Integrating Lean Six Sigma with your Safety Program

Safety Measurement Systems: Are you Measuring Success?
Presenter: Brett Haskins, CSP

Introduce concepts that will help to transition you toward a zero-incident safety culture
Introduce safety metrics that track upstream activities and recognize success
Identify some measures that have proven results
Challenge you to engage in these concepts

Purpose

Safety Performance Indicators

Traditional Indicators - Lagging
- Reactive
- Measure results only
- Presence or Absence of Failure

Leading Indicators
- Upstream indicators of what your organization is doing (daily, weekly, monthly, etc.) to ensure the presence of safety and not just the absence of incidents and injuries

Lean Six Sigma
Safety Program
What makes a difference in safety?

Level One Tools – Reacting | High Incident Rates
Compliance Programs, Work Orders, Incident Investigation, Safety Meetings

Level Two Tools – What We See | Moderate Incident Rates
Observation Programs, Job Safety Analysis, Near-Miss Reporting, Inspections

Level Three Tools – What We Do | Low Incident Rates
Safety Accountability Systems

Level Four Tools – What We Believe | Benchmark Incident Rates
Unseen cultural reality

Level Five Tools – How We Engage | Best-in-Class Incident Rates
Effective data-driven safety teams

Level Six Tools – How We Lead | Approaching Zero
Culture in action: participation, ownership, execution, live a passion for safety excellence

“Level One” Leading Indicators
Compliance Programs (OSHA, DOT, etc.)
- A passion for foundational perfection
- A culture of correct
  - % on-time completion of Safety Training
  - Pre & Post test scoring
  - Program and Procedures completion and review

Work Orders
- Focus on conditions (maybe 5% of all injuries), but dangerous traps
- Manage the backlog, measure timely completion per risk

Incident Investigation
- Timely closure on AIM for every incident
- Post Injury Management excellence (timely Return to Work)
- Follow up on Corrective Actions to ensure sustainability and accuracy

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“Level Two” Leading Indicators
Job Safety Analysis (SOP’s, SJP’s, Pre-Ops, etc.)
- # or % of employees involved in development
- # or % used in a quality way
- Integral part of existing documents and procedures, rather than safety being a “bolt-on”

Job Safety Briefings
- Pre-shift and on the spot, as conditions dictate – measure quality
- Number reported per crew per week
- # or % solved per crew per week
- Action Item Matrix timely completion per risk
- A recognition system that reinforces intense participation and resolution

Near-Miss Reporting
- Includes both conditions and accountability activities
- May hourly, supervision and management participation
- Identifies, measures and recognizes those things that are being done right, rather than just identifying what is wrong

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“Level Three” Leading Indicators
Safety Accountabilities developed by a team:
- Applied and lived at all levels of the organization
- Connected through all levels
- Quality completion is measured and recognized
- Include Safety Process training by employees at all levels
- Include Safety Culture training by employees at all levels

The Safety Accountability Cycle
Four Steps to Accountability

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Accountability: World Class vs. Traditional
Message to Management

- Everyone is in charge of safety.
- Pay attention to the "how and what needs to get done."
- Focus on activities that will produce a safe work environment, rather than on results you hope to achieve.
- Manage safety the same way you manage other things that are important to your organization and you will get the same results.

The Solution

1. Defining activities is the first step.
2. Define safety accountabilities (activities) that are:
   - Specific
   - Appropriate to the role
   - Measurable – quantity and quality
   - Meaningful – to the work and show sincerity
   - Are connected at all levels within the organization
   - Meet the Six Criteria for Safety Excellence

   "The minimum level of expectation becomes the maximum level of performance."

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Safety Program

Six Criteria for Safety Excellence

- Top management is visibly committed
- Middle management is actively involved
- Supervision is performance-focused
- Hourly employees are actively participating
- System is flexible to accommodate site culture
- Safety system is positively perceived by workforce

― Dan Petersen, Ed.D.
Integrating Lean Six Sigma with your Safety Program

Six Criteria for Safety Excellence

- Top management is visibly committed
- Middle management is actively involved
- Supervision is performance-focused
- Hourly employees are actively participating
- System is flexible to accommodate site culture
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— Dan Petersen Ed.D.

Accountability Criteria: Top Management

- Must show visible participation in the safety management process
- Must include receiving information regularly on who is and who is not performing safely by some pre-determined criteria
  - Who is performing the best quality inspections, investigations, safety meetings, etc.
- Must hold middle managers accountable for their performance

Accountability Criteria: Middle Managers

- Must personally engage in some agreed upon visible tasks that shows their active involvement to the hourly workforce
- Must ensure supervisor/subordinate performance
- Must ensure the quality of that performance

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Middle Manager Accountability Examples

- Actively participate in investigations of high ranked incidents and near misses
- Perform and record a meaningful safety exchange with an employee or group of employees at least three times per quarter
- Make a quality assessment of and report on subordinate safety accountability performance every quarter
- Oversee the execution of the annual safety leadership plan
- And more …

Supervisors Accountability Examples

The role of the supervisor is to ensure quality performance of pre-defined activities.

Examples include:

- Good quality safety meetings prior to start of each shift
- On time and quality Near Miss resolution
- Quality safety contacts perceived as beneficial by the workforce
- Inspections completed and issues resolved on time and in quality way

Employee Accountabilities

The employee accountability is to actively participate in the safety process. Possible measures for those accountabilities might include:

- Injury/near-miss reporting and self-resolution statistics
- Participation in Job hazard analysis reviews
- Housekeeping conditions and audit scores
- Documentation of safety meeting attendance
- Completion of safety training
- Safety work order initiation records
- Quarterly safety goals and follow-up review
- Participation in safety involvement teams to solve issues
- And more … that measure the presence of safety

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Safety Accountabilities sample - Progress Rail

**District Manager**

On a weekly basis, ask at least two open-ended questions of the supervisor(s) about how the mentoring process is going.

**Plant Manager**

On a weekly basis, ask at least two open-ended questions of the supervisor(s) about how the mentoring process is going.

**Supervisor**

On a weekly basis, ask at least two open-ended questions of the mentor about how the mentoring process is going.

**Employee**

On a weekly basis, ask at least two open-ended questions of the mentor about how the mentoring process is going.

**Plant Manager**

On a weekly basis, ask at least two open-ended questions of the supervisor(s) about how the mentoring process is going.

**Safety Coordinator**

On a weekly basis, ask at least two open-ended questions of the employee about how the mentoring process is going.

**Supervisor**

On a weekly basis, ask at least two open-ended questions of the employee about how the mentoring process is going.

**Employee**

On a weekly basis, ask at least two open-ended questions of the employee about how the mentoring process is going.

**Safety Accountabilities sample – Snohomish PUD**

**AGM**

Attend a minimum of two meetings per group, per year, bringing positive safety observations.

**Safety Chair**

Establish agenda in conjunction with Safety Specialist.

**Senior Manager**

Attend and actively participate in safety meetings.

**Foreman / Lead**

Weekly safety briefing:

**Safety Coordinator**

Inform employees of new laws and new District policies.

**Employees**

Participate and be involved in safety meetings.

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**Are We Managing Safety?**

1. **What do you do on a regular basis to prevent accidents?**

2. **What do you expect your employees to do?**

3. **How do you measure and recognize safety performance?**

4. **How do you reward and recognize safety performance?**

5. **What does your boss expect you to do on a regular basis to prevent accidents?**
Integrating Lean Six Sigma with your Safety Program

Level Three

- All employees know what they do on a daily basis to prevent incidents and are held accountable for these activities... no different than quality and production.
- These personal safety accountabilities are the leading safety metrics.

A System of Accountability

Level One Tools – Reacting | High Incident Rates
Compliance Programs, Work Orders, Incident Investigation, Safety Meetings

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Level Four Tools – What We Believe | Benchmark Incident Rates
Unseen cultural reality

What makes a difference in safety?

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“Level Four” Leading Indicators

- Safety Perception Survey indicator scores
- One-on-One Employee Interviews occurring
- Action Item Teams working on level four issues identified in the survey
- Cultural training with executive involvement
"Treatment without Diagnosis is Malpractice."

Survey Safety Management Categories
- Attitude Towards Safety
- Awareness Programs
- Communication
- Discipline
- Employee Training
- Goals of Safety Performance
- Hazard Correction
- Incident Analysis
- Inspections
- Involvement of Employees
- Management Credibility
- New Employees
- Operating Procedures
- Quality of Supervision
- Recognition for Performance
- Safety Climate
- Safety Contacts
- Substance Abuse
- Supervisor Training
- Support for Safety

Lean Six Sigma Safety Program

Results by Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Emp</th>
<th>Sup</th>
<th>Mgr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspections</td>
<td>54.2</td>
<td>64.0</td>
<td>77.5</td>
</tr>
<tr>
<td>Recognition for Performance</td>
<td>58.5</td>
<td>61.9</td>
<td>42.4</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>59.8</td>
<td>54.6</td>
<td>43.8</td>
</tr>
<tr>
<td>Operating Procedures</td>
<td>60.2</td>
<td>60.0</td>
<td>90.5</td>
</tr>
</tbody>
</table>
### Results to Specific Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Emp.</th>
<th>Sup.</th>
<th>Mgr.</th>
<th>Percent Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think your organization seeks prompt correction of problems found during inspections?</td>
<td>49.0</td>
<td>67.0</td>
<td>57.1</td>
<td></td>
</tr>
<tr>
<td>Do you have problems obtaining support for the correction of hazardous conditions?</td>
<td>51.0</td>
<td>66.9</td>
<td>78.4</td>
<td></td>
</tr>
<tr>
<td>Are records kept of potential hazards found during inspections?</td>
<td>64.4</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

### Bottom 10 Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Emp.</th>
<th>Sup.</th>
<th>Mgr.</th>
<th>Percent Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would a safety incentive program cause you to work more safely?</td>
<td>30.3</td>
<td>38.5</td>
<td>47.2</td>
<td></td>
</tr>
<tr>
<td>Have you used the safety involvement teams to get action on a complaint or hazard which concerned you?</td>
<td>31.3</td>
<td>38.5</td>
<td>40.6</td>
<td></td>
</tr>
<tr>
<td>Are risks involved sometimes overlooked in order to get the job done?</td>
<td>42.3</td>
<td>63.8</td>
<td>69.0</td>
<td></td>
</tr>
<tr>
<td>Is your family more concerned about off-the-job safety as a result of the organization's safety program?</td>
<td>45.1</td>
<td>54.7</td>
<td>57.4</td>
<td></td>
</tr>
</tbody>
</table>

### Top 10 Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Emp.</th>
<th>Sup.</th>
<th>Mgr.</th>
<th>Percent Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your organization actively encourage employees to work safely?</td>
<td>97.7</td>
<td>99.2</td>
<td>99.0</td>
<td></td>
</tr>
<tr>
<td>Is safety considered important by management?</td>
<td>95.6</td>
<td>97.5</td>
<td>97.6</td>
<td></td>
</tr>
<tr>
<td>Does alcohol or drug use increase incident risks?</td>
<td>94.6</td>
<td>96.7</td>
<td>97.9</td>
<td></td>
</tr>
<tr>
<td>Do you initiate action to correct hazards?</td>
<td>93.6</td>
<td>98.3</td>
<td>98.4</td>
<td></td>
</tr>
<tr>
<td>Do employees caution other employees about unsafe practices?</td>
<td>93.0</td>
<td>95.2</td>
<td>90.5</td>
<td></td>
</tr>
<tr>
<td>Does your organization have established goals for safety performance?</td>
<td>92.0</td>
<td>94.5</td>
<td>96.6</td>
<td></td>
</tr>
<tr>
<td>Do most supervisors have a good knowledge of the safety aspects of their jobs?</td>
<td>90.9</td>
<td>97.1</td>
<td>96.1</td>
<td></td>
</tr>
<tr>
<td>Does management insist upon proper medical attention for injured employees?</td>
<td>90.4</td>
<td>95.2</td>
<td>98.7</td>
<td></td>
</tr>
</tbody>
</table>

### Lean Six Sigma Safety Program
Interview question examples for each level

1. Describe the corrective action process.
2. How are unsafe work practices corrected?
3. How does upper management reinforce the importance of safety?
4. Describe Continuous Improvement Teamwork.
5. If you were in charge of safety, what would you do differently?
6. What makes a difference in safety?

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- Effective data-driven safety teams

Lean Six Sigma Safety Program

“Level Five” Leading Indicators
- Effective data-driven Continuous Improvement Teams
- Utilize data to implement the 2-3 year plan
- POP and AIM in place and tracking completion
- CI Team leader training and practicing
- % or # of employees involved in teams and improvement ideas
- Sample surveys being conducted by CI Team to determine what improvements are working and what needs to be changed.
POP Statement: Inspection C.I. Team

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Work</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B. Develop inspection accountability for all levels (Policy Statement)</td>
<td>Yes - 8/15</td>
</tr>
<tr>
<td></td>
<td>A. Team reviews existing check lists &amp; decides to revise them</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>A. A training program set up by EHS for the new inspection system</td>
<td>Not Applicable</td>
</tr>
<tr>
<td></td>
<td>C. Develop the system present to management for critique and approval</td>
<td>On-going</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purpose</td>
<td>Develop a comprehensive inspection system that identifies all hazards to help us achieve zero injuries</td>
<td></td>
</tr>
</tbody>
</table>

Process
Use a Hybrid Kaizen Event to develop the improved process and the 4 steps to accountability to build a robust Pre-Planning and Operating Procedures process.

Fault Tree

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Safety Program

Cause & Effect
**Inspection Continuous Improvement Team**

**Follow-up AIM**

Members in attendance: Robert, Richard, Frank, Chad, Cathy, Steve, Mark

<table>
<thead>
<tr>
<th>ACTION ITEM</th>
<th>WHO</th>
<th>TARGET DATE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Next meeting 8/1 at 1 pm. Reserve a room.</td>
<td>Norm</td>
<td>7/27</td>
<td>Done X</td>
</tr>
<tr>
<td>2. Type notes &amp; prioritize outcomes</td>
<td>Frank</td>
<td>Before 8/1</td>
<td>Notes typed. Items prioritized 8/1 X</td>
</tr>
<tr>
<td>3. Review flip chart (figure out hard to read words)</td>
<td>Team</td>
<td>8/1</td>
<td>Done- 8/8 X</td>
</tr>
<tr>
<td>4. Team Leader/Facilitator TBD on 8/1</td>
<td>Frank</td>
<td>8/1</td>
<td>Norm- Team Leader, Frank- Secretary X</td>
</tr>
<tr>
<td>5. Finish off action item matrix</td>
<td>On going</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Develop physical inspection for each dept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Develop personnel inspection for each dept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Get other assistance for inspection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Develop our process for doing this Inspection/flow chart</td>
<td>Steve Ross- draft</td>
<td>8/15</td>
<td>Done- team reviewed “fault-tree” X</td>
</tr>
<tr>
<td>10. Bring up to 3 inspection sheets used in your department or area</td>
<td>All Team Members</td>
<td>8/8</td>
<td>Done X</td>
</tr>
<tr>
<td>11. Review inspection sheets- check for discrepancies, redundancies, good info for future use etc?</td>
<td>Frank</td>
<td>8/15</td>
<td>Inspection sheets from different dept are “all over the map” X</td>
</tr>
</tbody>
</table>

**Policy Statement**

- All personnel shall be familiar with this policy.
- Employee’s responsibility: Periodically perform inspections and to participate in audits when required.
- Supervisor’s responsibility: Ensure all required inspections are performed within their area(s) of responsibility in a quality way, to ensure employees are trained to perform inspections, to participate in audits when required and to provide positive recognition when inspections are done correctly and workplace conditions are “right”.
- Manager’s responsibility: Periodically perform audits to ensure inspections are being performed in a quality way, to ensure records of audits are kept, provide positive recognition to those performing the best quality inspections, and to ensure observations or findings of inspections and audits are acted upon.

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**Safety Program**

**Inspection Guidelines**

- Audit/inspector: Employee assigned to make safety audit/inspection
- Responsibility
- All employees are responsible to participate in a safety audit/inspection of their work area or group according to the following pre-defined schedule:
  - General Manager – at least one per quarter
  - Directors – at least one / quarter
  - Managers – at least one / quarter
  - Supervisors – on a frequency developed by the individual department or at least as often as they inspect for production and quality issues (minimum of once per month)
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- Culture in action: participation, ownership, execution, live a passion for safety excellence

“Level Six” Leading Indicators
- Continuous improvement team leaders from all levels
- Executive Steering Team with all level representation
- Meets, Plans, Executes
- Tracking for Upstream Activities
- Clearly defined rewards for upstream activity culture excellence
- Injury/Incident downstream indicators improve every year
- Survey and interview scores regularly improve
- Zero-incident, zero-error mentality evident in all functions

A culture with a relentless, passionate pursuit of Zero

AIM Team Tracking

Action Item Status

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Customers transitioning to Zero Incident Performance
- Alltel
- Anaheim PUD
- ATCO Electric
- Atkinson Construction
- Dresser, Inc.
- Foamex
- Hawaii Electric Co.
- HOLT CAT
- MeadWestvaco

- Knife River
- Medtronic
- Navistar
- Pembina
- Progress Rail
- Plastipak
- Snohomish PUD
- Wagner Equipment Co.
- Walton Construction

CATERPILLAR SAFETY SERVICES
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Thank you for your time!

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