



Emerging Trends in Security  
“How to use Lean Six Sigma  
approach in Security  
Optimization”.

## Success Story

**ASIS INTERNATIONAL - EUROPEAN  
CONFERENCE**

**Barcelona April 13-16, 2008**

Presented by:

**Lili-Ann Mitchell, CPP**

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## Rio Tinto Alcan INTEGRATION

### The past months...

- ◆ July 2007 - Rio Tinto Offer
- ◆ October 2007 - Offer accepted by Alcan
- ◆ February 2008 - Rio Tinto Integration
- ◆ May 2008 - Rio Tinto Global Security Integration
- ◆ The project presented was completed prior to the integration and reflects the Alcan context

Rio Tinto Alcan

VOLUME 1  
NUMBER 1  
November 2007

# INTEGRATION NEWS

Creating the new global leader in aluminium, together

Welcome to the first edition of *Integration news* – your source for information about integration successes and milestones at Rio Tinto Alcan. Published regularly over the coming months, this newsletter is part of our commitment to provide you with timely and accurate information on the integration process.

Today, the focus is on leveraging our shared values and drive for excellence to seize the opportunities and realise the full potential created by uniting two industry leaders to become one. We encourage you to build on the positive momentum we have witnessed throughout Rio Tinto Aluminium and Alcan by remaining open to new ideas and suggestions for improving the way we do things. This is how we will blend two great organisations and, in the process, forge an even better one: Rio Tinto Alcan.

As we move through this phase of change, it is easy to get distracted, particularly by such announcements as Rio Tinto's intentions to divest Engineered Products. While we understand that this is a time of uncertainty for all parties involved, we would ask that you stay focused on your health and safety, and on meeting the needs of our customers and other stakeholders. This takes precedence over everything else.

Both of us, along with our senior management teams, will be actively involved in helping make this integration a success. How will we do this? Through trust, teamwork, communication, open-mindedness, respect for people and prompt decision-making – this is our commitment to you.

Rio Tinto Alcan is stronger than ever – thanks to you.

Best regards,

Tom Albanese  
Chief executive, Rio Tinto

Dick Evans  
Chief executive, Rio Tinto Alcan

An interview with the integration co-leads

*Integration news* met with integration co-leads Jean-Christophe Deslarzès and Phillip Strachan to get their views on how they see the integration initiative moving forward.

Read the full interview on page 2.

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  - Improve Phase
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- ◆ Conclusion



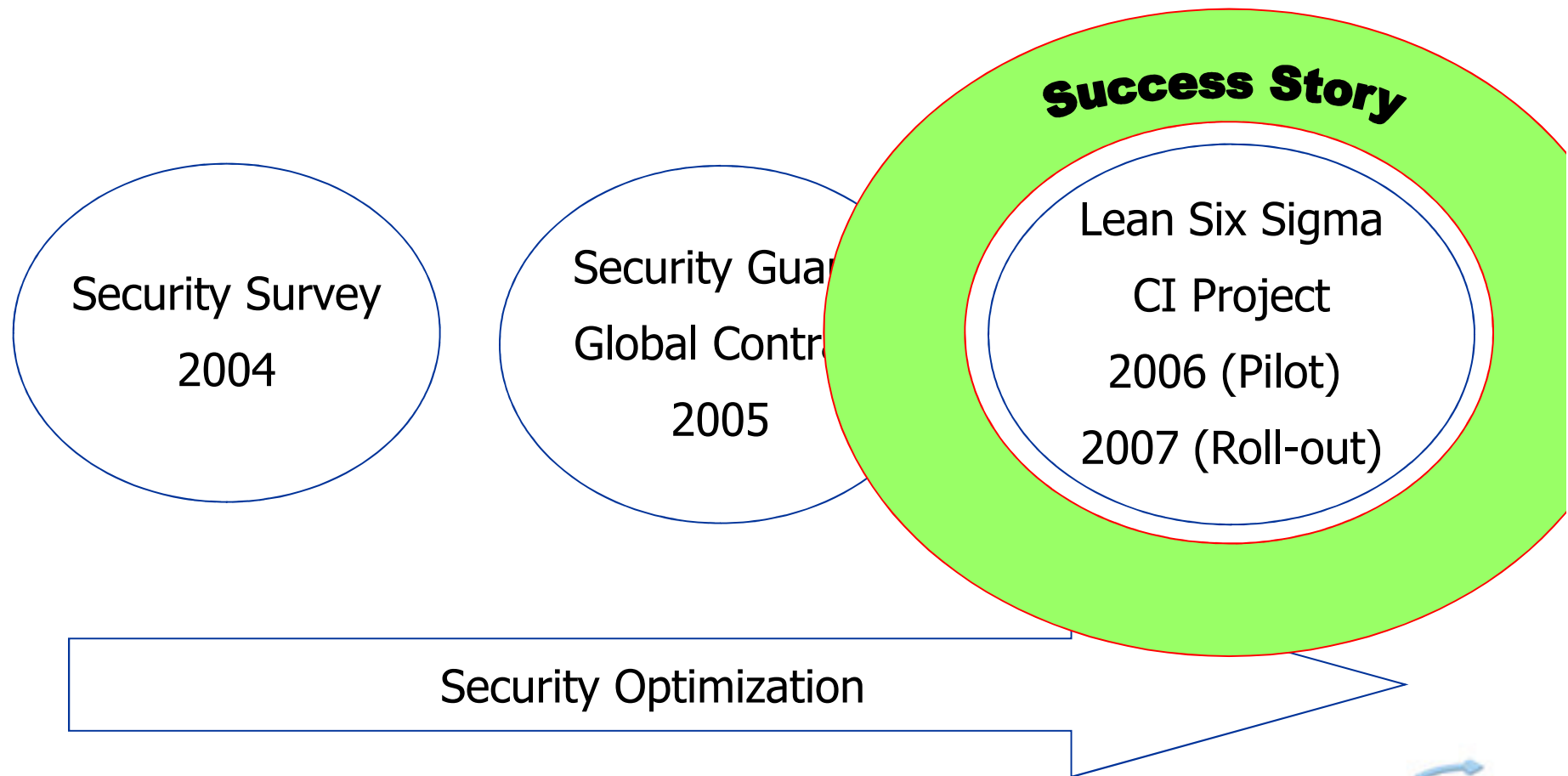


# Global Security Project



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# Alcan Global Security Project (Pechiney Integration)





# CI at Alcan



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# CI: To better execute Alcan's business strategy



*"Continuous Improvement will enable us to better execute our business strategy. This is one of the biggest investments in our people that we ever made.*

*Offering a common toolbox to meet your individual and team objectives, it will empower you as you will benefit from training techniques, sharing of best practices and knowledge transfer".*

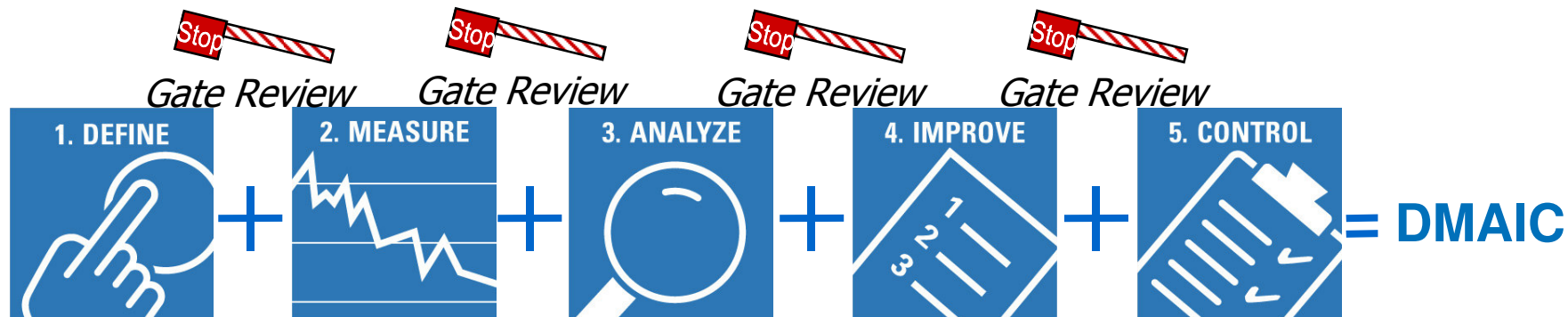
Travis Engen, CEO, 2003

CI Strategy 2010:

- ◆ Green Belt and Black Belt at Senior Level
- ◆ Total 0,7% of BB : approximately 420 people trained
- ◆ Total 2-3% of GB: approximately 1800 people trained



# Alcan CI is the integration of two approaches



### Lean Speed+Low Cost

- ◆ **Goal** – Reduce waste and increase process speed
- ◆ **Focus** – Identify non-value-added steps and causes of delay
- ◆ **Bias** – Quick wins and Kaizen events

### Six Sigma Customer+Quality

- ◆ **Goal** – Improve performance on critical criteria for customers
- ◆ **Focus** – Use DMAIC with other tools to eliminate variation
- ◆ **Method** – Broader management engagement, 1% dedicated as Champions and Black Belts



# CI essential steps



- Project selection (Project Charter)
- Team selection
- Team launch
- Sponsor = Stakeholder
- Gate reviews every phase to obtain the GO!
- CI Tool Box
- FOCUS, FOCUS, FOCUS... stick to the process!
- Celebrate success!!





# The Success Story



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# Opportunity (Project Charter)



- ◆ Alcan spends over 7.5 million US\$/yearly (2003 survey results) for External Security Guard Services, in more than 70 facilities in 23 countries.
- ◆ With an earlier CI project we reduced cost of security services by 40% with an annual savings of 132K while improving the service level.
- ◆ Roll-out this methodology to other Alcan facilities with external security guards in order to optimize security services across the company.
- ◆ **Mandate:** Upgrade effectiveness of the external security services while reducing aggregate Alcan monthly cost of external security services by 20%.



# Results



- ◆ 51% of Alcan sites (35) increased efficiency
- ◆ 957K USD Recurrent Savings
- ◆ 22,8% of total cost reduction
- ◆ Value Creation of more than 6.5M USD
- ◆ Investment (CAPEX) of 1,1 M.



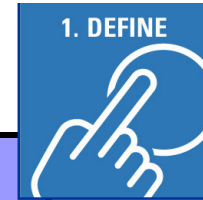


# Define Phase



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# SIPOC (Y = f (X))



Supplier	Input (X)	Process	Output (Y)	Customer
<ul style="list-style-type: none"> <li>◆ Alcan sites with external security guards</li> <li>◆ Corporate Security</li> </ul>	<ul style="list-style-type: none"> <li>◆ Requirements for security</li> <li>◆ Security risks</li> <li>◆ Existing security measures</li> </ul>	<ul style="list-style-type: none"> <li>◆ <b>Delivery of security services by external security guards</b></li> </ul>	<ul style="list-style-type: none"> <li>◆ Aggregate costs of external security guard services</li> <li>◆ Effectiveness of external security guard services</li> </ul>	<ul style="list-style-type: none"> <li>◆ Plant managers</li> <li>◆ Alcan personnel, visitors and contractors</li> <li>◆ Corporate Security</li> </ul>

Metrics		
Input (impact on Y)	Process	Output
<ul style="list-style-type: none"> <li>x = # of sites with external security guards (to be validated in define phase)</li> <li>x = Opportunity for improvement</li> <li>x = Cost of security recommendations</li> <li>x = # of sites using Procurement Master Service Agreement for Security Guards</li> <li>x = Number of Guards</li> <li>x = Average hourly rate</li> <li>x = Average of hours worked by external security guards</li> <li>x = Security equipment used</li> <li>x = Security risks (Business Profile)</li> <li>x = Security requirements (based on Alcan Security Program)</li> <li>x = Security level (GAP between recommended and current level)</li> <li>x = Security Incidents</li> </ul>	<ul style="list-style-type: none"> <li>X= Security guards background check</li> <li>X = Hours of security guards training</li> <li>X = Qualifications (1st aid, fire, etc.)</li> <li>X = Security guards number of years of experience</li> </ul>	<ul style="list-style-type: none"> <li>Y1 = Aggregate Alcan monthly cost of security services at sites with external security guards.</li> <li>Y2 = Effectiveness of security services at Alcan sites with external security guards.</li> </ul>

# Voice of Customers



Improvements required in terms of security services (response rate: 77% of the sites in the project) :

- ◆ Personnel 25,8% (More training for security guards, Reduce turnover)
- ◆ Security Management 37,6% (improve candidate selection, increase supervision, implement/increase daily checks, reduce number of guards/hours, overall satisfied with the service level)
- ◆ Security equipment 36,6% (increase/improve use of technology (CCTV, alarm system, access control, communication, parking security, etc.)





# Measure Phase



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# Data Collection Plan

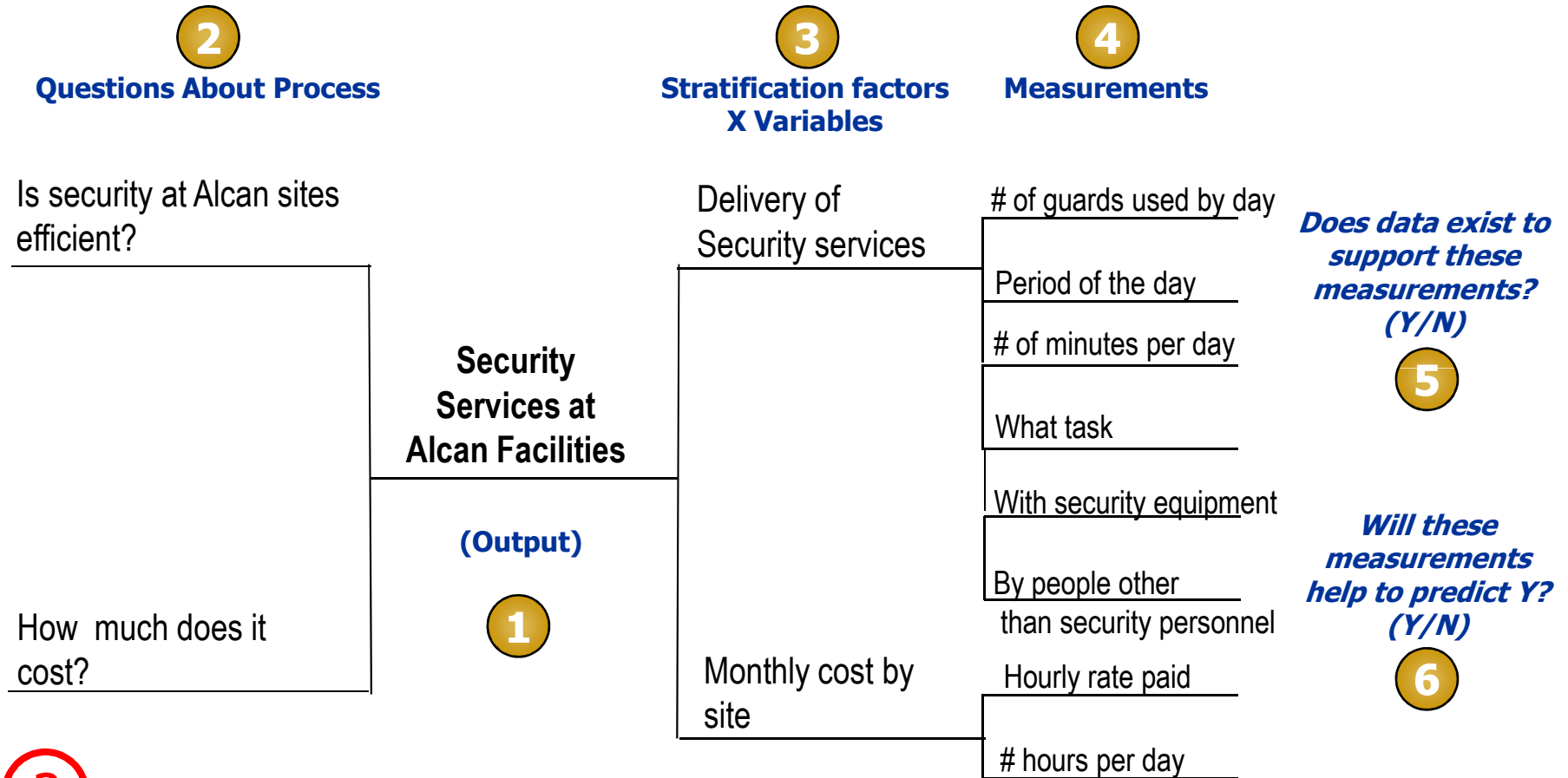
A generic example...

Performance Measure	Operational Definition	Data Source and Location	How Will Data Be Collected	Who Will Collect Data	When Will Data Be Collected	Sample Size	Stratification Factors
Developed earlier in SIPOC	2	3	4	5		6	1
How will data be used?				How will data be displayed?			
<b>Examples:</b> <ul style="list-style-type: none"> <li>◆ Identification of Largest Contributors</li> <li>◆ Identifying if Data is Normally Distributed</li> <li>◆ Identifying Sigma Level and Variation</li> <li>◆ Root Cause Analysis</li> <li>◆ Correlation Analysis</li> </ul>				<b>Examples:</b> <ul style="list-style-type: none"> <li>◆ Pareto Chart</li> <li>◆ Histogram</li> <li>◆ Control Chart</li> <li>◆ Scatter Diagrams</li> </ul>			

Let's see how a data collection plan is developed...



# Stratification Factors 1



2

*Critical Xs = What Xs have the biggest impact on my quality (Y1) and my cost (Y2)*



# Data Collection Plan



Data Collection Plan							
Performance Measure	Operational Definition	Data Source	How will the data be collected	By whom	When	sample size	stratification factor
# of guards used by day	# guards per 24h	Sites	Data sheet	Security Managers	Measure Phase	35 sites	Delivery of security services
Period of the day	day, evening, night, w-e o	Sites	Data sheet	Security Managers	Measure Phase	35 sites	Delivery of security services
# minutes per day	# minutes of security per 2	Sites	Data sheet	Security Managers	Measure Phase	35 sites	Delivery of security services
What Task	duties of security guards	Sites	Data Sheet	Security Managers	Measure Phase	35 sites	Delivery of security services
is security equipment use	list of security equipment	Sites	Data sheet	Security Managers	Measure Phase	35 sites	Delivery of security services
By other people other than	not security personnel	Sites	Data sheet	Security Managers	Measure Phase	35 sites	Delivery of security services
Hourly rate paid	USD hourly rate	Sites	E-mail	Security Managers	Define Phase	90 sites	Cost of security services
# hours per day	# of hours per 24h	Sites	E-mail	Security Managers	Define Phase	90 sites	Cost of security services
	②	③	④	⑤		⑥	



# Who Will Collect the Data?



## Be sure they...

- ◆ Give input during the check sheet design / validation
- ◆ Understand operational definitions
- ◆ Understand how data will be tabulated
  - Helps them see the consequences of changing
- ◆ Have any necessary process knowledge
- ◆ Have adequate training and practice
- ◆ Will remain unbiased



# Data Collection Sheet (1/2)



External Security Guard Services Evaluation						
General Information						
Date:						
Alcan Site:						
Alcan resource managing this contract:						
External Security Guard Supplier:						
Supplier contact name, position and phone number:						
Monthly cost (US\$):						
Contract end date:						
Master Service Agreement Implemented						
Security Manager Completing the Evaluation						
Plan of the site/Pictures obtained						
Business Security Profile						
Security Costs						
Personnel	Day (8h - 16h)	Evening (16h - 12h)	Night (12h - 8h)	Week-end	Holiday	
Number of External Security Guards						
Number of Alcan personnel performing security duties						
	Security chief	Shift Supervisor	Guard	Patrol Guard	Alcan Personnel (performing security duties)	Other
Hourly rate in USD\$						
Equipment	Used Yes/No	Annual Maintenance fee	Annual Investment Planned			
Access Control						
Security Alarm System						
Fire Alarm System						
CCTV						
Recording device						
Security Communication (walkie-talkie, cell phone, etc.)						
Perimeter Protection						







# Analysis Phase



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# Analysis – Critical Xs



- ◆ Surveillance standby is the security task requiring the most time (44%) and is not a value add task
- ◆ Week-end shift efficiency is very low (14%)
- ◆ Evening/night shift efficiency at 50%
- ◆ Other non security duties should be reviewed (14% of the time)
- ◆ No CCTV monitoring

Pareto analysis  
80/20

76%

Security Duties							
	guard day (6h-18h) 2 FTEs	guard evening/night (18h-6h) 2 FTEs	Total per day (24h)	guard w-e (48h) holiday 2 FTEs	Total w-e (48h)	Total hours per week	% of hours per week
	# of hours						
Access Control (Visitors, employees, contractors)	5	0,5	5,5	0,5	0,5	28	10%
Alarm System Response and Monitoring	1	1,5	2,5		0	12,5	4%
CCTV Monitoring			0		0	0	0%
Patrol and Security Inspections		8	8	12	12	52	18%
<b>Surveillance/standby</b>	2	16	18	38	38	128	44%
Emergency Intervention (Security, Fire, Medical)	1	1	2	1	1	11	4%
Supervision, Replacement (lunch, breaks)						0	0%
Communication, Reporting (Daily and special events reports)	2	1	3		0	15	5%
Other security duties	1		1		0	5	2%
Other non security duties	8		8		0	40	14%
<b>Total hours of security duties</b>	<b>20</b>	<b>28</b>	<b>48</b>	<b>51,5</b>	<b>51,5</b>	<b>291,5</b>	
<b>Total available hours</b>	<b>24</b>	<b>24</b>	<b>48</b>	<b>96</b>	<b>96</b>	<b>336</b>	
<b>% security hours vs available hours</b>	<b>83%</b>	<b>117%</b>	<b>100%</b>	<b>54%</b>	<b>54%</b>	<b>87%</b>	
<b>Total hours of security duties (without standby time)</b>	<b>18</b>	<b>12</b>	<b>30</b>	<b>13,5</b>		<b>163,5</b>	
<b>% security hours vs available hours (without standby time)</b>	<b>75%</b>	<b>50%</b>	<b>63%</b>	<b>14%</b>		<b>49%</b>	

# Critical X Analysis



Example							
Analysis	Improve	Improve	Control	Control	Control	Improve	Improve
Critical X	Potential Solutions	Actions Plan	Quality Impact	Potential Savings	Investment required	Who	When
Security Level	Security Evaluation	Implement SAV Recommendations	Increase Security Level		121K	XYZ	Oct
Hourly rate	renegotiate contract with Graber, no procurement effort was done yet for a volume negotiation (phase 1)	choose companies to 2nd phase, facilities visit, proposals, choose supplier, negotiate contract,				XYZ	Q2 2007
Number of guards	Reduce guards (2)	Day shift (L-V 4 guards), Night Shift (L-V, w-e, hol. 3 guards)		90k		XYZ	Q4 2007
	Install CCTV with infra-red perimeter detection system and other devices	Install CCTV(12) with infra-red perimeter detection system and other devices, ensure lighting is adequate for CCTV needs.				XYZ	Oct
Monthly fire extinguisher inspection	Cancel monthly external contract assign task internally to foot patrol guard or fire brigade personnel. Maintain annual inspection by external company.		Better knowledge of fire extinguisher localisation by security personnel and/or fire brigade.				Q4 2007
Low Efficiency of the security services (security incidents)	Change Security Company, Change Contract manager (external), implement security policies and directives.	Implement SAV recommendations	Security of the site improvement and follow-up.				Q4
Standby time (42%)	Reduce guards, reassign security tasks						Q4
Service level of supplier is mediocre	New supplier						Q4
	Master service agreement						Q4
	Improve service						Q4
Access Control	Implement automated gates for access control outside rush period (after and before shifts)	Implement SAV recommendations	Better use of standby time, more security for parking lot.	Reduce personnel	TBD	XYZ	Oct
	CCTV surveillance of access					XYZ	Oct
Lighting around perimeter is not sufficient	increase lighting	Implement SAV recommendations				XYZ	Oct



# Improve Phase



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# Improvements



For the 35 sites in the project:

- ◆ 51% increased their efficiency
- ◆ 43% renegotiated their security guard contract
- ◆ 34% reduced the number of hours for security guards
- ◆ 29% implemented new CCTV equipment
- ◆ 22,8% cost reduction from total cost
- ◆ Status quo maintained for 29% of the sites.





# Control Phase



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# Control Plan

- ◆ Is delivered to transfer knowledge to the process owners (summary of project)
- ◆ Contains performance indicators to sustain the gains (Quality/Costs)
- ◆ Assists in highlighting opportunities for further improvement activities
- ◆ Is a living document
- ◆ Is interesting and easy to understand – use pictures and colors
- ◆ Is signed by the process owner
- ◆ Is validated during the validate phase (6-12 months after the control phase)



# Performance Indicators 1 of 2



Performance Indicators of Security Guard Services			
Security Duties Performed	Time spent per week (7 days)		Comments/ Diagram
	Before	After	
Access Control (Visitors, employees, contractors)	28	28	
Alarm System Response and Monitoring	12,5	12,5	
CCTV Monitoring	0	30	validate after
Patrol and Security Inspections	52	52	
Surveillance/standby	128	56	less standby time
Emergency Intervention (Security, Fire, Medical)	11	11	
Supervision, Replacement (lunch, breaks)	0	0	
Communication, Reporting (Daily and special events reports)	15	15	
Other security duties	5	5	
Other non security duties	40	40	
Total hours of security duties without standby	163,5	193,5	
Total available hours	336	228	security guard reduce to one only on night and w-e
% security hours vs available hours	49%	85%	
<b>Security Equipment</b>			
	Used Yes/No		
	Before	After	
Access Control	yes	yes	
Security Alarm System			
Fire Alarm System	partial	complete	improvement of the fire detection system
CCTV (Videosurveillance)	no	yes	
Recording device (enregistrement)	no	yes	
Security Communication (walkie-talkie, cell phone, etc.)			
Perimeter Protection	partial	complete	
<b>Security Cost (Personnel)</b>			
	\$ USD		
	Before	After	
Number hours per month			
Hourly rate (\$US)			
Monthly Cost (\$ US)	25K euros	12,5 K euros	savings of 150K Euros, starting in Q3 2008
<b>Security Cost (Equipment)</b>			
	\$ USD		
	Before	After	
Maintenance fee per month (\$ US)			
Investment (CAPEX) fee per month (\$ US)		300 K Euros	Q1 2008





# Performance Indicators

Security Data (Quality)	\$ USD		
	Before	After	
<b>Access Control</b>			
Efficiency of access control (visitors, employees, vehicles) %			anti-pass back
Time to register one visitor (in minutes)			
Time dedicated for EHS training at reception (in minutes)			
Time to control one vehicle (in minutes)			
<b>Patrol/Security Inspections</b>			
# of patrol/security inspections	2	2	
# of checkpoints per patrol/security inspection (extérieur)	7	7	
# of checkpoints per patrol/security inspection (intérieur)	13	13	
<b>Alarm system Response and Monitoring</b>			
<b>Intrusion Detection Alarm</b>			
# of alarms			
average Response time for on-site external security guards (in minutes)	3 min.	30 sec.	caméras validation de l'alarme
average Response time from outside patrol (in minutes)	non	5 min.	Centr'Alp
<b>Technical Alarm (ESS)</b>			
# of alarms			
average Response time for on-site external security guards (in minutes)	3 min.	8 min.	voir possibilité mettre caméras???? Four, salle informati
average Response time from outside patrol (in minutes)	non	5 min	Centr'Alp
<b>four (risque critique)</b>			
average Response time for on-site external security guards (in minutes)	3 min.	30 sec.	mettre une caméra
average Response time from outside patrol (in minutes)	non	5 min.	Centr'Alp
<b>gaz (risque moyen)</b>			
average Response time for on-site external security guards (in minutes)	3 min.	8 min.	ok comme performance (à valider avec ESS)
average Response time from outside patrol (in minutes)	non	5 min.	Centr'Alp
<b>Fire Detection Alarm</b>			
# of alarms			
average Response time for on-site external security guards (in minutes)	3 min.	30 sec./ 8min	avec caméras 30 sec. Si non 8 min. (cibler les endroits à r
average Response time from outside patrol (in minutes)	non	5 min	Centr'Alp







# Conclusion



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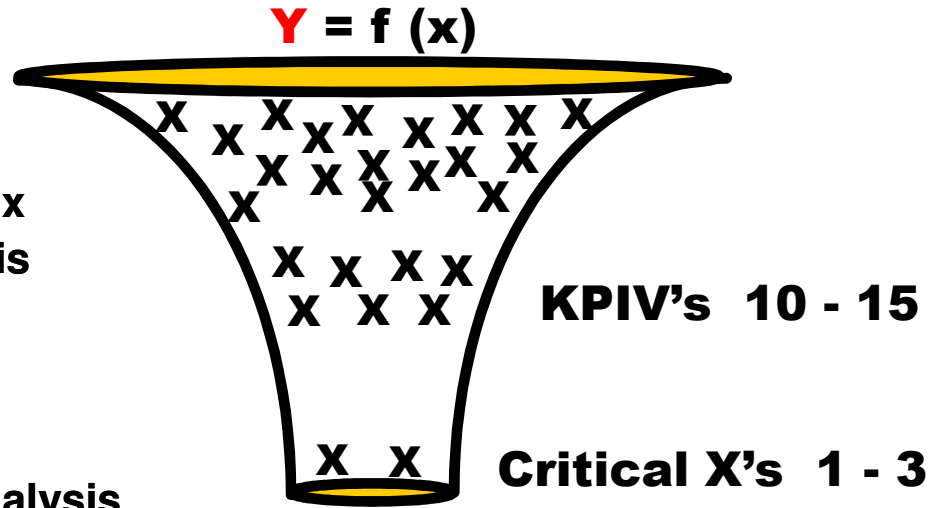
# Define

## Develop Charter and Frame Project



# Measure

- Process Map
- Cause and Effects Matrix
- Basic Statistical Analysis
- FMEA

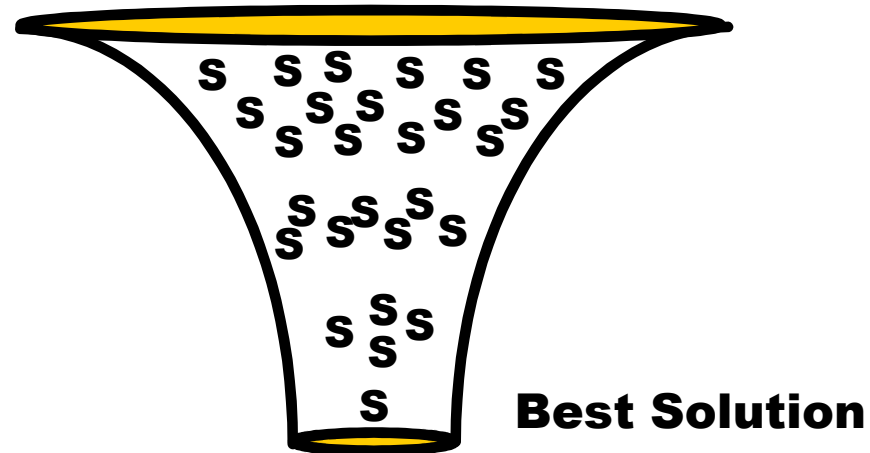


# Analyze

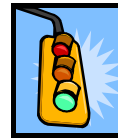
- FMEA
- Advanced Statistical Analysis

# Improve

- Brainstorming
- Show Stoppers
- Business Culture
- Force Field
- Pairwise
- Solution Matrix



Implement



# Control



**Sustain the Gain**



# Security Optimisation Strategy



- ◆ Global Security Survey
- ◆ Project Charter (opportunity, scope)
- ◆ Pilot project with DMAIC (1 sites - 12 months)
- ◆ Roll-out of the strategy (35 sites - 24 months)
- ◆ Security process (SIPOC)
- ◆ DMAIC phases using CI tools
- ◆ Results:
  - 51% of sites increased efficiency
  - 957K USD savings
  - 22,8% of total costs reduction
- ◆ Patience! Focus!





## Questions?

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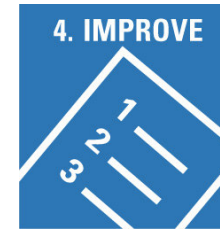


# Back-up slides



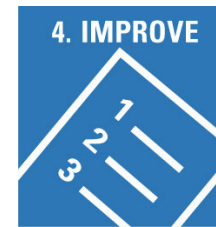
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# Potential Solutions 1/2



External Security Guards Optimization Alternatives	
Challenge	Potential Solutions
<b>Task/Time</b>	
Time spent on security task during a shift is very low, high standby time	Evaluate possibility to reduce personnel
Security guard working alone	Use PDA and panic button to assist security personnel working alone
Non security duties take a lot of time (ex: mail distribution, phone dispatch, truck weighting, etc.)	Evaluate duty re-assignment in the facility or value add impact for security function.
Guards are involve in Emergency Response and Fire intervention	Make sure training is adequate
Duplication of duties, overlapping	Task assignement to review, evaluate possibility to reduce personnel, change schedule
High peak period	Evaluate possibility to change shift schedule (longer shift from 8h to 12h, shift from 7h-15h and some from 8h-16h)
Fire Arms	Reevaluate the responsibility and the needs of utilization of fire arms at work. If maintained, ensure appropriate and timely training in respect to regulations
Quality of service To be improved	Change security company, Change security company contract manager, Improve quality of services with training, implement security policies and directives.
Security done by two different compagnies in the same location	Negotiate agreement with other customer to create synergy and combine tow positions. Try to create a win-win situation for both.
Reception done by Internal personnel with high cost	Reception contracted out to security firm, Eliminate Reception duty, empowering employees to apply access control guidelines
Too much time spent on security patrol	Focus guard patrols on critical areas, use patrol checkpoint (checklist or system)

# Potential Solutions 2/2



External Security Guards Optimization Alternatives	
Challenge	Potential Solutions
<b>Cost/ Contract</b>	
Security guard contract to be renewed	Obtain quotation from two preferred suppliers (GROUP4 and Securitas), Apply Master Service Agreement to standardize and implement CI clause - section 8.
Security Guard Contract not with preferred supplier	Apply Master Service Agreement to standardize and implement CI clause - section 8.
Hourly rate is high	Renegotiate, Obtain quotation from two preferred suppliers (GROUP\$ and Securitas), Apply Master Service Agreement to standardize and implement CI clause - section 8.
Master Service Agreement access	In Procurement database or with Corporate security
<b>System</b>	
Perimeter protection is weak	Protect the perimeter wall by infra red system, Protect the fence with an alarm cable.
Access control is weak, need to maintain 100% accountability	Evaluate access control automated system, implement turnstiles and readers, evaluate union issues when applicable, CCTV surveillance of access
No CCTV monitoring	Set up CCV monitor.
Additional security needed	Add new perimeter cameras with motion detectors
Security Equipment not in regulation (Old control panel , not in the right area, etc.)	Evaluate GAPS with regulations and develop an action plan to fill the GAPS.
No key control	Install a key control system
Monthly fire extinguisher inspection	Cancel monthly external contract assign task internally to foot patrol guard or fire brigade personnel. Maintain annual inspection by external company.
Lighting around perimeter is not sufficient	increase lighting
Phone reception	Identify the phone technology to answer the phone calls, or a person inside the plant, or a specialised firm for answering and distributing the phone calls
Increases ability of management to monitor the quantity and quality of patrols by contract guards.	Implement a patrol check point system
Communication needed between guards and control center	Use radios system, walikie-talkie, panic button, PDA, etc.