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Behavior Based Safety at PotashCorp

IFA Technical Conference
April 25-28, 2006

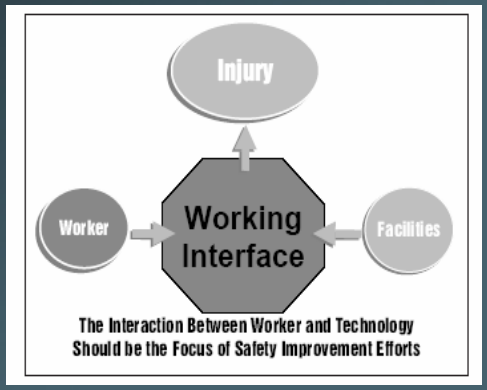
Vilnius, Lithuania

Challenge for Safety Improvement at PotashCorp

- 1995 recordable injury rate was > 2.5 (# of injuries X 200,000) / # of work hours in the period.
- Work with, not against, employees.
- Systematic approach for long term continuous improvement.
- Engagement opportunities for everyone in the organization.
- False dichotomy of either/or injury causation.
- Understanding and measuring the working interface.

The Working Interface

- Exposure occurs when workers interact with the technology.
- Interaction of physical conditions, management systems, and what people do.
- Focus on the working interface to pinpoint improvement efforts before an injury.



Applied Behavioral Analyses (ABC Analyses)

- Operates on the principle that antecedents set the stage for behavior and consequences encourage or discourage the repetition of behavior.
- Prior to understanding ABC analyses, we spent significant time focusing on antecedents (posters, signs, training, etc.) instead of changing the consequences that were controlling the behavior.

Understanding the Power of Consequences

- Antecedents trigger behavior.
- Consequences follow and control behavior.
- Not all consequences are equal in their effect.
- The most powerful consequences are soon/certain/positive.

Timing	Sooner – Touching a high voltage line results in immediate electrocution to the person.	Later – Hearing loss occurs over many years of exposure.
Consistency	Certain – It is certain in the person's mind that if they touch a high voltage line they will be electrocuted.	Uncertain – It is uncertain in the persons mind that if they do not wear hearing protection today that they will lose their hearing.
Significant	Positive – Given a choice, people tend to approach things that are positive for them.	Negative – Negative consequences tend to lead to undesirable side effects such as avoidance or the desire for revenge.

A	B	C
Not available	Failure to wear face shield while cutting bar on band saw in maintenance shop	Injury **SU-**
Peer pressure		Reprimand **S/LU-**
In a hurry		Save time **SC+**
No one else does		Comfort **SC+**
Lack of training		Convenience **SC+**
Time of day		Peer approval **SC+**
Scratched / dirty		Better vision **SC+**
Risk perception		

Four Key Characteristics of the Behavioral Accident Prevention Process® (BAPP®)

- Identify critical behaviors and design a data gathering sheet.
- Collect data on the working interface through behavioral observations.
- Provide feedback to employees.
- Remove barriers to safe performance.

Identifying Critical Behaviors

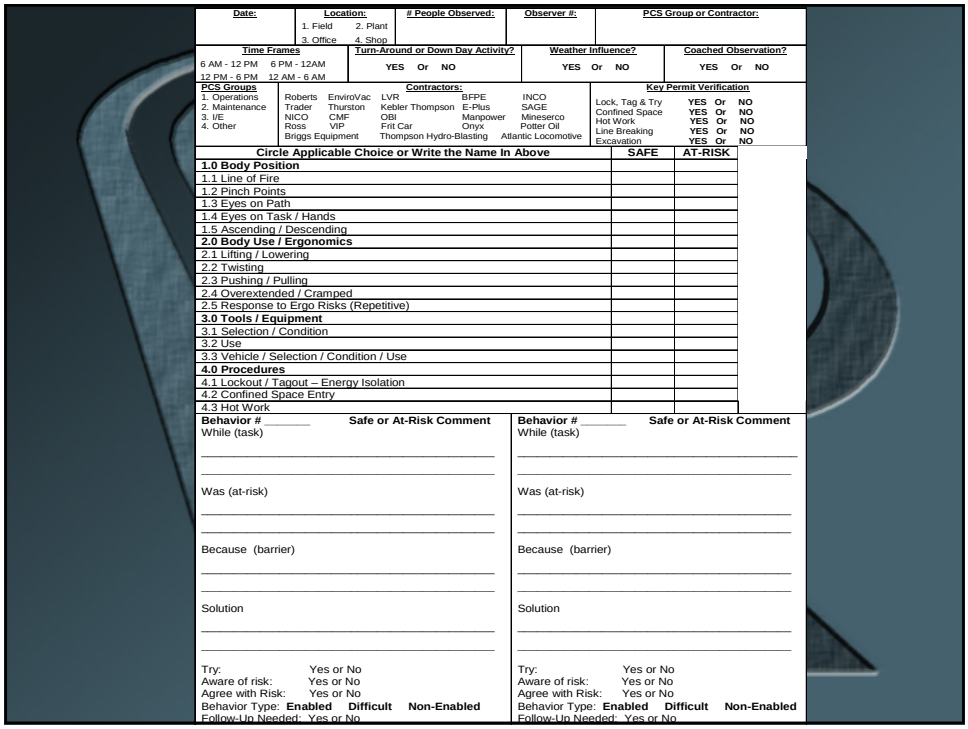
- Steering team analyses of several recent years of injury reports.
- Identifies 15-25 generic behaviors associated with over 90% of incidents.
- Critical because if performed safe or at-risk they change the likelihood that an injury will occur.
- Other important behaviors can be added.
- After extracting the behaviors, operational definitions are written.

Pareto Analyses of Site Incident Reports

Generic Behavior	Number of times seen	Percent of Incidents
Line of fire	8	24%
Pinch points	4	12%
Eyes on path	7	21%
Eyes on task/hands	4	12%
Ascending/descending	4	12%
Lifting/lowering	6	18%
Overextended/cramped	4	12%
Grip/force	2	6%
Tool selection/condition	9	27%
Tool use	4	12%
Barricades/warnings	3	9%
Lockout/tagout	1	3%
Eye protection	3	9%
Hand/arm protection	5	15%
Housekeeping	2	6%
Communication of hazard	2	6%
Pushing/pulling	3	9%
Total Number of Behaviors	71	
Total Incident Reports	33	
Average per Incident	2.15	

Operational Definitions

- Pinch Point – Does the person keep body parts from area between moving or stationary parts that are closing or may close together? For example:
  - When using a spanner to open a valve, pull on wrench instead of push when there is an obstruction in front of the valve.
- Tool Selection/Use – Does the person select the correct tool for the job? Is the person using the tool as designed? For example:
  - When using a box cutter to cut open boxes, cut away from your body.
  - When selecting a wrench to loosen bolts on pump base, use a box end wrench.
- Line of Fire – Is the person positioned so that if something gives way, lets go, releases, sprays, or falls, he or she will not be contacted? For example:
  - When breaking open a flange, loosen bolts on farthest side first.
  - When grinding, stand out of the path of flying debris.
  - When rodding out a valve, position face away from opening.



Date:	Location: 1. Field 2. Plant 3. Office 4. Shop	# People Observed:	Observer #:	PCS Group or Contractor:

Time Frames	Turn-Around or Down Day Activity?	Weather Influence?	Coached Observation?
6 AM - 12 PM 6 PM - 12AM 12 PM - 6 PM 12 AM - 6 AM	YES Or NO	YES Or NO	YES Or NO

PCS Groups	Contractors:					Key Permit Verification	
1. Operations	Roberts	EnviroVac	LVR	BPPE	INCO	Lock, Tag & Try	YES Or NO
2. Maintenance	Trader	Thurston	Kebler Thompson	E-Plus	SAGE	Confined Space	YES Or NO
3. I/E	NICO	CMF	OBI	Manpower	Mineserco	Hot Work	YES Or NO
4. Other	Ross	VIP	Frit Car	Onyx	Potter Oil	Line Breaking	YES Or NO
	Briggs Equipment		Thompson Hydro-Blasting		Atlantic Locomotive	Excavation	YES Or NO

Circle Applicable Choice or Write the Name In Above	SAFE	AT-RISK
1.0 Body Position		
1.1 Line of Fire		
1.2 Pinch Points		
1.3 Eyes on Path		
1.4 Eyes on Task / Hands		
1.5 Ascending / Descending		
2.0 Body Use / Ergonomics		
2.1 Lifting / Lowering		
2.2 Twisting		
2.3 Pushing / Pulling		
2.4 Overextended / Cramped		
2.5 Response to Ergo Risks (Repetitive)		
3.0 Tools / Equipment		
3.1 Selection / Condition		
3.2 Use		
3.3 Vehicle / Selection / Condition / Use		
4.0 Procedures		
4.1 Lockout / Tagout – Energy Isolation		
4.2 Confined Space Entry		
4.3 Hot Work		

Behavior # _____ **Safe or At-Risk Comment**

While (task)

Was (at-risk)

Because (barrier)

Solution

Try: Yes or No
Aware of risk: Yes or No
Agree with Risk: Yes or No
Behavior Type: **Enabled Difficult Non-Enabled**
Follow-Up Needed: Yes or No

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Gathering Data

- No sneak ups, no spying – open observation and discussion.
- No Name – No Blame.
- Use definitions and data sheet as a guide.
- 10% of employees actively perform observations.
- Lasts for 10-15 minutes including feedback.

Providing Feedback

- Feedback is information about performance in relationship to a goal.
- Peer on peer, informal conversations about what was seen. Reinforcing what was safe and exploration to identify the barriers for at-risk. Discover if behavior is enabled, difficult, or non-enabled.
- Posted and distributed charts and graphs of workgroup performance.

3 Types of Behavior

- Enabled = Well within the persons control. Changing a light bulb on a table.
- Difficult = Can be done but takes extra effort. Changing a light bulb in an overhead receptacle.
- Non-Enabled = Not within the persons control. Changing a light bulb on top of a 100' pole.
- Observers categorize behaviors in this manner

Removing Barriers

- Factor perhaps most critical to improving the working interface.
- Use the observers written comments to correctly address the type of behavior.
- Enabled behavior – Ongoing feedback to raise awareness.
- Difficult and Non-enabled – Steering team works with management to remove systemic barriers in systems and equipment that are creating exposure.

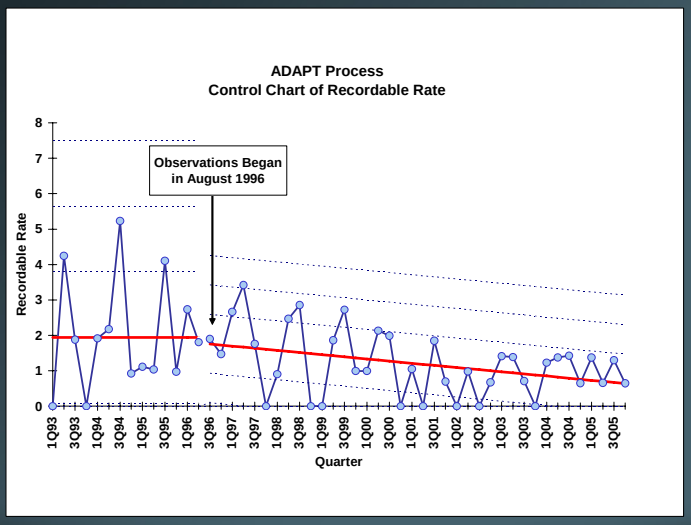
Role for Everyone

- Wage roll employees – The behavioral process provides true leadership opportunities for wage roll employees.
- Supervisors – Most influence over day to day activities that affect organizational performance outcomes.
- Senior managers – One of the most critical factors. Create the right climate and culture where an hourly led process can prosper.

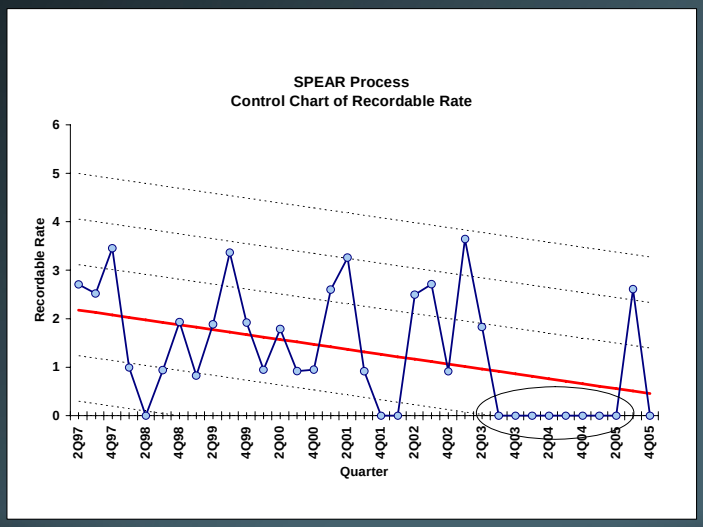
Current Implementation Status

- Have implemented process in 21 of 23 facilities. Canada, Trinidad, and United States. Vendor has implemented around the world.
- Currently implementing in last two sites.
- Both unionized and non-unionized workplaces.
- Employee populations range from 25 to 1100.

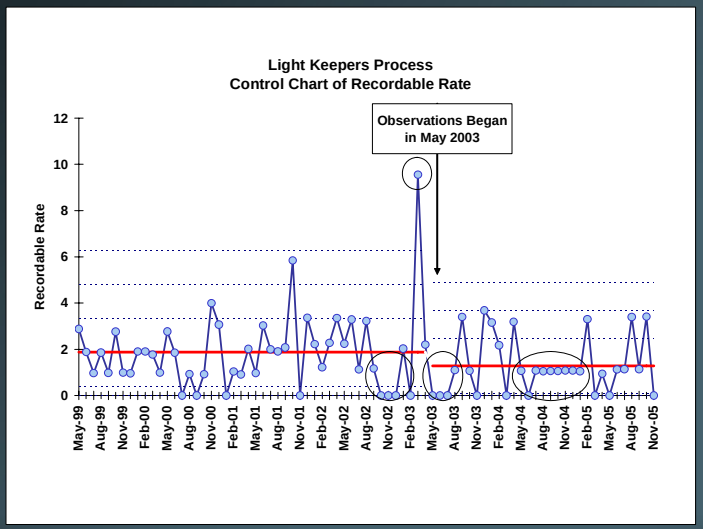
Results Nitrogen Plant



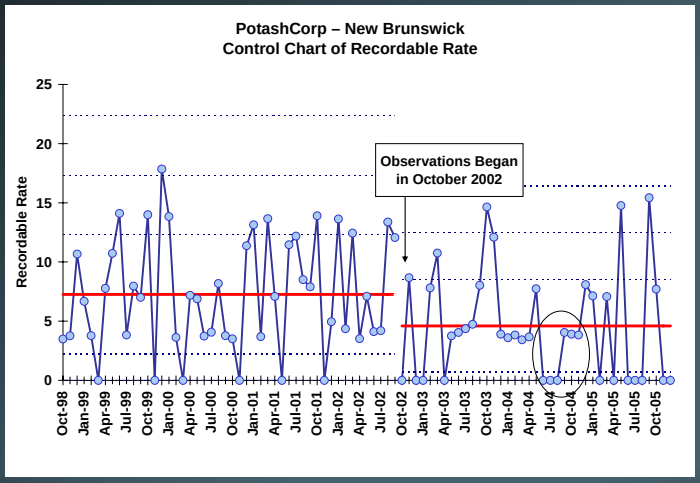
Results Nitrogen and Phosphate Plant



Results Phosphate Plant



Results Potash Mine



Conclusions

- Concepts make logical sense and may sound simple.
- Implementation to achieve long term results is more complicated.
- BBS is not a silver bullet.
- PotashCorp has achieved long term improvement.
- Climate and culture around safety has gotten much healthier.
- By everyone performing their role, the conversation around safety has changed from blame orientation to continuous improvement.