

Rio Tinto Alcan

Operational excellence at Rio Tinto Alcan Alma plant

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Presented by
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Content

Alma plant presentation

Context : improve operations

Performance indicators

Tools for follow up

Results

Conclusion

Next steps

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Alma plant presentation

Context : Improve operation

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Tools for follow up

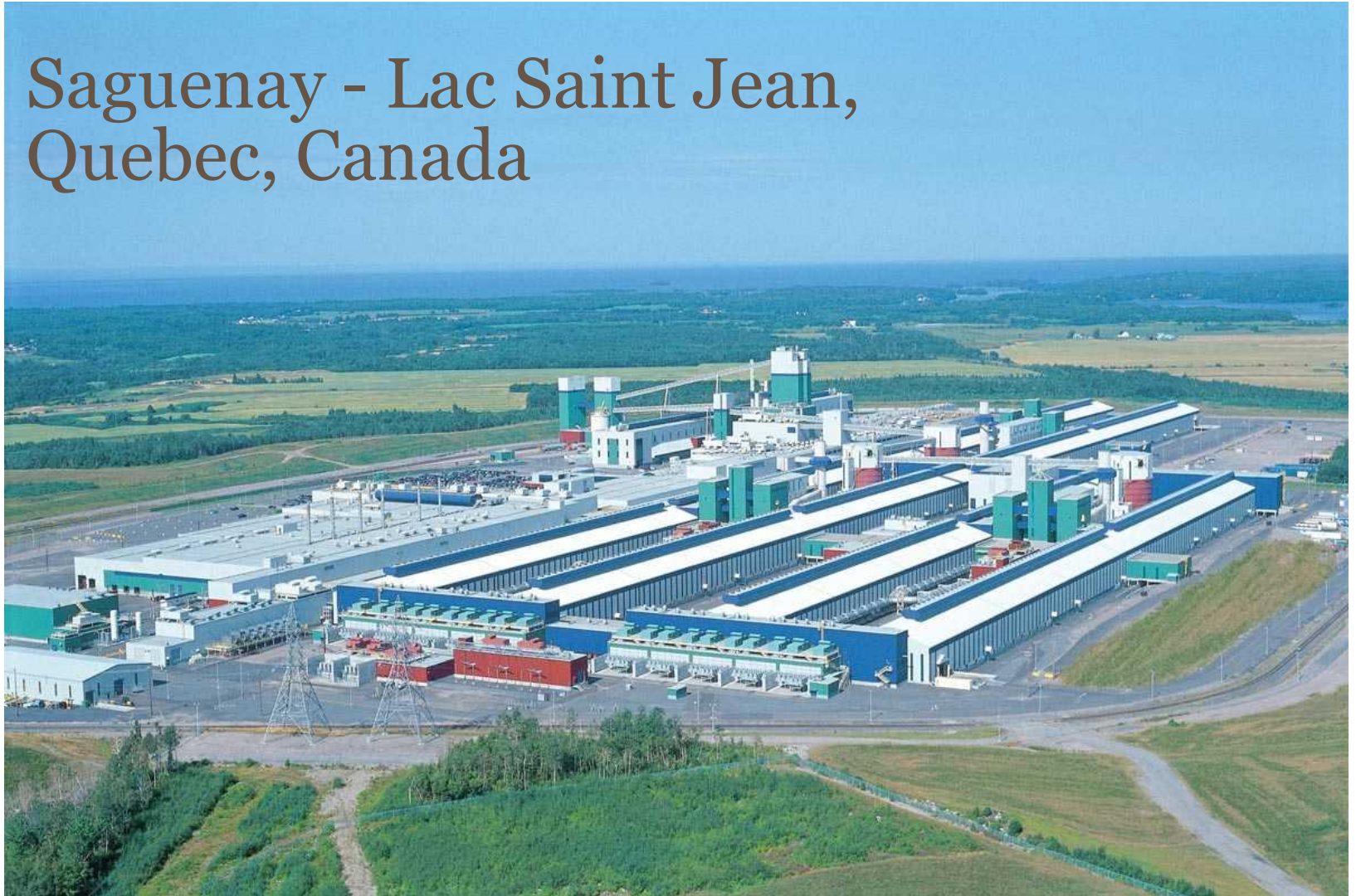
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Context : Alma plant

Saguenay - Lac Saint Jean,
Quebec, Canada



Context : Alma plant



- Start-up in 2000
- 432 pots
- 425 ktpy production
- Foundry ingots, cable, molten metal
- 180 ktpy anode plant
- AP30 technology
- 840 employees
- Hydro power
- 100 % RTA ownership

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Alma plant presentation



Context : Improve operation

Performance indicators

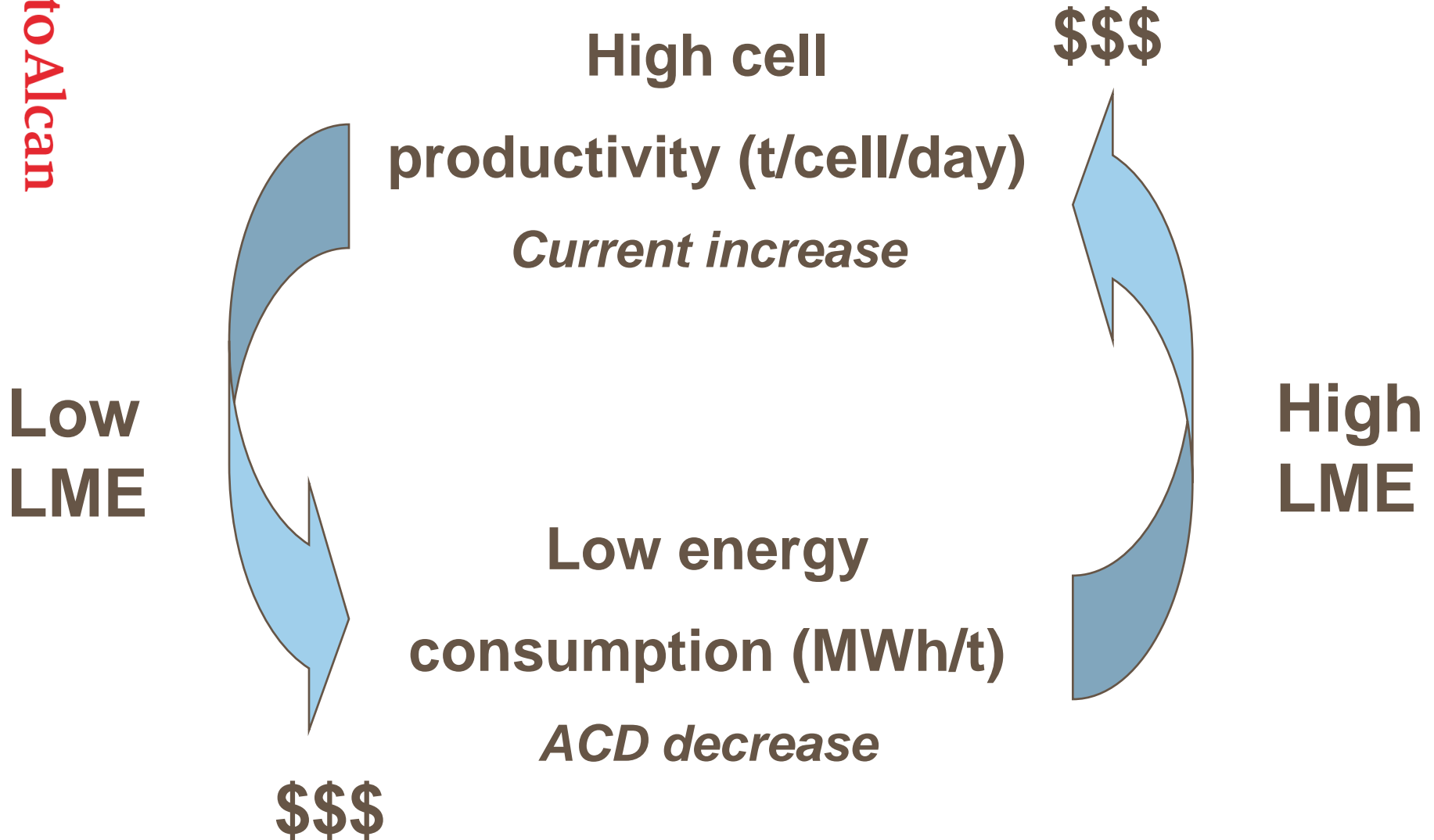
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Context : Alma objectives



Context : Alma constraints

Amperage increase and/or ACD decrease

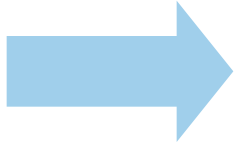
BUT

Good current efficiency and no environmental health and safety impact

anode effect frequency / duration

fluoride and dust emissions

net carbon consumption



Need to improve performance

Context : improve performance

Two ways to improve performance :

Work on technology

Improve cell design, improve cell process control, optimize process parameters,...

Work on operation

Anode change and metal tapping are the two main operations that affect cell performance

Alma approach :

Since 2006 Alma plant has put some emphasis on operation by the definition of individual performance indicators that are closely followed up by the plant management

- 1) Define individual performance indicators**
- 2) Develop tools for management follow up**
- 3) Compile results and give feedback**

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Context : Improve operation



Performance indicators

Tools for follow up

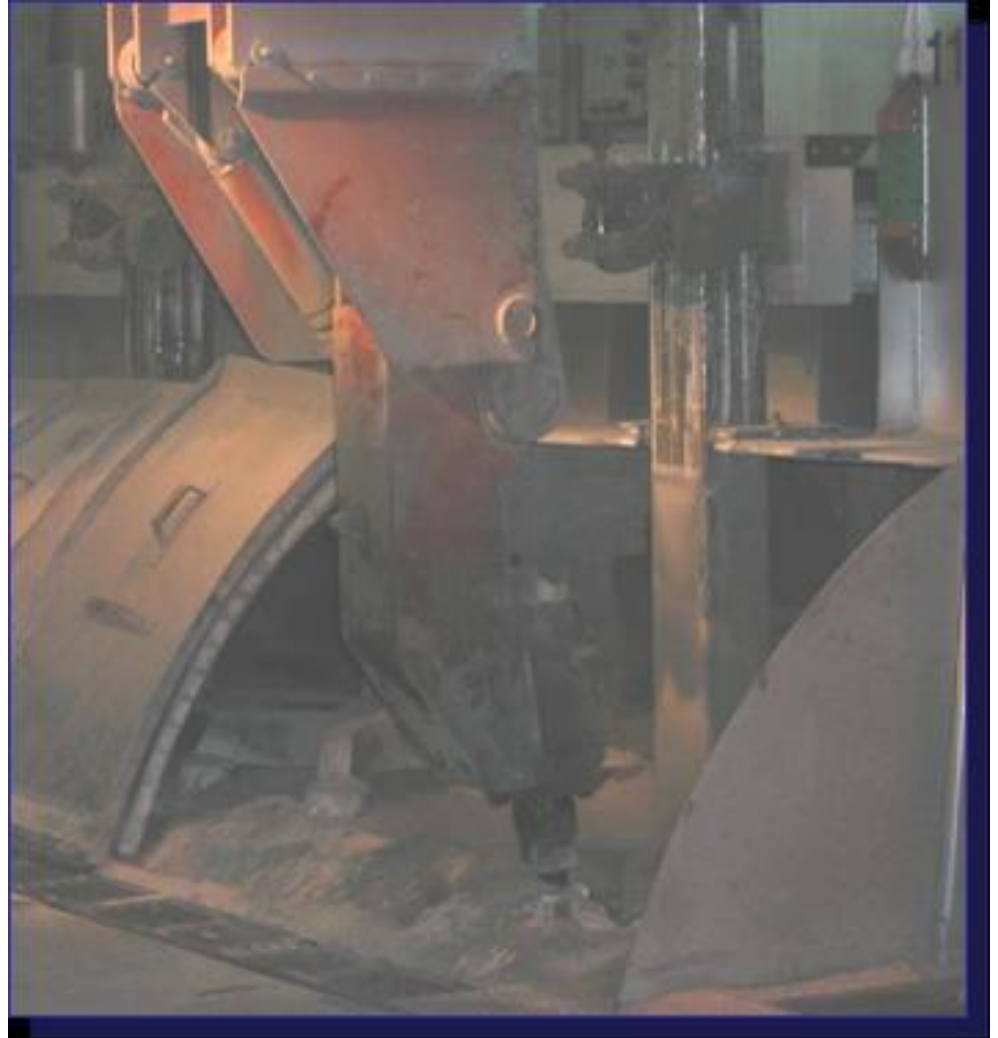
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Performance indicators : anode change

- Number of times the crust breaker is used



Performance indicators : anode change

- Number of crust grabs per anode.



Performance indicators : anode change

- Anode gauging performance



Performance indicators : anode change



- Covers delays
- Covers quality

Performance indicators : metal tapping

- Tapping holes quality



Performance indicators : metal tapping

- Tapped bath in metal



Performance indicators : open hoods



- Number of open hoods per cell
- Number of cells with open hoods
- Hoods sealing quality

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Tools for follow up : objectives

Know the “real” operative mode

Target individuals (good or bad)

React quickly

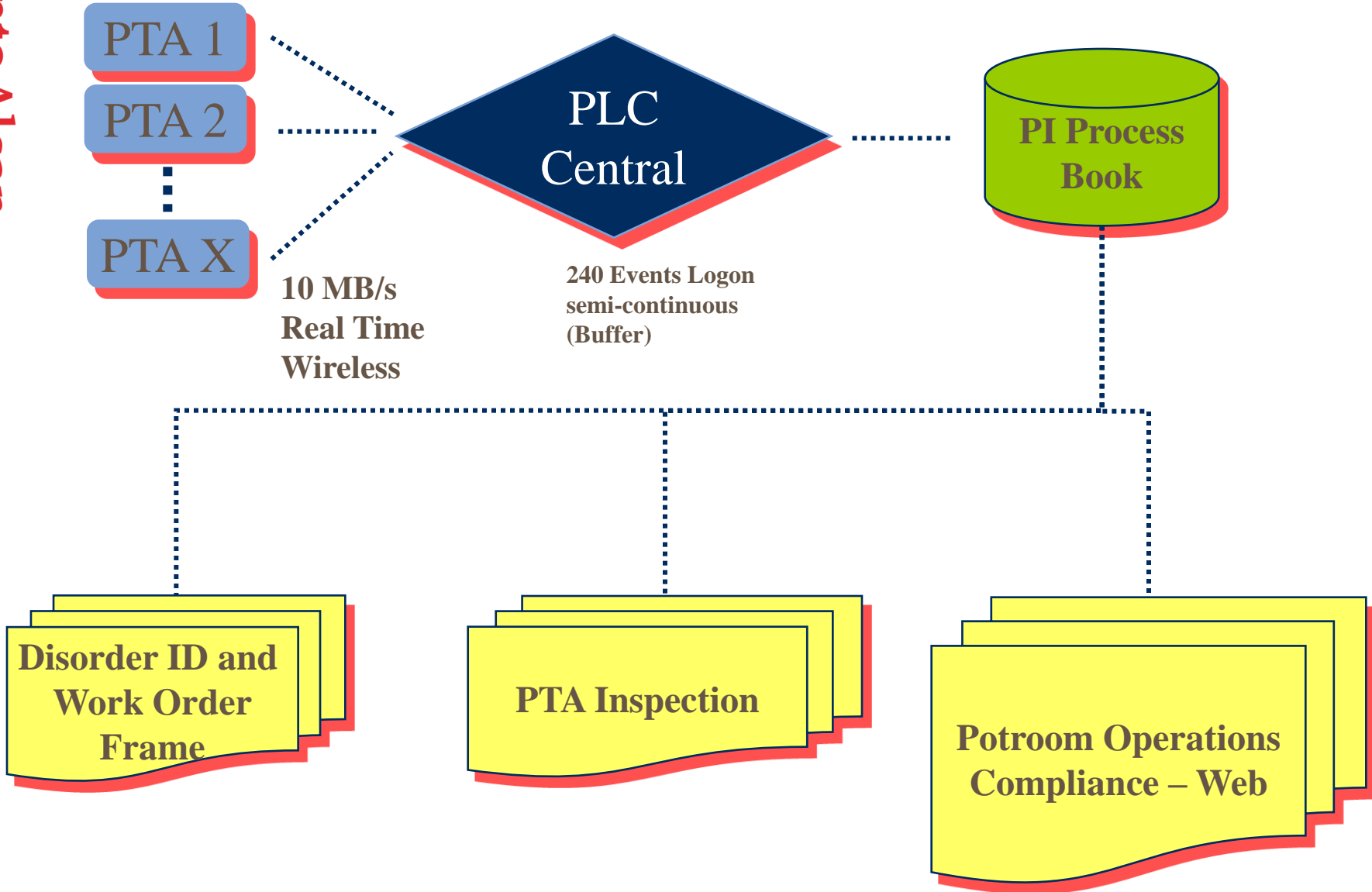
Give a chance to the operators to see themselves,
compare themselves, discussions between
themselves

Demonstrate the tight follow-up by the direction

Tools for follow up :

- Regular night/day inspections by management (supervisor, technical staff, superintendant)
- Pot tending machine (PTM) data collection

Tools for follow up : PTM data collection



Tools for follow up : PTM data collection

Famille Tremblay Famille Bouchard Famille Girard Poste

Dernière mise à jour: 2008-09-3 à 7:13

Real time info

Secteur:

Poste:

Début du Poste : 2008-09-2 à 7:00

Fin du Poste : 2008-09-2 à 18:59

Avancement d'anode

Anode setting performance

Avancement/Nombre d'anodes planifiées	3/18	16.7 %
Nombre de coups de pelle/Anode (moyenne)	1.0	
Nombre de coups de piqueur/Anode (moyenne)	7.5	
Temps de piquage/Anode (moyenne)	27.5	Secondes
% de conformité du jaugeage automatique		66.7 %

Annage

Tapping performance

Avancement/Nombre de cuves planifiées	8 / 9	88.9 %
Nombre d'activations de la potence	9 / 9	100.0 %

Couverture/Recouverture

Anode covering delay performance

Temps de couverture COV (moyenne)	2.3	Heures
Temps de recouverture REA (moyenne)	18.3	Heures

Dashboard indicator
Red/
Yellow/Green
Pattern

Tools for follow up : PTM data collection

Portail Électrolyse - Détail couverture

Date	Éq.	MSE	Cuve	Anode	Délai
2008-09-02 08:51:58	C	4	2141	8	1.2
2008-09-02 08:54:04	C	4	2142	10	1.1
2008-09-02 08:56:12	C	4	2143	7	1.0
2008-09-02 08:58:18	C	4	2144	4	.9

Report are used for one-on-one meeting with the employees

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Compile results and give feedback

- Results are used to evaluate teams / supervisors performance

Second cover delay

		Tremblay	Moyenne	A	B	C	D	T. éch.	
septembre 2008	87%	T1S	87%	94%	76%	88%	91%	730	
		T2S	90%	85%	92%	94%	89%	764	
		T7S	85%	86%	76%	89%	88%	809	
		T8S	86%	96%	75%	81%	94%	772	
		Moyenne	87%	90%	80%	88%	90%		
	89%	Bouchard			A	B	C	D	
		B3S	89%	91%	92%	85%	92%	806	
		B4S	89%	87%	92%	88%	91%	665	
		B5S	86%	86%	89%	83%	83%	718	
		B6S	90%	95%	89%	94%	82%	735	
	Moyenne	89%	90%	90%	87%	87%			
	85%	Girard			A	B	C	D	
		G1S	87%	81%	85%	87%	94%	839	
		G2S	85%	86%	81%	88%	86%	691	
		G7S	82%	88%	66%	86%	83%	799	
		G8S	85%	90%	83%	84%	82%	714	
Moyenne	85%	86%	79%	86%	86%				
		Moyenne	89%	83%	87%	88%			

Légende >01:10

Vert x > 80

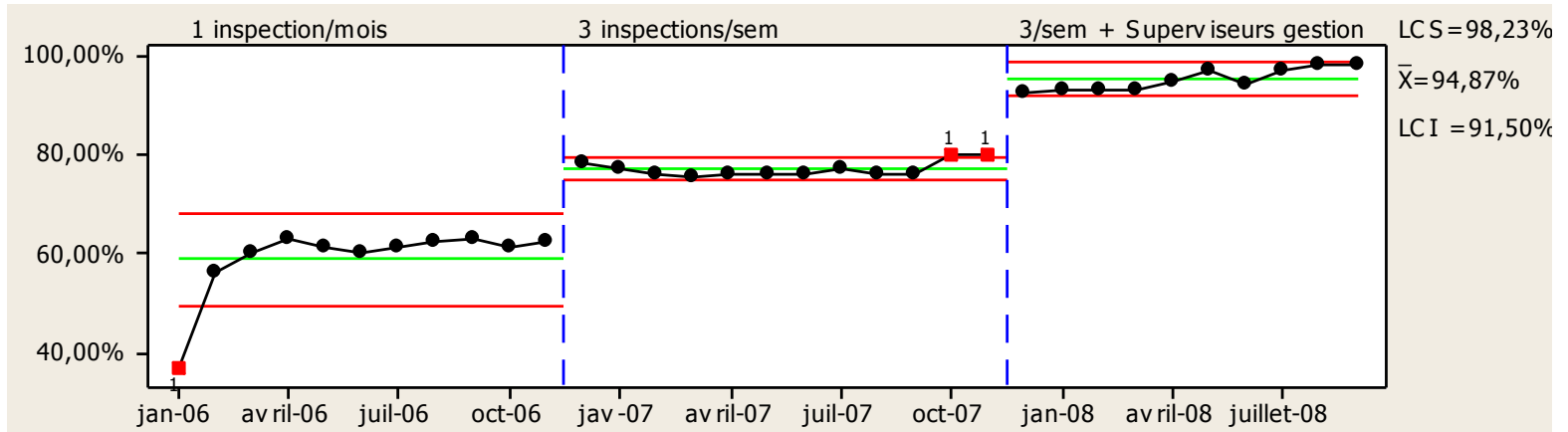
Jaune 80 < x < 70

Rouge 70 < x < 50

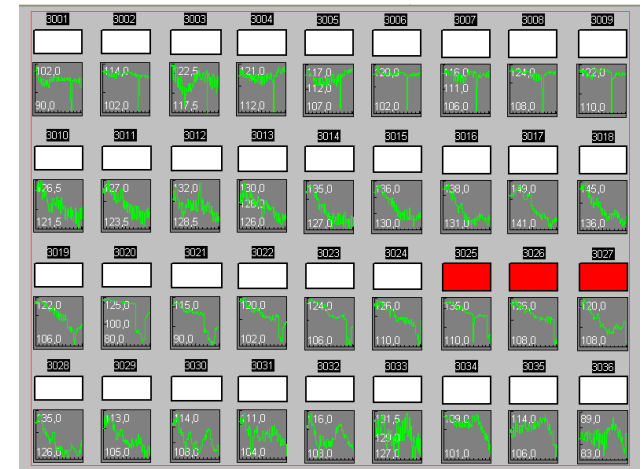
Bleu x < 50

- Tight follow up increases global performance

Performance improvements



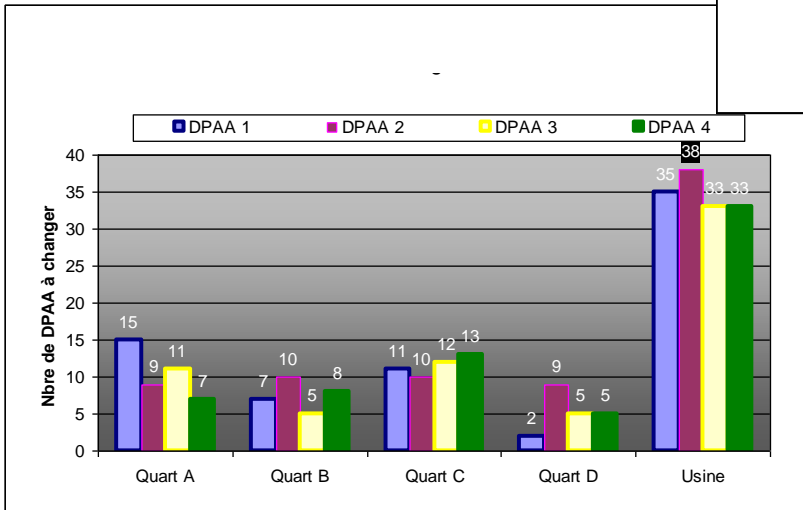
- Number of open hoods per cell
- Number of cells with open hoods



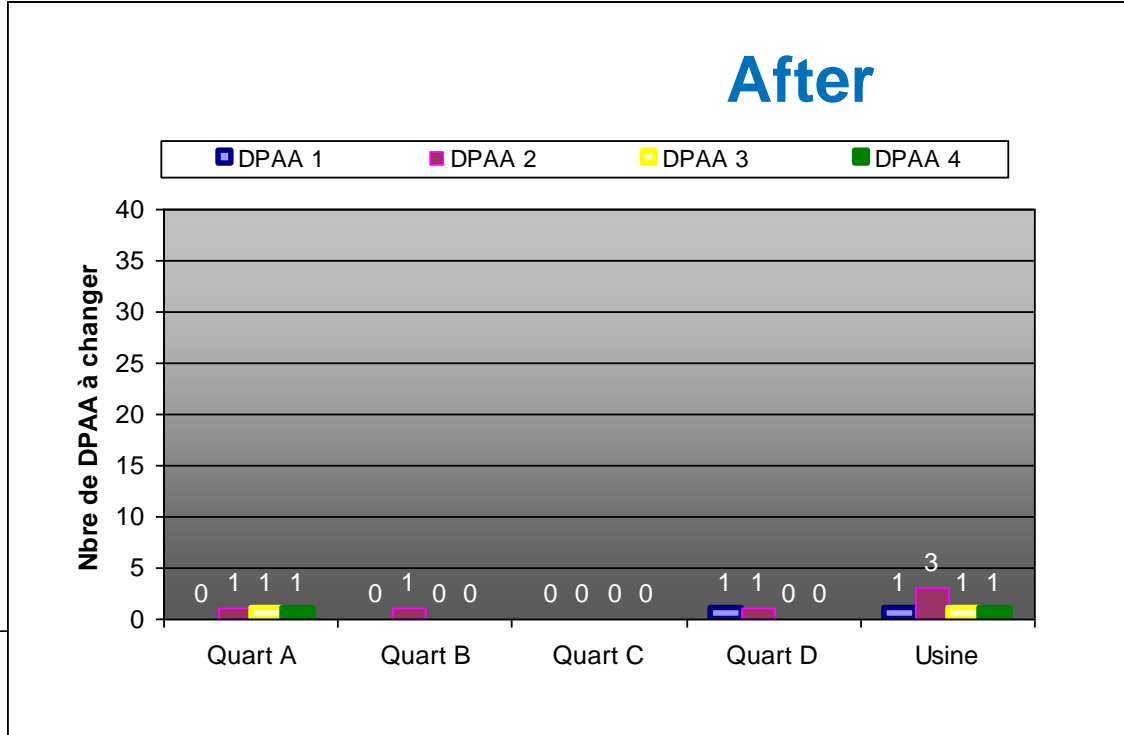
- Next step

Performance improvements

Before



After



Number of crust breaker to be changed

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- In its unionized environment Alma plant has put in place individual performance indicators. These indicators are closely followed up by plant management. This has positive impact on many aspect :
 - Stabilize the operation
 - Make people more responsible

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- Next steps will be to expand these individual performance indicators from the quality of operation to the quality of intervention
 - multiple AE
 - cell stability
- At the end of the day process decisions will be transferred from the technical staff to the operators
 -  Required to face Alma high intensity low energy challenges

Thank you for
attention

Questions ?