yes-5pts.				No-0 pts.	
3.)	Does it say where it happened?	Yes-5pts.				No-0 pts.	
4.)	Can you tell exactly what the injury is?	Yes-5pts.				No-0 pts.	
		Circle One					
5.)	How many acts and conditions are listed?	5	4	3	2	1	0
6.)	How many causes are identified?	5	4	3	2	1	0
7.)	How many corrections were made or suggested?	5	4	3	2	1	0
8.)	How many of the listed corrections would have prevented this incident?	5	4	3	2	1	0
9.)	How many corrections are permanent in nature?	5	4	3	2	1	0
10.)	In how many of the corrections listed is the supervisor now doing something differently?	5	4	3	2	1	0

Total of Circled Points_____
Multiply x 2_____

Reviewed by _____ Score_____
MANAGER

3.0 INTERPRETATION AND UPDATING

The President of the Construction Owners Association of Alberta shall ensure interpretation and updating this standard.

4.0 APPROVED BY _____

Peter Dunfield
Safety Chairperson
Construction Safety Association of Alberta (COAA)

BEST PRACTICE

Department: **Construction Owners Association of Alberta**

Subject: **Focus Observations**

1.0 PURPOSE

To provide a systematic compliance measurement process for construction health, safety and environmental management systems (refer to figure 1 – *Focus Observation Program – Overview)*.

2.0 SCOPE

This Best Practice provides a generic framework for creation and implementation of a Project Focus Observation Program. This standard identifies responsibilities and activities for job functions that have a role in the implementation and stewardship of the Focus Observation Program. This *Best Practice* also includes flow charts that define the process and Observation Checklists that measure compliance to project HSE requirements for 25 high-risk construction activities.

3.0 GENERAL

The process described herein includes elements of known and effective construction management systems including: physical conditions inspections, behavioral observations, quality surveillance activities, trend identification and analysis and, team problem solving (see figure 2 – Elements of a Construction Focus Observation Program).

Focus Observation is an advanced safety management technique. Companies that have yet to achieve organizational consistency and quality in their core HSE elements (i.e. Internal Responsibility System, Risk Assessment and Treatment, Investigation, etc.) are advised to maintain emphasis on these fundamentals prior to considering implementation of a formalized observation or compliance measurement system.

A focus observation program is not a behavior-based safety observation program. While methodology is similar and the program described herein requires observation of work in-progress, the thrust of a Focus Observation program is to measure *compliance* based on pre-determined standards (usually those detailed in a Project HSE Manual or equivalent). The observation feedback and process improvement loops of a focus observation program differs markedly from behavior-based approaches in that compliance data is used primarily to motivate management and supervision to provide more directed and specific oversight and direction to work processes requiring improvement.

While a focus observation program must include constructive criticism and effective corrective coaching, these interactions are not considered the main driver of improving behaviors at the work face. While peer-to-peer reinforcement of compliant behavior is important, most workers are more strongly motivated by the actions, attitudes and instructions of their supervisor and the remainder of the management team. Hence, the process described here requires organization of technically skilled compliance measurement teams whose primary purpose is to collect compliance data. The data is then analyzed and charted for distribution to the field supervisory and management teams. Also described are formal input processes for the compliance measurement teams to provide line supervision and management with improvement recommendations.

A properly implemented and managed focus observation program provides the construction management team the most effective diagnostic tools for their health, safety and environmental management system.

4.0 RESPONSIBILITIES

The **Construction Manager / Director** is responsible to instruct and empower line managers, field supervision and project HSE resources to implement the Focus Observation Program. This includes providing direction to each of the above individuals and / or teams to provide adequate resources in terms of people availability and funding to effectively carry out the requirements of the program. The Construction Manager / Director is shall identify a *management champion* for the Focus Observation Program.

The **Project HSE Manager** is responsible to:

- Provide instruction to the Project Management and Line Supervision teams regarding the mechanics of the Focus Observation program, including:
    - Selection and formation of compliance measurement teams;
    - Selection of construction activities to be measured;
    - Format and content of compliance checklists;
    - Methods for collection and compilation of compliance data;
    - Distribution and dissemination of data;
    - Feedback mechanisms, work improvement steps and tracking of program implementation.
- Provide data management software to adequately tabulate and chart compliance findings,
- Provide administrative personnel to compile and disseminate compliance data to project management and line supervision;
- Participate in feedback sessions and monitor quality and quantity of same
- Communicate key compliance team findings to project management including discussion of significant successes and areas of opportunity for improvement.
- Monitor implementation and stewardship of the Focus Observation program and offer input to the management champion.

The **Management Champion** shall serve as the focal point for implementation and stewardship of the Focus Observation program and is responsible to:

- Manage and monitor implementation steps;
- Provide feedback to project management, line supervision and involved individuals on a timely basis regarding program progress and effectiveness;
- Solicit help as required to ensure effective implementation and operation of the Focus Observation Program.

General, Area and Discipline Superintendents are responsible to:

- Ensure that individuals with sufficient technical skill, knowledge and experience are identified and made available to serve on compliance measurement teams;
- Actively participate in compliance measurement team feedback sessions;
- Ensure that compliance data is duly reviewed and discussed at team HSE and supervisory planning / update meetings;
- Ensure improvements to work processes based on compliance data and feedback sessions are implemented by line supervision and craft personnel in their area of responsibility.

General Foremen and Craft Foremen are responsible to ensure that trades personnel selected for compliance measurement teams are made available as required to effectively perform their duties.

Compliance Measurement Team Members are responsible to:

- Perform observations in compliance with the established schedule;
- Complete compliance checklists per the program standard and submit for data input in a timely manner
- Formulate compliance improvement proposals for management consideration; and,
- Participate in feedback sessions per the established schedule.

5.0 DEFINITIONS

Compliance Checklist - Typically a one or two page listing of 'line items', including both physical and behavioral requirements, critical to ensuring compliance to a specific project standard. The Compliance Checklist is used by measurement team members to systematically quantify compliance to standard while observing and evaluating work in progress.

Safe Work Practices / Procedures - Usually used as source documents for creating Compliance Checklists. Practices and Procedures that should be considered for inclusion in the focus observation program are those documents that define control measures for those construction activities that present the highest degrees of risk and those with the greatest history of significant losses.

6.0 STANDARD

A focus observation program requires implementation of five specific steps (refer to Figure 3 – *Implementation Steps Flowchart)*:

Step 1 Development of checklists specific to the requirements of the safe work practices and procedures implemented on the project.

Step 2 Establishment of operational parameters for compliance measurement teams

Step 3 Data processing, includes collection / compilation, input and analysis

Step 4 Data distribution and dissemination

Step 5 Development and implementation of corrective actions for work processes requiring improvement and commendation / positive reinforcement of areas where compliance is high

Step 1 Develop compliance measurement checklists

This Best Practice includes sample Compliance Checklists for the following 25 high criticality construction activities (see Appendix 1.1 – 1.25):

- Field level risk assessment
- Cranes and mobile equipment
- Elevated work & material control
- Fall protection
- Housekeeping
- Aerial work platforms
- Open holes and penetrations
- Personal protective equipment
- Power & hand tools
- Respiratory protective equipment
- Pick & carry operations
- Structural steel erection
- Barricades
- Electrical isolations
- Environmental care
- Fuel storage & use
- Job hazard analysis
- Mechanical isolations
- Permit systems
- Pneumatic tools
- Preventive maintenance
- Rigging
- Scaffolding
- Welding, cutting & burning
- Workplace Hazardous Materials Information System

The line items on each checklist reflect representative standards from major construction projects completed in the Province over the 1998 – 2003 period. The reader is specifically cautioned not to use these checklists verbatim and implement them without doing a thorough review of each checklist to ensure consistency with safe work standards on the specific work site.

While the checklists appearing in the appendix of this document are representative of a high qualify safety management system and work standards, they are not immediately transferable to any construction project.

Project management are encouraged to identify other areas of compliance measurement consistent with project needs including accident experience, historical losses, formal inspection findings and investigation lessons learned.

Step 2 Establish operational parameters for compliance measurement teams and conduct compliance measurements

The *Management Champion* shall serve as the facilitator of the identification and selection of craft personnel to serve as compliance team members. Selections must be done with the input and support of general, area and discipline superintendents.

Compliance Team Members may include foremen and general foremen, however senior trades personnel are typically the best choices. Other personnel that may be considered are Joint Worksite Health & Safety Committee members, appropriately knowledgeable client personnel and job stewards.

The qualities of *natural leaders* are of course desired in compliance team members but the primary selection criteria is *technical and operational excellence* within the individual's respective craft.

Determination of compliance measurement cycles. Key questions are:

- How many observers are required to adequately cover the various areas and distinct activities of the project.
- What will the size and composition of the measurement teams be (i.e. individuals, pairs, groups of three or more; two Scaffolders together or one Scaffolder accompanied by a Pipefitter, etc.)
- Budget for observation times - how often will the teams make observations (i.e. each observer x 2 cycles x 15 minutes / shift)

Implementation of compliance observations. Once the above questions have been considered, answered and agreed to by the management and supervisory teams, it is critical that an observation schedule be established for all parties (compliance teams, foremen / general foremen, superintendents, project management) to steward to. Measurement and awareness of compliance team activity is critical to making required corrections as the program matures.

Step 3 Data compilation, input and analysis

The results of that compliance measurement activity are typically expressed in **% *compliance*.** The following formula is used:

$$\frac{\text{Total Practices \& Conditions Observed in Compliance} \times 100}{\text{Total Practices \& Conditions Observed}} = \text{\% Compliance}$$

For example, if the total number of practices and conditions observed in compliance was 17 and the total number of observations made was 22 the calculation of % compliance would be:

17 X 100 = 1700 ÷ 22 = 72.2 i.e. 72 % compliance

Detailed breakdowns of compliance data can be done by several parameters to provide meaningful information to the project. The first level of data analysis is by compliance checklist.
Other compilation and analysis areas can include:

- By project area
- By day of the week or hour of the days
- By Day shift versus night shift
- By temperature or climatic conditions
- By activity or craft
- By superintendent

It is strongly recommended that computer software be used to compile and process the data collected on the compliance checklists. MS-Excel can be used effectively to compile information and chart compliance results. Several commercial observation-tracking programs are available including:

- ProAct (www.safetyadvantage.com/bbs)
- BAPPTrack (www.bstsolutions.com), and
- Radar 3.0 (safetyperformance.com)

It is recommended that completed compliance checklists be input to the software program by a single, dedicated, administrative resource.

Step 4 Data distribution and dissemination

The Management Champion, with input from project health, safety and environmental professionals, is responsible to compile reports showing compliance data and distribute the information to the various project stakeholders. The degree of data analysis and distribution of reports is solely dependent on the specifics of the project.

Refer to Appendix 4.1 – 4.3 for examples of compliance reports that can be generated. Please note that in many cases, comments are provided that emphasize specific items of interest. The Management Champion or a senior HSE professional are typically the best resources for this type of analysis and comment.

Compliance data can be distributed, posted and discussed at any or all of the following:

- Craft safety meetings
- Pre job talks
- Project orientation
- Joint worksite Health & Safety committee meetings
- Job stewards meetings
- Included in project newsletters
- Posted on project bulletin boards

Step 5 Development and implementation of corrective actions and commendations

The true benefit of a Focus Observation program is having the ability to make reasoned and effective management decisions based on meaningful and validated compliance data. It is important to identify areas for correction as well as areas for commendation. There are several information sharing and improvement mechanisms that can be considered for implementation:

- Actions / solutions prescribed by Project Management. The Management Champion and / or the senior project HSE professional can bring compliance reports forward to the construction manager and senior superintendents, on a periodic basis, for discussion and determination of action plans. This is an effective means of ensuring senior line managers stay engaged in the program, see the benefits of the effort and lead the improvement activities in the field.
- Review meeting with compliance teams and senior supervision. Team problem solving sessions that include area superintendents, general foremen and compliance team members are effective in giving the line supervisory teams ownership of the focus observation process and control of improvement activities in the field.
- Canvassing the foreman and general foreman to provide improvement strategies for areas of low compliance based on input from craft personnel and, individuals, crews, teams or crafts that should be recognized for excellent performance.
- Canvassing JWH&S Committee members and job stewards for improvement opportunities.

7.0 IMPLEMENTATION

The Construction Manager is responsible for the effective implementation and stewardship of the project Focus Observation program.

8.0 INTERPRETATION AND UPDATING

The chairman of the COAA *Leading Indicator's Best Practices Sub-Committee* is responsible for the interpretation and periodic updating of this standard.

9.0 APPROVED BY

Peter Dunfield, Chairman
Construction Owner's Association of Alberta Safety Committee

FOCUS OBSERVATION PROGRAM

A structured and statistically-valid approach to measuring compliance to your HSE Management System

STEP 1 — **Develop compliance checklists specific to the requirements of the safe work practices and procedures within the HSE Management System (Project HSE Manual)**

Barricades	Field Level Risk Assessment	Cranes and Equipment	Electrical Isolations	Elevated Work & Material Control
Environmental Care	Fall Protection	Fuel Storage & Use	Housekeeping	Job Hazard Analysis
Aerial Work Platforms	Mechanical Isolations	Open Holes	Permit Systems	Personal Protective Equipment
Pneumatic Equipment	Power & Hand Tools	Preventative Maintenance	Respiratory Protective Equipment	Rigging
Pick & Carry Operations	Scaffolding	Structural Steel	Welding, Cutting & Burining	WHMIS

STEP 2 — **A) Select compliance measurement teams B) Establish observation cycle and other terms of reference C) Conduct observations**

Senior Trades Personnel	H&S Committee Members	Job Stewards	Craft Foremen	Others

2 x 15 minutes / day / observer

Specify checklists to be used by whom, when and where

STEP 3 — **A) Compile data / enter to database B) Compile reports for: senior management, supervision and craft C) Analyze data to identify high and low compliance areas / activities**

$$\frac{\text{Total Behaviours / Conditions Observed in Compliance} \times 100}{\text{Total Behaviours / Conditions Observed}} = \%\ \text{Compliance}$$

By checklist	By area	By time period	By observer team

STEP 4 — **Communicate compliance data to management, supervision and craft**

STEP 5 — **A) Develop action plan for categories of low compliance**
B) Develop commendation actions for categories of high compliance

Review Meeting with Compliance Teams and Field Supervision	Actions / Solutions prescribed by Senior Management	Correlation with Inspection data

HSE Management System Refinement and Improved Compliance

Figure 1

ELEMENTS OF A FOCUS OBSERVATION PROGRAM

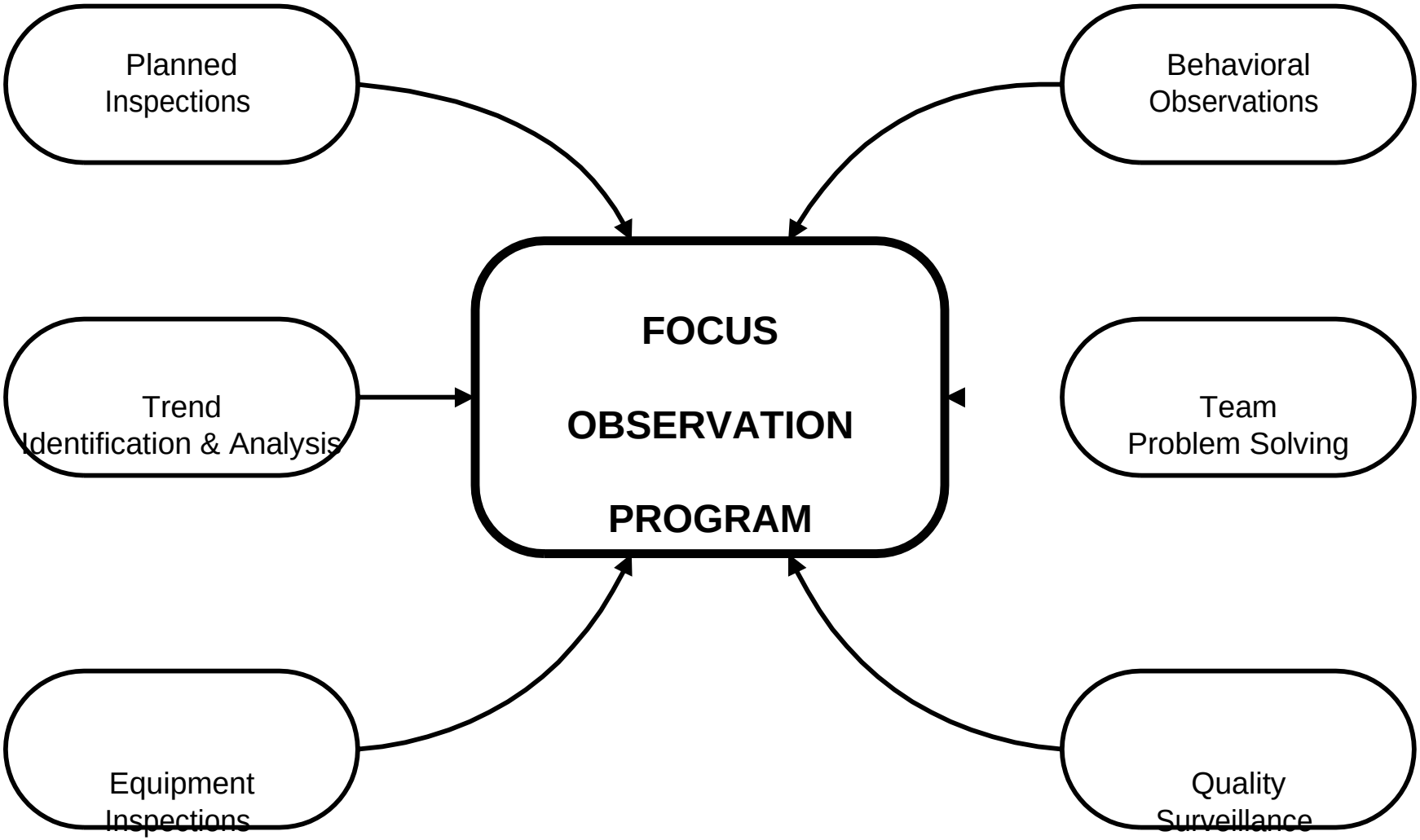


Figure 2

FOCUS OBSERVATION PROGRAM

IMPLEMENTATION STEPS

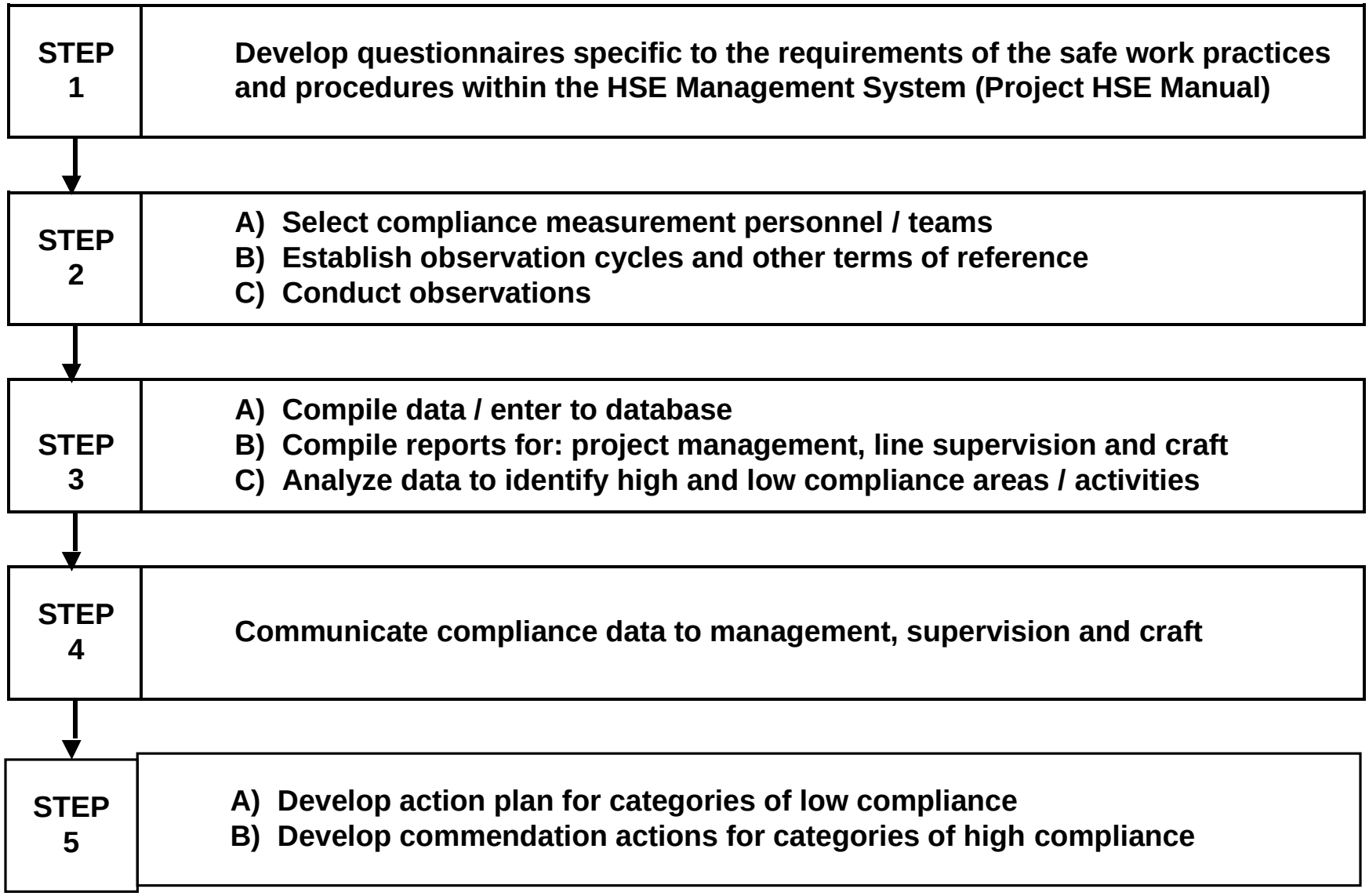
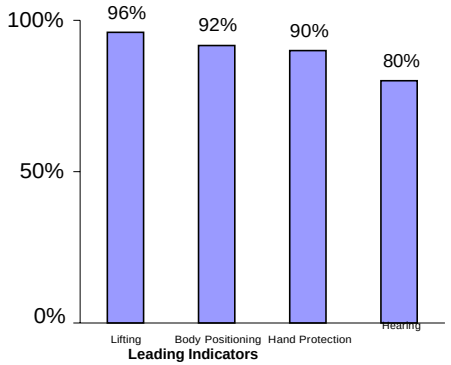


Figure 3

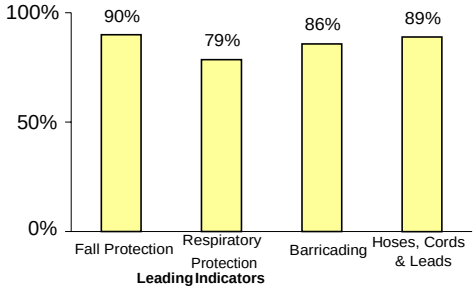
Observation Data Executive Summary
Week ending March 22, 2002

Area 1



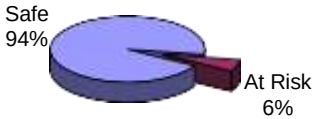
Total number of Individuals Observed: 10

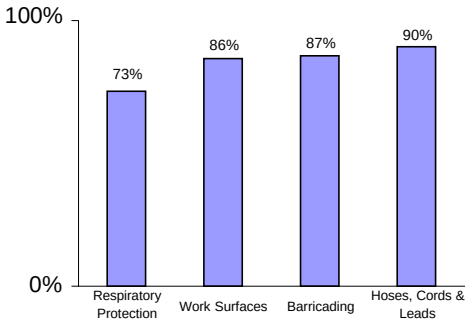
Site Wide



Total number of Individuals Observed: 491

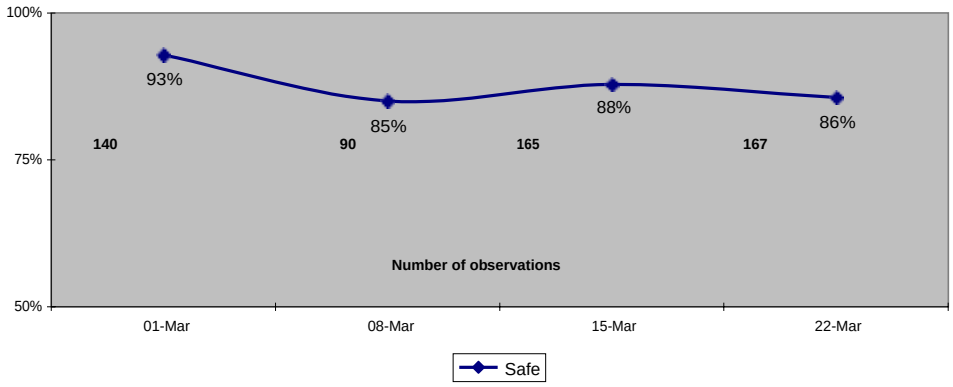
Area 2



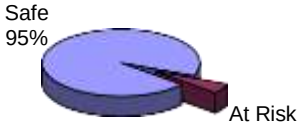


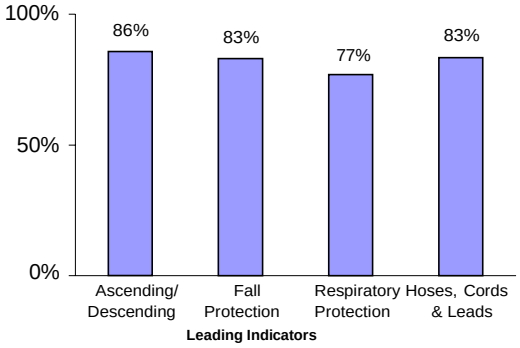
Total number of Individuals Observed: 240

Site Wide 4 Week Trend
Barricading



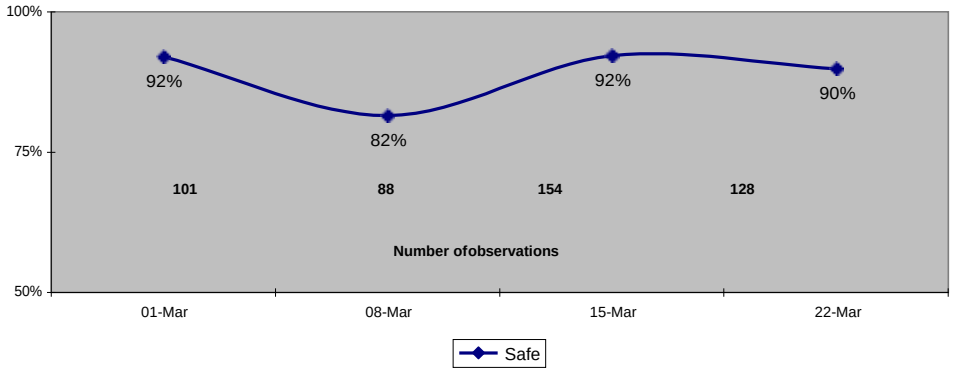
Area 3





Total number of Individuals Observed: 99

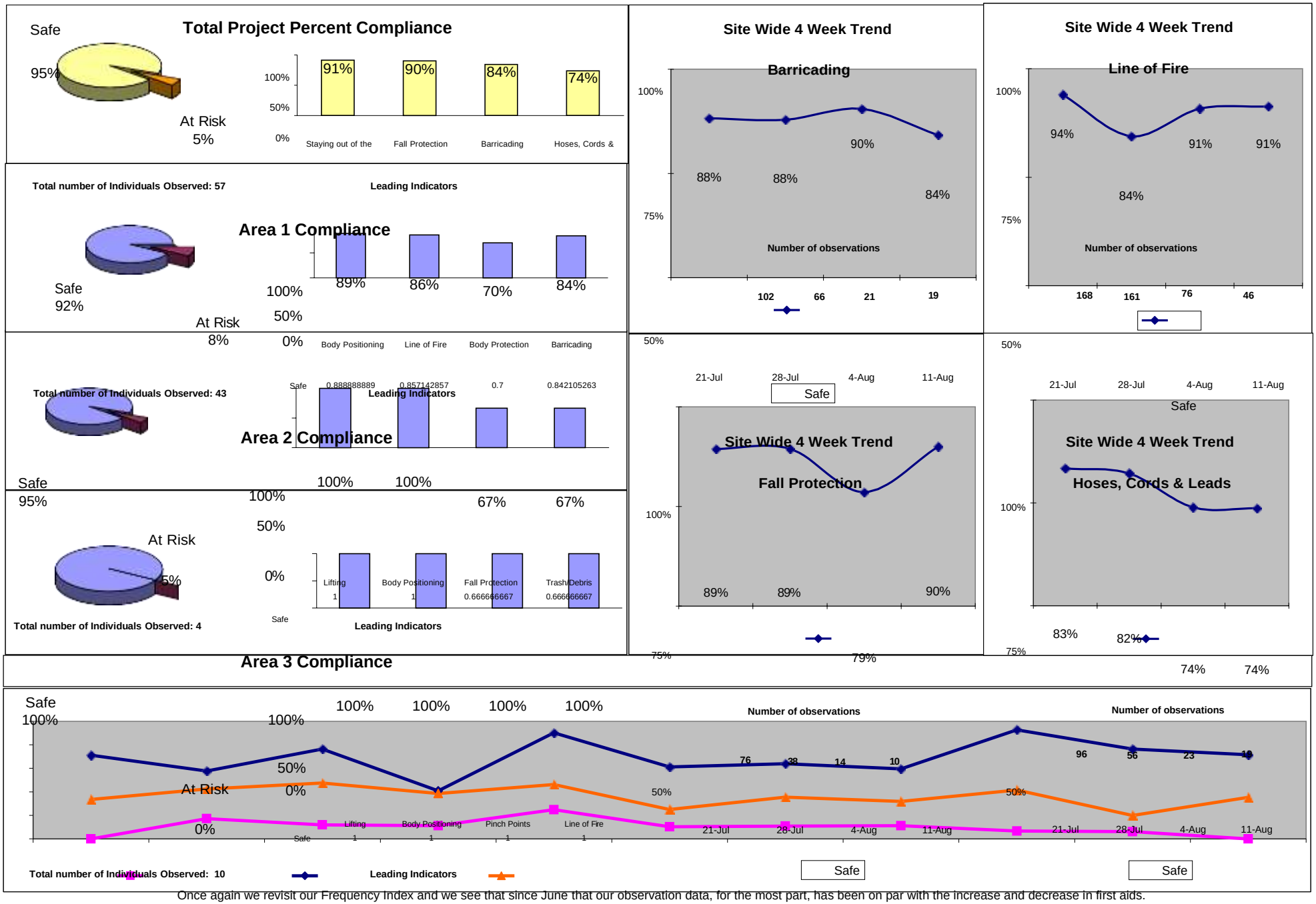
Site Wide 4 Week Trend
Fall Protection



Observation Data Executive Summary

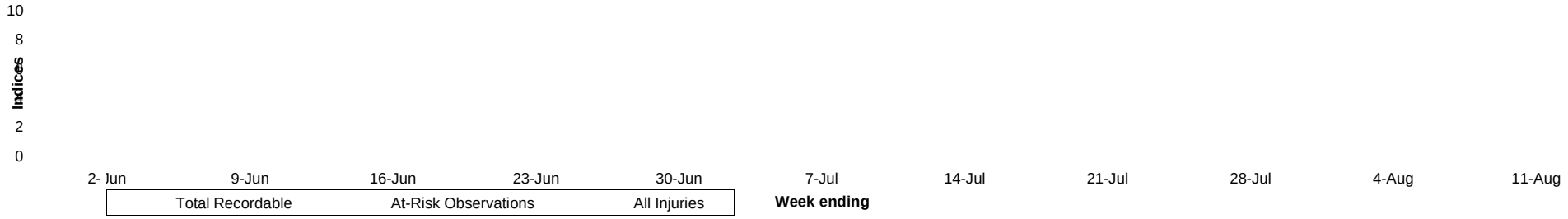
Week ending August 11, 2002

Figure 4.2



Once again we revisit our Frequency Index and we see that since June that our observation data, for the most part, has been on par with the increase and decrease in first aids.
There are only two deviations, the first week and the last week. Therefore since July we can say that based on a weekly trend our observation data correlates to our accident experience 80% of the time.

Injury vs At-Risk Observation Frequency Index


10
8
6
4
2
0
Indices
2- Jun
9-Jun
16-Jun
23-Jun
30-Jun
7-Jul
14-Jul
21-Jul
28-Jul
4-Aug
11-Aug
Total Recordable
At-Risk Observations
All Injuries
Week ending

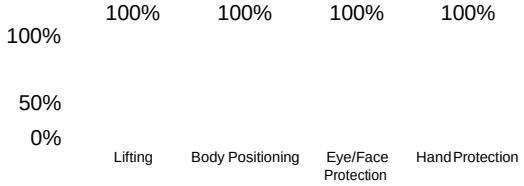
Focus Observation Program - Executive Summary
Week ending May 26, 200

Figure 4.3

Area 1

Safe 99%

At Risk 1%



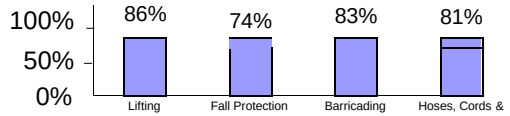
Total number of Individuals Observed: 12

Leading Indicators

Area 2

Safe 92%

At Risk 8%



Total number of Individuals Observed: 115

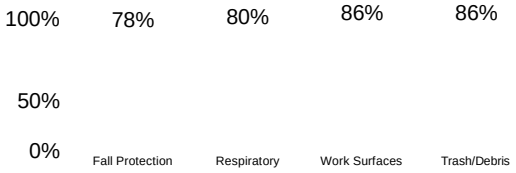
	Lifting	Fall Protection	Barricading	Hoses, Cords &
Safe	0.857142857	0.742857143	0.825	0.8125

Leading Indicators

Area 3

Safe 91%

At Risk 9%



Total number of Individuals Observed: 24

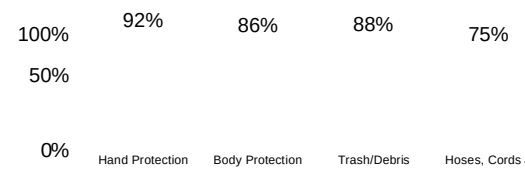
	Fall Protection	Respiratory	Work Surfaces	Trash/Debris
Safe	0.777777778	0.8	0.863636364	0.857142857

Leading Indicators

Area 4

Safe 97%

At Risk 3%



Total number of Individuals Observed: 22

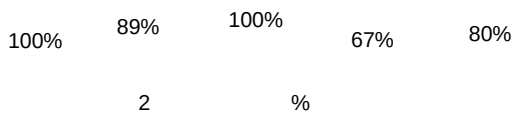
	Hand Protection	Body Protection	Trash/Debris	Hoses, Cords &
Safe	0.923076923	0.857142857	0.875	0.75

Leading Indicators

Area 5

Safe 98%

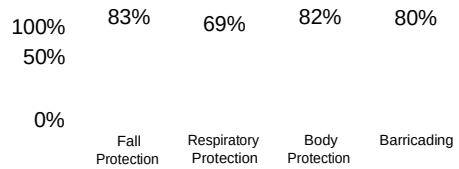
At Risk 2%



Total Project Percent Complaince

Safe 94%

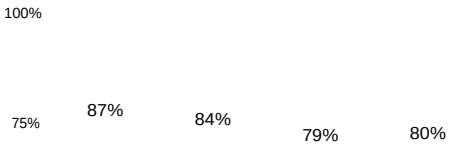
At Risk 6%



Total number of Individuals Observed: 201

Leading Indicators

Site Wide 4 Week Trend
Barricading

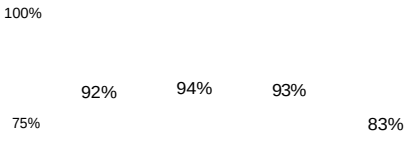


Number of observations

5-May	1-May	1-May	1-May
156	174	61	75

Safe

Site Wide 4 Week Trend
Fall Protection

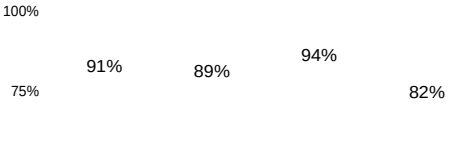


Number of observations

5-May	1-May	1-May	1-May
116	134	46	64

Safe

Site Wide 4 Week Trend
Body Protection

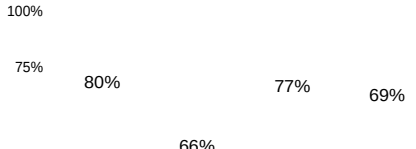


Number of observations

5-May	1-May	1-May	1-May
161	185	69	57

Safe

Site Wide 4 Week Trend
Respiratory Protection



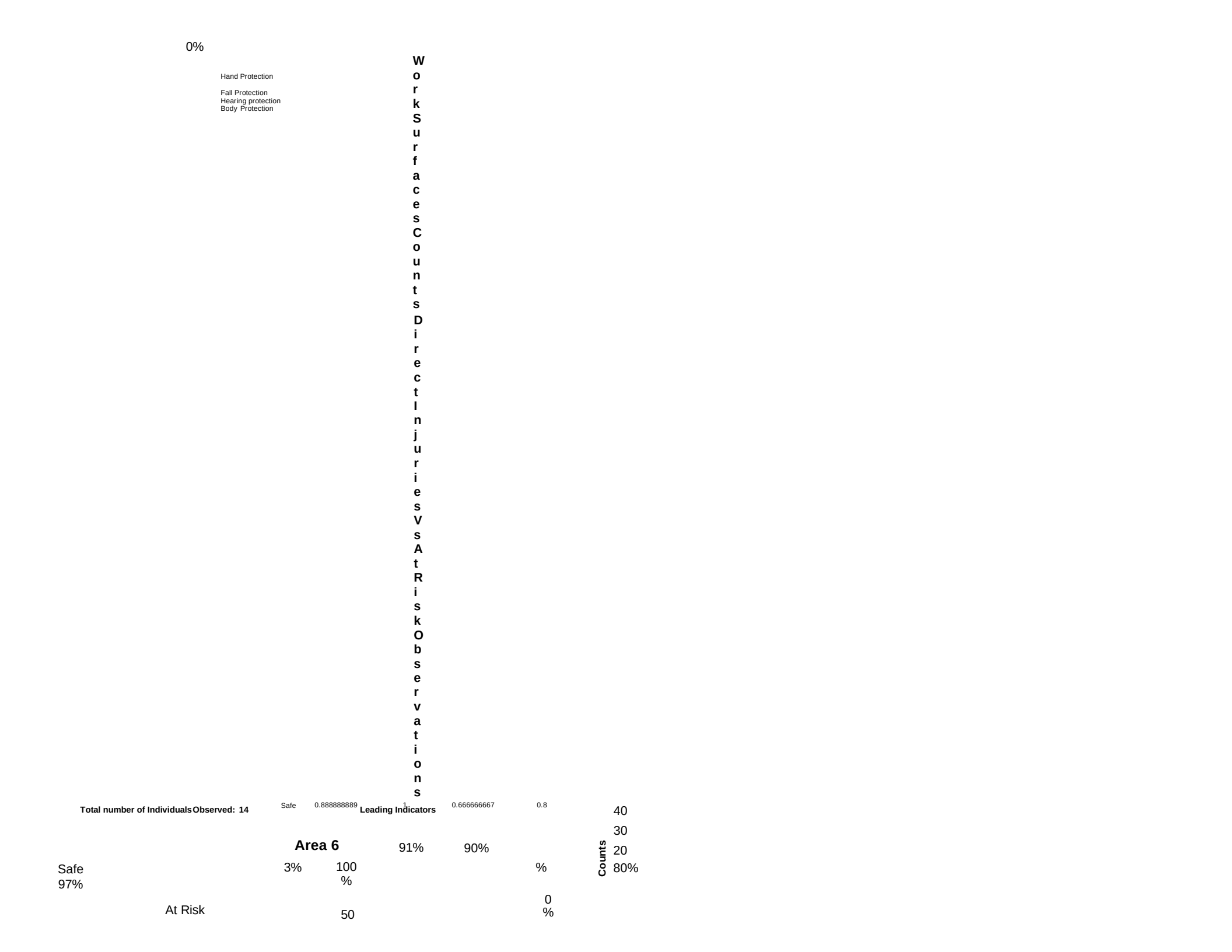
Number of observations

5-May	1-May	1-May	1-May
64	47	22	26

Safe

The following shows the correlation between "At Risk Observations" and "Direct Injuries" resulting from unsafe Work Surfaces.

50%


0%
Hand Protection
Fall Protection
Hearing protection
Body Protection
Work Surfaces Counts Direct Injuries Vs At Risk Observations
Total number of Individuals Observed: 14
Safe
0.888888889
Leading Indicators
1
0.666666667
0.8
40
30
20
Counts
Area 6
91%
90%
Safe
97%
3%
100%
%
80%
At Risk
50
0%

82%

10

0

3
7
3
5
9

3
7
3
6
6

3
7

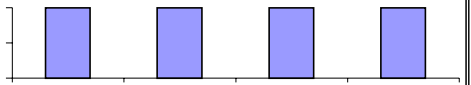
3
7
3

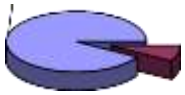
3
7
3
8
0

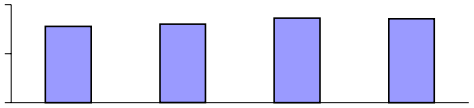
3
7
3
8
7

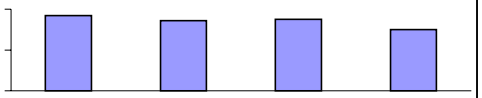
3
7
3
9
4

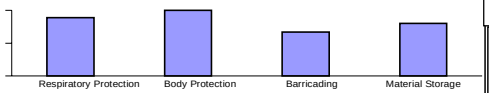
3
7
4
0
1





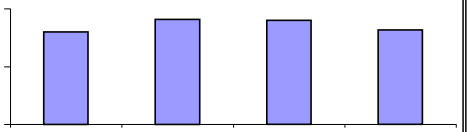


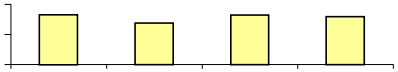


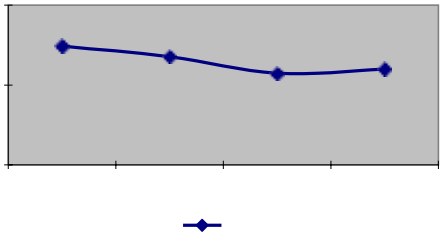


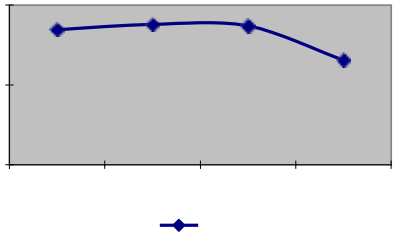
Total number of Individuals Observed: 14

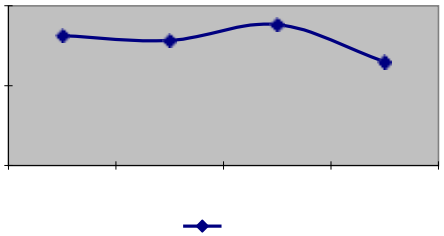
Leading Indicators

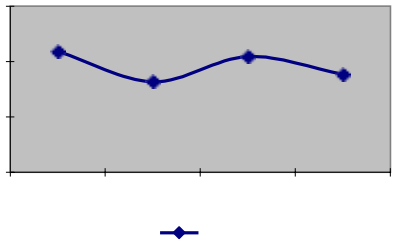


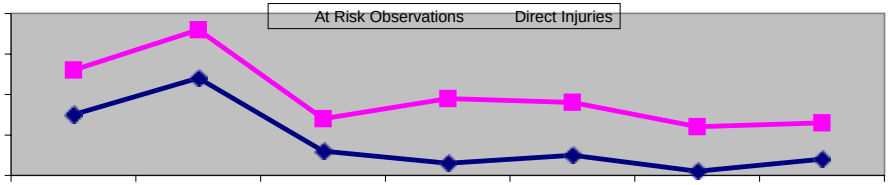












Appendix 1.1

Barricades Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Flagging				
• Radiation (with signage)				
• Red Vs. Yellow				
• Tag @ access(s)				
• Signed				
• Proper information on tag				
• 4- sided				
Signage				
• Warning of hazard				
• Placed in a visible location				
• Removed after hazard is cleared				
Physical Barriers				
• Scaffolding				
• Fencing				
• Ropes				
Sub-Totals				% Compliance = (In Compliance X 100) / Total **Imminent Danger = -20% off total score**
Total Values (Combined)				**% Compliance This Week:**_____

Appendix 1.2

Field Level Risk Assessment Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non Compliance	Imminent Danger	Comments
Field Level Risk Assessment			**-20% Each**	
• Safety Topic available and reviewed				
• Previous concerns addressed by supervision				
• Answers to concerns reviewed with crew				
• Pre shift Planning Completed				
• Crew fit for duty? (PPE requirements met)				
• Procedures and permits in place				
• Material storage and housekeeping addressed				
• Behavioral concerns addressed				
• Tool and equipment inspections completed				
• Fall protection addressed				
• Modified work managed (as required)				
• Work plans completed in detail				
• Previous Shift Review completed & addressed				
• Signed by all crew members and supervision				
Comments:				

Sub-Totals				**Imminent Danger = -20% off total score**
Total Values (Combined)				% Compliance = (In Compliance X 100) / Total **% Compliance This Week**:_____

Appendix 1.3

Cranes and Equipment Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• Safe distance to struct/equip				
• Designated signal person w/ gauntlet				
• Signaling/communications				
• Visibility/lighting				
• Ground conditions				
• Anti two block device				
• Outrigger pads				
• Swing hazard area flagged				
• LMI functioning (18 ton or >)				
Load Control				
• Knows weight/angle/radius				
• 100% control of load				
• Warns personnel of lift				
• Tag lines used				
• No horizontal pull on boom				
• Daily log book completed				
Other				
• Lift calculation form				
• Rigging data sheet				
• Rigging plot plan				
• Back up alarms functioning				
Sub-Totals				**Imminent Danger = -20% off total score** %comp = (In Comp X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.4

Electrical Isolations Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• Elect. Supervisor approved				
• Scissor device applied				
• Craft locks applied (red, #)				
• Fuses / breakers removed				
• Lock out tag present				
• Signed, dated ,brass #				
• Recorded in the log				
• Local starts tried				
Sub-Totals				% Compliance = (In Compliance X 100) / Total **Imminent Danger = -20% off total score**
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.5

Elevated Work & Material Control Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	C	NC	ID	Comments	Supervisor / Trade / Position
Tool and Material Storage					
• Check flanges, ledges, pipe ends and scaffold tube ends for improperly stored items					
• Tool boxes, canvas bags or pails used to store tools/materials					
• Material blocked or tied off and Secured against high winds					
• Decks and walkways clear of:					
⇒ Cut grating pieces					
⇒ Stray tools					
⇒ Misc. items If it does not belong, then it's out of place!					
Material Handling					
• Materials hoisted by gin wheels or hand lines tied properly					
• Material passed safely					
⇒ Hand to hand contact					
⇒ Passed without overreaching					
Tool Handling					
• Plywood or fire blankets used on grating					
• Tools put in pouches when not in use					
• Containment set up for work performed outside structure or handrail					
• Work contained within basket (AWP) or with material					
Sub-Totals				Formula: % Compliance = (In Compliance X 100) / Total	**Note:** Imminent Danger = -20% off total s**core**

Total Values (Combined)	**% Compliance This Week:**

Appendix 1.6

Environmental Care Focus Observation

Observer:_____ **Date of Observation:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Observed	Compliance	Non-compliance	Comments
Non-Hazardous Waste			
• Contamination in non-haz. waste bins			
• Non-haz. waste bins labelled			
• Waste drums labelled in area			
• Aerosol can drum at tool crib			
Hazardous Waste			
• GF/F aware of haz. waste mgmt. procedure			
• Haz. waste segregated from non-haz. waste			
Spill Prevention and Containment			
• Spill pans in place			
• Spill pans suitable size			
• Spill kits on equipment			
• Workers know to report spills			
• Spill response supplies in area			
Hydrotesting			
• Collection of water/glycol leaks during hydrotesting			
• Drip pans at connection points			
Sub-Totals			% Compliance = (Total Observations In Compliance X 100) / Total Observations Observed
Total Values (Combined)			**% Compliance This Week**:_____

GENERAL NOTES FOR ENVIRONMENT FOCUS OBSERVATION

Non-Hazardous Waste

- Contamination in non-haz. waste bins – look for materials in BFI bins that do not belong (general refuse in scrap metal bin).
- Non-haz. waste bins labelled – BFI bins should be labelled with the waste to be deposited in that bin (Scrap Metal, Wood Waste, etc.). Exempt are all general refuse and 6 cubic yard front load bins.
- Waste drums labelled in area – waste drums in the units should be labelled 'GARBAGE' or 'GENERAL REFUSE'
- Aerosol can drum at tool crib – each tool crib should have a designated aerosol can disposal drum.

Hazardous Waste

- GF/F aware of haz. waste mgmt. procedure – should be aware of procedure to contain, label and remove haz. waste or potentially haz. waste from the unit. Distributed as site Env. Bulletin # 10.
- Haz. waste segregated from non-haz. waste – Ensure any hazardous waste generated is not disposed in non-hazardous waste bins or drums. Typical hazardous waste – solvents, component parts of epoxies, used oil, non-empty containers of paint, adhesives, coatings, etc.

Spill Prevention and Containment

- Spill pans in place – spill pans are to be provided below all portable equipment such as welding units, gen-sets, heaters, etc. Not required on paved areas.
- Spill pans suitable size – spill pans shall be of sufficient size to contain at least the area of the engine oil pan and fuel storage tank.
- Spill kits on equipment – all larger mobile equipment shall be equipped with a spill kit or at minimum spill response supplies such as absorbent pads.
- Workers know to report spills – verifythat workers know to report all spills to F/GF.
- Spill response supplies in area – spill response supplies such as absorbent pads, booms ,etc. shall be available within the unit – at the tool crib; in drums located around unit.

Hydrotesting

- Collection of water/glycol leaks during hydrotesting – drums and spill pans should be in place to collect water/glycol released from vent drains and drip legs during hydrotesting.
- Drip pans at connection points – spill pans shall be provided at all connection points during loading and unloading of glycol/glycol-water mix from the hydrotest system.

Appendix 1.7

Fall Protection Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General/Personal				
• Harness fit training sticker				
• Used at 6' and above				
• Harness adjusted properly				
• Lanyards stored properly				
• 100% tie-off maintained				
• Tie off above D ring				
• Anchor slings used properly				
• Anchor points (5000#)				
Inspection				
• Free of defects/damage				
• Not modified				
• Current colour coding				
Horizontal Life Lines				
• Nothing hanging on line				
• 2 Workers max/line				
• Tags in place and current				
• No stepping on lines				
Storage				
• Stored free from hazard				
Sub-Totals				% Compliance = (In Compliance X 100) / Total **Imminent Danger = -20% off total score**

Total Values (Combined)			**% Compliance This Week:**_____

Appendix 1.8

Fuel Storage and Use Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• Storage areas identified				
• Tanks physically protected				
• Storage tanks bermed				
• Tanks > 20’ from buildings				
• 20 lb ext. near storage area				
• Labeled - No Smoking				
• Products identified				
• Areas clear of combustibles • <60 gal. flam, <120 gal. comb • Safety fuel cans used				
• Refueling - Equipment off				
• Environmental spill kit				
Pressurized Cylinders				
• 20’ separation or firewall between O2 and fuels				
• Cylinders returned to storage area when not in use				
• Certified lifting device used				
• Flashbacks in place				
• Regulators removed after use				
• Stored upright and capped				
Sub-Totals				% Compliance = (In Compliance X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.9

Housekeeping Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Material Storage				
• Clear of walkways/work areas				
• Parallel & 90 walls/curbs				
• Stacked/stored safely				
Cords and Cables				
• Elevated				
• No trip hazard				
• Marked / flagged				
Work Areas				
• Neat and organized				
• No slip/trip hazards				
Waste Handling				
• Containers available/accessible				
• Containers not full				
Scrap materials				
• Areas clear of scrap • (Non-compliance explain below)				
• Identifiable by trade				
• Type of scrap				
• Location of scrap				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.10

Job Hazard Analysis – FLRA Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Comments
Job Hazard Analysis			
• Supt. signs JHA			
• Supervisor facilitates			
• One craft represented during development			
• All craft have signed JHA			
• Created for high risk work			
• Created for new tasks			
• Created for major work			
• Historical hazardous work			
• Hazardous waste work			
FLRA			
• Performed each morning			
• Performed for task change			
• FLRA signed by craft			
• Supervisor checks quality of FLRA periodically			
• Supervisor randomly participates in FLRA			
• FLRA addresses hazards			
• FLRA is developed for necessary tasks at hand			
Sub-Totals			% Compliance = (Total Observations In Compliance X 100) / Total Observations Observed

Total Values (Combined)		**% Compliance This Week**:_____

Appendix 1.11

Aerial Work Platform Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Operator				
• Certified onsite or equivalent training				
• Proper PPE, harness and attachment point				
Pre- use Inspection				
• Site mech. sticker displayed				
• log book maintained				
• Operator Pre-use inspection completed				
Safe Operation				
• Fire extinguisher present				
• Air horn / Emerg. Whistle				
• Area flagged off				
• Controlled operation				
• On level ground				
• Spotter in congested areas				
• Not used as a hoist				
• No overhanging materials				
• Within the safe capacity				
• Visibility in the basket is not obstructed				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Comp X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.12

Mechanical Isolations Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• Blinds rated for hydro-test				
• Tagged and numbered				
• Valves are isolated, locked and recorded				
• Isolation is 100% complete				
• Recorded in the blind log				
• Blinds signed off in blind log prior to removal				
• Blind log updated prior to installation of spools				
• CSE permit signed by authorized blind log personnel				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.13

Dangerous Holes and Openings Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Barricade				
• Physical barricade				
• Hazard signage				
• Tag @ access(s)				
• Signed & dated				
• Proper information on tag				
• Tags on 4- sides				
Hole covers				
• Rated to support 2.4 kilonewtons/m^2 (45lbs/ft^2)				
• Secured				
• Visibly marked				
General				
• Fall arrest used inside barricade				
• JHA completed				
• Permit completed and posted at location				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.14

Permit Systems Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Excavation / Chainsaw / Road Closure (Confined Space / Manbasket / Hot Work)				
• JHA Present and signed				
• Permit is posted				
• Signed				
• Permit requirements met				
• Hazards identified				
• Working with in the scope				
• Dated for current shift				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.15

Personal Protective Equipment Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General Requirements				
• Long sleeve shirt				
• Gloves				
• CSA approved 6" boots				
• CSA hard hat				
• CSA glasses with S.S.				
• Combo. hardhat/exemption				
Eye Protection				
• Mono goggles				
• Face shield w/ cowling				
• Welding shield				
• Cutting glasses				
Hearing Protection				
• Ear plugs				
• Ear muffs				
• Combination				
Chemical Hazards (MSDS Recommended Controls)				
• Respiratory PPE				
• Outer clothing				
• Gloves (special purpose)				
• Boots				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.16

Pneumatic Tool Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• Proper tool for the job				
• UL or CSA approved				
• Anti vibration grips				
• Proper attachments for tool				
• Side Handle used				
• Disconnect when adjusted				
• Air compressor has containment under				
• Air compressor in ventilated space				
• Couplings secured (pins and/or whip checks)				
• Proper guards installed				
PPE				
• Hearing protection				
• Mono goggles/face shield				
• Metatarsal/Instep guards				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.17

Power & Hand Tool Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General – Power Tools				
• UL or CSA approved				
• Proper attachments for tool				
• Side handle used				
• Disconnect when adjusted				
• Foot pedal installed				
• Trigger locks removed				
• Proper guards installed				
General – Hand Tools				
• Tie backs (drop hazard)				
• Carried in pouch				
• Handle in good repair				
• Handles on file				
• Ladders (C.C.)				
• No snipes				
Knives/Cutting tools				
• No Razor knives				
• Striking tool dressed				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.18

Preventative Maintenance Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Comments
Colour Coded Items			
• Fall Arrest Equipment			
• Slings			
• Hooks			
• Shackles			
• Come-a-longs			
• Tirfors			
• Chainfalls			
• Welding Leads			
• Electrical cords			
• Electrical Tools			
• Ground Fault Interrupters			
• Portable Ladders			
Colour Code Information			
• Red Tool Tags Available			
• Current Colour Code Posted at Tool Crib			
• Workers Know Current Colour Code			
Sub-Totals			% Compliance = (Total Observations In Compliance X 100) / Total Observations Observed

Total Values (Combined)		**% Compliance This Week**:_____

Respiratory Protective Equipment Focus Observation

Appendix 1.19

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• MSDS available				
• Clean shaven				
• Proper filter/equipment				
• Cartridge clean				
• Used when needed				
• Limitations understood				
• Properly cleaned				
• Proper storage				
Fit Testing				
• Worker fit tested				
• Medical review on file				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.20

Rigging Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
• Free from damage				
• Certs., tags, & rating visible				
• Colour coding current				
• Shackle Pin match sling eye				
• Shackle used for >2 slings				
• Shackle pin secure (as req.)				
• Softeners used				
• No trip haz. from softeners				
• Correct orient. on clamps				
• Wraps and rating on lashing				
• Proper angles maintained				
• Safety latch not by passed				
• 5:1 safety factor maintained				
• No wraps on chain				
• Hooks not cross loaded				
• No loads on suspend loads				
• $<45^0$ angle on beam clamps				
• Force not along length of beam				
• Safety sling used with hoists in crane rigged loads				
• Area secured prior to lift				
• Adequate anchor point				
Sub-Totals				Imminent Danger = -20% off total score % Compliance = (In Compliance X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.21

Pick & Carry Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Items to be Inspected	Compliance	Non-compliance	Comments
General			
• Current FLRA card with crew			
• FLRA card signed by all personnel involved with carry			
• Designated signal person			
• Signaling/communications clear between OE and signal person			
• Visibility/lighting adequate			
• Ground conditions acceptable			
• Load carried in front quadrant			
• **Total** travel distance 100' or less			
• Load tied back to machine			
• Tag lines used to control swing			
• Workers in area notified of machine movement			
• Adequate spotters used as load is moved			
• Load complies with on rubber chart			
Sub-Totals			% Compliance = (Total Observations In Compliance X 100) / Total Observations Observed
Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.22

Scaffolding Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Tags				
• Proper tag & information				
• Inspected weekly				
• Tag @ access(s)				
• Info on Tag reviewed				
Ladders & backcages				
• 6" on back of ladder				
• Rung spacing from grade				
• 30" spacing on backcage				
• Backcage 8' from grade				
• Rest platform every 20'				
• Ladders 3' above platform				
Structure				
• Adequate bay bracing				
• Check clamps in place				
• Tied horizontal & vertical				
Work platform				
• 100% tie off while building				
• Toeboards & handrails				
• ¾ plywood for deck fill				
• Scaffold planks with 6" overhang and cleated				
Sub-Totals				**Imminent Danger = -20% off total score**% Compliance = (In Comp X 100) / Total

Total Values (Combined)			**% Compliance This Week:**_____

Appendix 1.23

Structural Steel Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
General				
• JHA completed				
• MLR used correctly				
• Softeners used				
• Tag lines used				
• Area flagged				
• Hazard signage				
• Proper access/egress				
• Open holes barricaded				
• Canvas bags used				
• Retaining devices used on impacts				
Fall Arrest				
• 100% tie-off maintained				
• Anchor points (5000 lbs. or Engineered devices)				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week**:_____

Appendix 1.24

Welding, Cutting & Burning Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Site Evaluation/General				
• No combustible materials				
• Fire protection (20lb. ABC)				
• Welding screens used				
• Ventilation adequate				
• Spark containment				
• Cylinders stored safely				
Equipment/Cables				
• Cables marked with operator tag				
• Grounded near weld				
• Placed in safe manner				
• Flame arrestors				
• Gauges/regulators (off w/o use)				
• Hose Condition				
• Torch condition				
PPE				
• Leather clothing worn				
• Glasses worn under hood				
• Combination worn **or** overhead deck **or** Exemption Form				
• Cutting glasses				
• Respiratory Protection				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Comp X 100) / Total

Total Values (Combined)			**% Compliance This Week**:_____

Appendix 1.25

WHMIS Focus Observation

Observer:_____ **Date of Inspection:**_____ **Area:**_____ **Craft:**_____

Foreman:_____ **GF:**_____ **Superintendent:**_____

Items to be Inspected	Compliance	Non-compliance	Imminent Danger	Comments
Labeling				
• Label legible				
• MSDS referenced				
• Product name identified				
Material Safety Data Sheets				
• Current				
• Available				
Training				
• Worker is trained				
• Worker reviewed MSDS				
• Worker knows location of MSDS				
PPE				
• Proper PPE as per the MSDS used by the worker				
Documentation				
• All products onsite have MSDS on file				
Sub-Totals				**Imminent Danger = -20% off total score** % Compliance = (In Compliance X 100) / Total
Total Values (Combined)				**% Compliance This Week:**_____

DEPARTMENT: **Construction Owners Association of Alberta**

SUBJECT: **Implementation of a Hazard Identification/Analysis Prior to the Start of a Project - Leading Indicator - Best Practice**

1. PURPOSE

To communicate to COAA members a best practice for the implementation of a Hazard Identification / Analysis process prior to the start of an industrial construction project.

1.1 SCOPE

Leading Indicator

The completion of a Hazard Identification / Analysis process prior to the start of a construction project on industrial construction sites is identified as one of the top ten (10) Leading Indicators developed through the Construction Owner's Association of Alberta.

Leading indicators/activities are pro-active measurements associated with environmental, health and safety management system activities that are identifiable and are regarded as "best in class" performance measurements of construction environmental, health and safety management systems.

Traditional EHS measured indicators are lagging indicators reflecting the past performance of a project. The COAA top ten leading indicators are measurable activities that reflect positively on construction project EHS performance.

Increase Knowledge of the Hazard Identification / Analysis process

Each COAA member has its own hazard analysis techniques and risk matrix. It is not the intention of this best practice to provide a specific, or a trademark hazard identification / analysis program. It is assumed that the hazard identification / analysis processes utilized by COAA members have the same general result of identifying and controlling hazards.

In addition it is not the intention of this best practice to suggest a risk level matrix. Each COAA member needs to determine a risk matrix based on the member's own acceptability of risk.

The project Hazard Identification / Analysis processes continually evolves from the conception of the project and engineering phase, through construction, the commissioning of the unit, and the operating and maintaining of the unit.

Owners tend to concentrate on operate maintain aspects of the hazard assessment process. These types of hazard identification / analysis processes include but are not limited to:

- FEMA – Failure Modes and Effects Analysis
- LOPA – Layer of Protection Analysis
- PSM – Process Safety Management Analysis
- SIL – Safety Integrity Level Analysis
- HazOps – Hazard and Operability Analysis
- EIA – Environmental Impact Assessment

“Hands On” Contractors concentrate on the construction aspects of the hazard assessment process. These types of hazard identification / Analysis processes include but are not limited to:

- JHA – Job Hazard Analysis (task specific)
- Permits – Operations specific task requirements
- FLHA – Field Level Hazard Analysis – task assigned workers conducting a formalized task location assessment prior to starting work or after conditional change in the site environment.

Typically, a disconnect exists between the owner hazard identification / analysis process and the contractor’s process. The intention of this best practice is to provide a tool that compliments both processes to increase the performance of the hazard identification / analysis process to lower the likelihood of incidents occurring.

Hazard Identification / Analysis Template

This best practice includes a straw model Hazard Identification / analysis process that provides a generalized template to be implemented prior to the “pre-mobilization” phase of a project.

Hazard identification / Analysis process

The hazard assessment process spans the life span of the project from the project Scoping phase to the completion and turnover of the project to the client. This best practice generates a flow chart to provide a visual checklist, and to demonstrate the need to integrate the pre-award Hazard Identification / Analysis process with other Environment, Health, and Safety (EHS) management systems (Site Specific EHS Plans), and typical Hazard Analysis systems (FEMA. LOPA, SIL, PSM, two week look ahead EHS integration assessments, JHA’s, HazOps, Permits, and Field Level Hazard Assessment). The flowchart models the utilization of the Hazard Identification / Analysis Process with other EHS Management systems.

Correlation between reducing incidents by utilizing leading indicators.

The COAA best practices subcommittee has developed a list of 300 best practices that are considered leading indicators for the EHS performance of a project. The top ten leading indicators have the greatest impact on reducing incidents. Ultimately, the intent of this best practice is to provide a tool that reduces incidents on industrial construction work sites. It is to be applied appropriately by all COAA members.

1.2 Responsibilities

COAA members are responsible for the implementation of this best practice within their project management systems. The development of hazard identification / analysis processes at each phase of design/construction from DBM through to pre-mobilization. If the COAA member retains the Prime Contractor responsibility then the COAA member is responsible to audit the hazard identification / analysis process for currency, accuracy, and integration during the projects life span.

Engineering houses are responsible for the implementation of this Standard within their project management systems. The development and implementation of hazard identification / analysis processes at each phase of design from the Scoping study phase through DBM, and EDS phases.

The “Prime Contractor” is responsible for the implementation of this Standard within their project management systems. The development and implementation of hazard identification / analysis processes at each phase of construction from the identification and acceptance of the “Prime

Contractor" role, through the contractor selection and pre-bid meetings, during the construction phase and concluding at the contract completion. The Prime Contractor is responsible to audit the "hands on" contractor and their hazard identification / analysis process for currency, accuracy, and integration during the projects life span.

"Hands On" contractors are responsible for the implementation of this Best practice within their project management systems, and the development and implementation of hazard identification / analysis processes at each phase of construction from the pre-bid meeting through to turn-over to the client.

1.3 Definitions

DBM

Design Basis Memorandum

EDS

Engineering Design Specification

Hazard Identification / Analysis

The objective of any hazard identification / Analysis process is to introduce hazard identification and controls early in the project by identifying risks associated with the project.

Hazard Assessment

A formal process used to identify hazards that may create losses to people, equipment, materials, property or the environment.

HAZOP

A Hazard and Operability (HAZOP) study is a structured process which is intended to identify all possible deviations from the way a design is intended to work and all of the hazards or operational difficulties associated with those deviations.

Job Hazard Analysis (JHA)

During the hazard assessment process certain tasks will be identified that present additional risk. These tasks will require additional review and assessment and a specific safe work procedure developed for the task.

Procedures

Procedures refer to step-by-step task descriptions associated with project.

Risk

Probability that during a period of activity a hazard will result in an incident with definable consequence

Risk Management

Reduction of the consequence and probability of risk or risks to an acceptable level to ensure a zero injury workforce

2. BEST PRACTICE

A majority of the hazards associated with a project can be and are identified early in the design and development phase through the use of formalized hazard analysis techniques.

Typically, the engineering and the owner representatives will conduct a macro hazard identification / analysis and correct and control identified hazards in the design and engineering phases of the project. This is prior to the “hands on” contractor selection phase.

It is recommended that the result of the hazard identification / analysis process are incorporated at the various design reviews, and contractor assessment meetings (DBM, EDS, pre-bid meeting, contract award meeting, and pre-mobilization meeting- see hazard identification / Analysis process flow chart). A copy of all hazard identification / analysis (“macro analysis”) must be part of the owner’s deliverables, at the pre-bid meeting, to the “hands on” contractors bidding the work.

Hazard identification, analysis, and reporting do not terminate at the pre-bid meeting. The hazard identification / analysis process, like the entire EHS process must be an on-going active “evergreen” process if it is to affect the EHS performance of the project.

The macro analysis provided to the “hands on” contractors should be a summary of all of the hazard identification / analysis completed prior to the “pre-bid” meeting. It should provide a background to the contractor on the scope of the project, and the limitations of the assessment (see Appendix 1A.).

The analysis should then describe in general the hazards associated with the location of the project (see Appendix 1A.).

Health and hygiene hazards need to be considered, based on the scope of the project, and current controls for these hazards are to be outlined with any suggested controls for the length of the project. Applicable owner, or prime contractor procedures, practices, standards, and policies should be referenced for the contractor’s use (see Appendix 1A.).

Safety hazards need to be considered, based on the scope of the project, and current controls for these hazards need to be outlined with suggested controls for the length of the project. A comparison of the possible tasks during the project to the legislated Occupational Health and Safety requirements is suggested. Applicable owner, or prime contractor procedures, practices, standards, and policies should be referenced for the contractor’s use (see Appendix 1A.).

Environmental hazards need to be considered, based on the scope of the project, and current controls for these hazards need to be outlined with suggested controls for the length of the project. A comparison of the possible tasks during the project to the owner or site environmental requirements is suggested. Applicable owner, or prime contractor procedures, practices, standards, and policies should be referenced for the contractor’s use (see Appendix 1A.).

Security concerns need to be considered, based on the scope of the project, and current controls for these hazards need to be outlined with suggested controls for the length of the project. A comparison of the possible concerns during the project to the owner or site security requirements is suggested. Applicable owner, or prime contractor procedures, practices, standards, and policies should be referenced for the contractor’s use (see Appendix 1A.).

After delivery of the macro analysis to the contractor; the contractor is then expected to take the owner’s macro analysis and make it contract specific. The contractor will integrate this macro

analysis, and develop their site specific EHS plan based on their micro (task specific) hazard id / analysis.

The contractor's EHS plan should be submitted to the owner, or Prime Contractor, at the contract submission stage for review as part of their contract submission. COAA members should incorporate this into their contract requirements, and review the submission for completeness and project competency. This then becomes a due diligence document for the owner and prime contractor.

Through the life of the program, the hazard identification / analysis must constantly be reviewed for currency and accuracy. It is an "evergreen" document that is the basis for the integration of EHS systems in the project scheduling and planning process. It is then the responsibility of the owner, or prime contractor, to audit the hazard identification / analysis process for currency, accuracy, and integration during the projects life span.

3. IMPLEMENTATION

Implementation by COAA members requires integration of this best practice in COAA member's Engineering and Design, Contractor Management, and Hazard Analysis standards, practices and procedures.

Engineering and Design

In the engineering and design phase; hazard assessments, of any type need to be conducted with the results documented and carried forward to the next stage of design to ensure consistency in the development of the hazard assessment and control process through out the life of the project. These assessments (including environmental impact assessments) are the foundation of the macro assessment.

Contractor Management

The contractor management phase requires the creation of a macro assessment – Hazard Identification / Analysis Process – to be in place prior to the start of the project.

To ensure that this measurement is met for all industrial projects it is necessary for COAA members to review their contractor management program from the qualification and pre-bid phase through to commissioning and turnover of the project. Resources are required to complete the Owner's portion of the hazard identification / analysis process as well the evaluation of the contractor's EHS plan based on the hazard identification / analysis and the contract specific task analysis. In addition resources are necessary for the auditing function to ensure that the hazard identification process utilized by the contractor is current and accurate.

Hazard Identification Analysis

Hazard analysis requires COAA members to implement a hazard identification tool that meets the general template provided, and to ensure competent individuals facilitate this process.

Implementation

Leadership within each COAA member is responsible to carry out the implementation of this and other COAA endorsed best practices within the framework of their organizations.

4. INTERPRETATION AND UPDATING

The Safety Chairperson of the Construction Owners Association of Alberta, Safety Committee shall ensure interpretation and updating of this best practice.

5. APPROVED BY

Peter Dunfield
Safety Chairperson
Construction Safety Association of Alberta (COAA)

Attachment 1A.

Known and Potential
Health, Safety, Environment and Security

Pre-Bid Hazard Identification / Analysis

Contract Number: _____

Project Name: _____

Location: _____

Background:

- Describe the scope of the project.
- Establish the limitations of the analysis.
- Establish which hazard assessments have been completed to date and attach these assessments (provided there are not intellectual property issues) to the appendix.

Location:

- Define the specific location of the project.
- Include any hazards directly the result of location (examples may include):
    - traffic hazards, and access to the site
    - congestion due to the plot plan,
    - environmental considerations due to water runoff
    - weather
    - process considerations
    - known or unknown underground utilities
    - soil compaction with regards to trenching/excavations
    - emergency response concerns
- Include suggested controls for the identified hazards
- Include a reference to any studies or hazard assessments that assessed the location previous to this document (add documents to the Appendix).

Health:

- Define the specific health, and hygiene issues related to the project or site.
- Include any health, and hygiene hazards directly the result of project (examples may include):
    - A list of possible chemical and biological exposures (MSDS requirement) as a result of the location of the project, or the materials to be used in the construction phase (generally).
    - Determination of substances and processes requiring a code of practice
    - Occupational exposure limits for possible chemical or biological substances
    - Noise exposure (add documents to the Appendix).
    - Current, and past industrial hygiene studies, and determination of adequacy of the in-place program for the project (add documents to the Appendix).

- Suggestions for improvement of the monitoring of exposures over the life of the project
- Occupational Health Service needs based on the expected manpower requirements (include a construction manpower chart over the life of the project), and the regulatory requirements.

- Include suggested controls for the health, and hygiene hazards
- Include a reference to any studies or health/hazard assessments that determined the possible health hazards prior to this document (add documents to the Appendix).
- Include a reference to related owner, or prime contractor procedures, practices, standards, or policies.

Safety:

- Define the specific safety issues related to the project or site.
- Include any safety hazards directly the result of the project (examples may include):

    - Excavations/trenching
    - Working at elevations
    - Engineered, critical lifts
    - Hot Work
    - Confined Space
    - Lockouts
    - Tie-ins, hot taps
    - Personal Protective Equipment requirements
    - Permitting

Include a determination of the applicability of the Alberta Legislated Hazard Assessment requirements versus the scope of the project

- 52(1) Confined spaces
- 165(1) Explosive atmosphere
- 210 Manual lifting
- 221(1) Noise
- 228(1) PPE
- 233(2) Footwear
- 241(1) Life jackets
- 242 Limb/body protection
- 244(1) RPE (airborne contaminants)
- 270(3) ROPS
- 272(1) FOPS
- 291 Radiation
- 310(2) Machine guards
- 317 Machine failure
- 319 Cutting machines
- 362 Machine contact
- 389 Violence
- 393 Working alone

- Include a determination of the applicability of the Alberta Legislated Safety related code of practice requirements versus the scope of the project.

    - Confined Space
    - Respiratory Protective Equipment
    - Fall Protection Plan
    - Emergency Response

- Include suggested controls for these safety hazards
- Include a reference to any studies safety hazard assessments that assessed the possible safety hazards prior to this document (add documents to the Appendix).
- Include a reference to related owner, or prime contractor procedures, practices, standards, or policies.

Environment:

- Define the specific environmental issues related to the project or site.
- Include any environmental hazards directly the result of the project (examples may include):

    - Soil contamination
    - Air quality plan
    - Process upsets as a result of a construction incident
    - Waste handling
    - Hazardous waste
    - Recycle plan
    - Water management plan
    - Spill control
    - Emissions control
    - Discovery of unexpected conditions
    - Controlled products plan (Workplace Hazardous Information Management System)

- Include a determination of the applicability of the Alberta Legislated Environmental requirements versus the scope of the project (examples may include):

    - Alberta Environmental Protection and Enhancement Act
    - Operating Approvals (Limits of release)
    - Transportation of Dangerous Goods
    - Alberta Energy and Utilities Board Guide 55: Storage Requirements for the Upstream Petroleum Industry
    - Alberta Fire Code – Hazardous Waste Storage Guidelines

- Include suggested controls for these environmental hazards
- Include a reference to any studies or environmental impact assessments that determined the possible impact of the project prior to this document (add documents to the Appendix).
- Include a reference to related owner, or prime contractor procedures, practices, standards, or policies.

Security:

- Define the specific security issues related to the project or site.
- Include any security concerns directly the result of the project (examples may include):

    - Travel and site access
    - Defined site boundaries
    - Identification badges
    - Vehicle permits
    - Pre-Access Drug and Alcohol Testing

- Include suggested controls for these security concerns
- Include a reference to any studies or security assessments that determined the possible security implications of the project prior to this document (add documents to the Appendix).

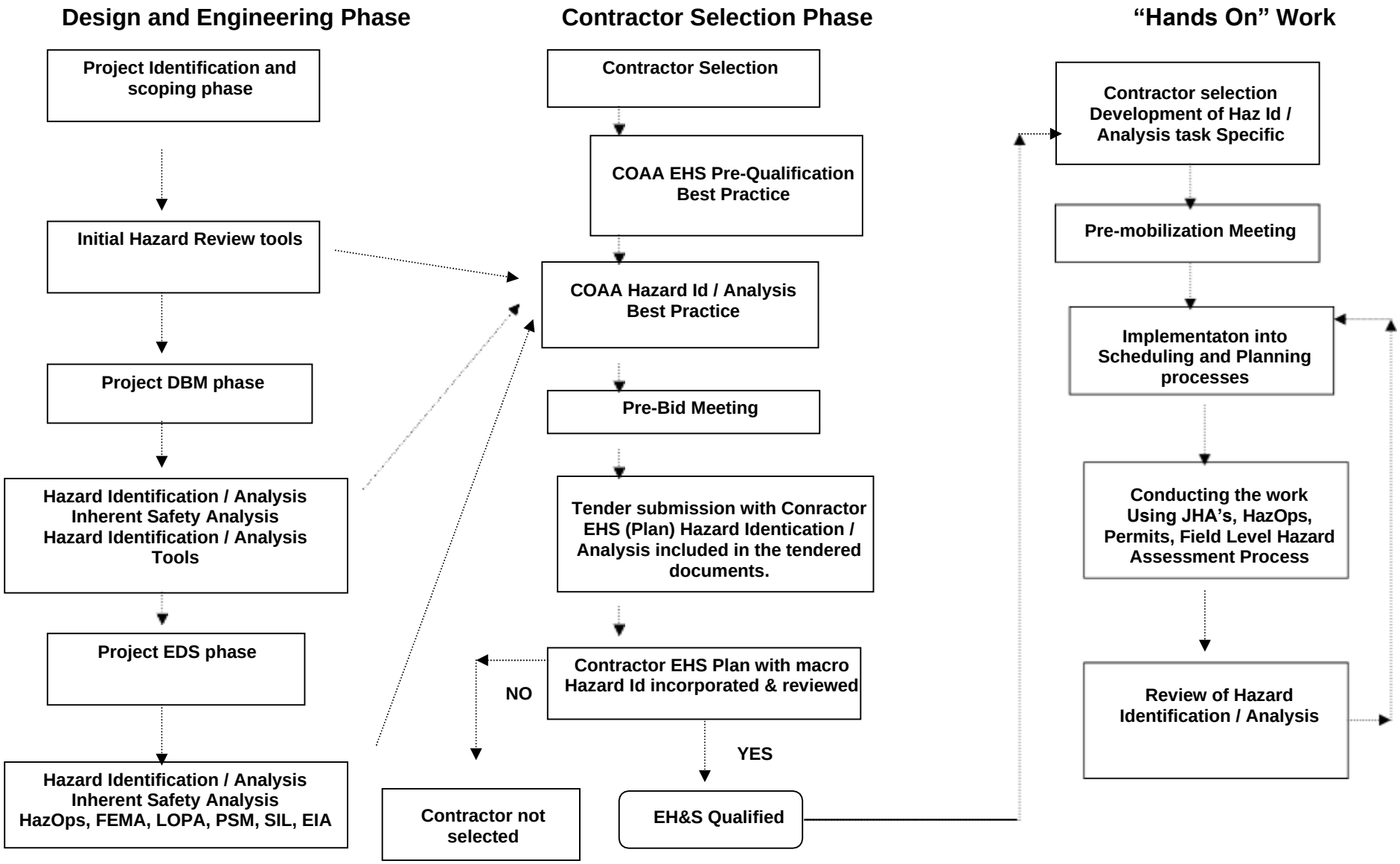
- Include a reference to related owner, or prime contractor procedures, practices, standards, or policies.

Appendix:

- Any document referenced in the Hazard Identification / Analysis

Attachment 1B.

Hazard Identification / Analysis Process Flow Chart



COAA Vision for Safety

“No one gets hurt in heavy industrial construction”

Safety Committee Mandate:

Work collaboratively to improve overall safety culture and performance in the construction industry - identify/develop/support Best Practices

Construction Owners Association of Alberta
Leading Indicator – Best Practice

In the fall of 2003 a discussion took place at the monthly COAA Safety Committee Meeting regarding the need to have common, consistent metrics to evaluate the safety performance of C ontractors working on various plant sites. The discussion revolved around 'lagging indicators' and the need to identify 'leading indicators' that could be used for this effort. A number of Safety Committee members volunteered to be part of a working group that would come up with 'leading indicators' that could be used to evaluate the performance of Contractors.

At the first meeting the Working Committee developed a path forward which would include developing a list of 'leading and lagging indicators'. This list was compiled from various sources – included a best practice that had previously been developed by the Construction Industry Institute (CII). In the end the Working Committee had a list of approximately 300 (leading and lagging) activities.

The Working Committee ranked each of the activities and identified the Top 30 Leading Indicators. This list was sent to all of the COAA Safety Committee members; and the members were requested to rank these indicators. From the information that was provided by the Safety Committee – the working committee came up with a list of the Top 10 Leading Indicators. It should be noted that in reality these indicators are really activities.

The Top 10 Leading (Activities) Indicators:

- **Behavioural based 0bservation process is in place and working**
- Focus (compliance) observation process is in place and working
- Near miss/near hit reporting process is in place and working
- Employee perception surveys are conducted to determine the state of EH&S health
- **Pre-screening of employees (D&A) is conducted**
- **Contractor selection (EH&S) process is in place prior to the start of a Project**
- Active management safety participation – tours / walkabouts / written communications
- Supervisor's safety activity is evaluated at regular intervals
- Hazard identification/analysis process is in place prior to the start of a Project
- **FLRA are conducted prior to the start of new work/at the beginning of shift**

The working committee decided that as part of its mandate they would develop 'best practices' for each of the 'leading activities'. Fortunately four (**noted in bold**) of the activities had already had 'best practices' developed by the COAA Safety Committee and thus the other six were assigned to various Working Committee members.

- Focus (compliance) observation process is in place and working – Pat Robinson - Mammoet
- Near miss/near hit reporting process is in place and working – Sterling Rideout - Colt
- Employee perception surveys are conducted to determine the state of EH&S health – Doug Kelly – Lockerbie and Hole
- Active management safety participation – tours / walkabouts / written communications – Doug Kelly– Lockerbie and Hole
- Supervisor's safety activity is evaluated at regular intervals – Sterling Rideout - Colt
- Hazard identification/analysis process is in place prior to the start of a Project – Murray Evenson – Lockerbie and Hole

Once a 'best practice' was developed – it was circulated for feedback amongst the Working Committee. Once it was deemed to be complete – it was forwarded to the COAA Safety Committee members for feedback. This feedback was incorporated in to the final version of the 'best practice'.

In May of 2004 as part of the Annual COAA Best Practices Conference a workshop was held by the Working Committee to review their activities. All of the 'best practices' and the presentation made at the Best Practices Conference are attached.

Mark L. Halama
Chair – Leading Indicator Best Practices Working Committee
Suncor Energy Inc.

DEPARTMENT: **Construction Owners Association of Alberta**

SUBJECT: **Near-Miss Reporting**
Leading Indicator - Best Practice

1. PURPOSE

To communicate to COAA members a best practice for the implementation of a near miss reporting process that will identify opportunities to reduce risk exposure and improve EH&S systems structure.

1.1 SCOPE

To identify the benefits of having a good near miss process in place that will proactively improve the following EH&S processes:

- **Delegation of Safety Responsibility**: An effective near miss program shifts the task of identifying unsafe operations from Environmental, Health and Safety (EHS) management, to a much larger workforce that has intimate contact with process operations/equipment. By harnessing this larger workforce a greater number of safety related issues could be identified and addressed.

- **Increased Safety Awareness**: By making individuals more safety conscious and by shifting the responsibility of identification of near misses, unsafe conditions and behavior to each individual in the work force, both on and off the job safety of employees can be improved significantly.

- **Data Collection Pool:** The collection and analysis of near-miss data can reduce accident frequency through a) identification of similar incident precursors at other facilities, and b) pattern observation and trend analysis over time. Such a knowledge base would reduce risk exposure in on-going operations as well as future equipment, process and plant designs**.**

1.2 DEFINITION:

An event that under different circumstances would have resulted in loss to people, equipment, materials or the environmental.

The Wharton School report defined it as:

An opportunity to improve safety practices based on a condition or an incident with the potential for a more serious consequence.

STANDARD:

A successful near-miss process is achieved through carefully designed EH&S management systems with a positive organizational EH&S culture.

The seven steps to manage a successful near-miss process are:

A. Identification
B. Reporting
C. Communications
D. Cause Analysis
E. Corrective Action

F. Implementing Corrective Action
G. Follow-up

2.1 IDENTIFICATIONS:

Identification of a near miss is the first stage of the near miss process. In this stage having a clear definition and perception of a near miss event should be clearly commicated to all personnel. The definition should be anything that an employee views worthy to address to eliminate or reduce a potential to cause harm. The definition should include:

- Unsafe Conditions
- Unsafe Behavior
- Minor Incidents
- Property Damage
- Environmental Damage

2.2 REPORTING:

Management must create a culture where reporting of near misses is encouraged, and employees do not feel pressure not to report because of disciplinary action or peer pressure.

Completion of long forms will discourage reporting. Though the follow-up action may require a more detailed investigation, a simple near miss report and submission generally suffices for majority of near misses. If trying to find a near-miss report involves going to other areas, scrolling through web sites and not knowing who to report to will decrease reporting. Only one method for reporting may discourage employees from participating. Encourage employees to report a near miss any way they feel comfortable. Recognize employee thru incentive programs and remove the fear of disciplinary action.

2.3 COMMUNICATIONS:

Communicating information from near miss reporting remains a primary obstacle to the success of most near miss processes. To create a system to transfer near miss information to EH&S and employees to increase awareness of the condition or hazard the following must be ensured:

- Information must travel quickly.
- Information must reach all personnel.
- Information must be accurate and presented in a useful and understandable format.

2.4 CAUSE ANALYSIS:

When a near miss has occurred the next objective is to determine what action is required to ensure the near miss could not reoccur.
Two steps are required in determining the action to be taken:

1. Identify the causes / root cause
2. Identify solutions

In many instances an informal process between a supervisor and employee can determine actions taken. In cases where root cause is not apparent an investigation team may be required to determine the root cause and solutions.

2.5 CORRECTIVE ACTIONS:

It is imperative that a process be in place ensuring that all action items identified are followed until closure is in place to ensure employees see the benefits of reporting.

A system should be in place to promote action items that result from follow up to the near miss, this will ensure management accountability and provide feedback to employees. Posting and promoting near miss reports that are closed will ensure employees that action was taken.

2.6 IMPLEMENTING CORRECTIVE ACTIONS (MANAGEMENT RESPONSIBILITY):

Action items should be communicated to all employees to ensure that everyone has a through understanding of the recommendations. This would prevent miss interpretation or " Not viewed as important".

2.6 FOLLOW UP:

All near miss reports should be collected in a database. Often near misses are collected but rarely is the information communicated to address underlying safety issues.

3. INTERPRETATION AND UPDATING:

The Safety Chairperson of the Construction Owners Association of Alberta shall ensure interpretation and updating of their standard.

4. Approved By _____

Peter Dunfield
Chairperson
Construction Safety Association of Alberta