OPPORTUNITIES FOR CO_2 REDUCTION & HIGHER EFFICIENCY

Paper 057

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***GM Business Develoment FCT ACTech**

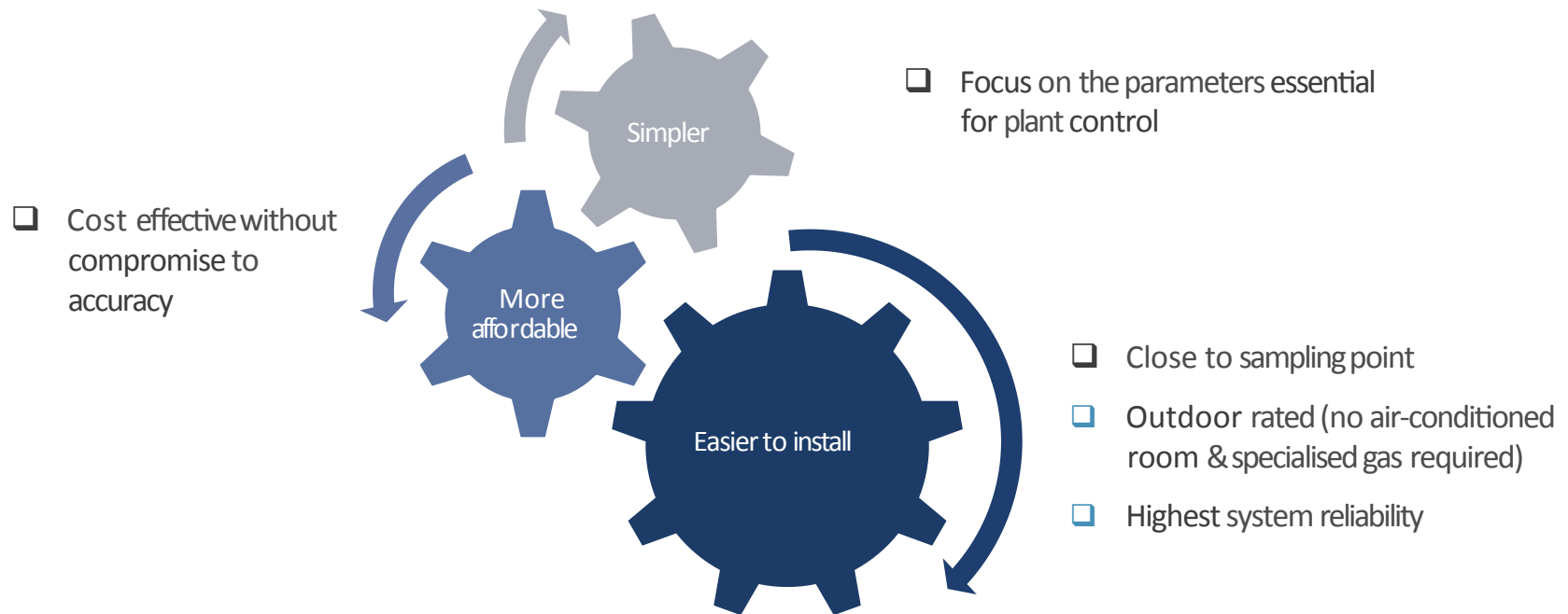****Product Manager & Application Specialist ICON SCIENTIFIC SYSTEMS**

Outline

❑FCT International

❑X-Series Analyser

❑Applications

❑Case Study Raw Meal

❑Summary

FCT International Group Companies

THE NEW GENERATION X-SERIES

Simpler

More affordable

Easier to install

- ❑ Focus on the parameters essential for plant control

- ❑ Cost effective without compromise to accuracy

- ❑ Close to sampling point
- ❑ Outdoor rated (no air-conditioned room & specialised gas required)
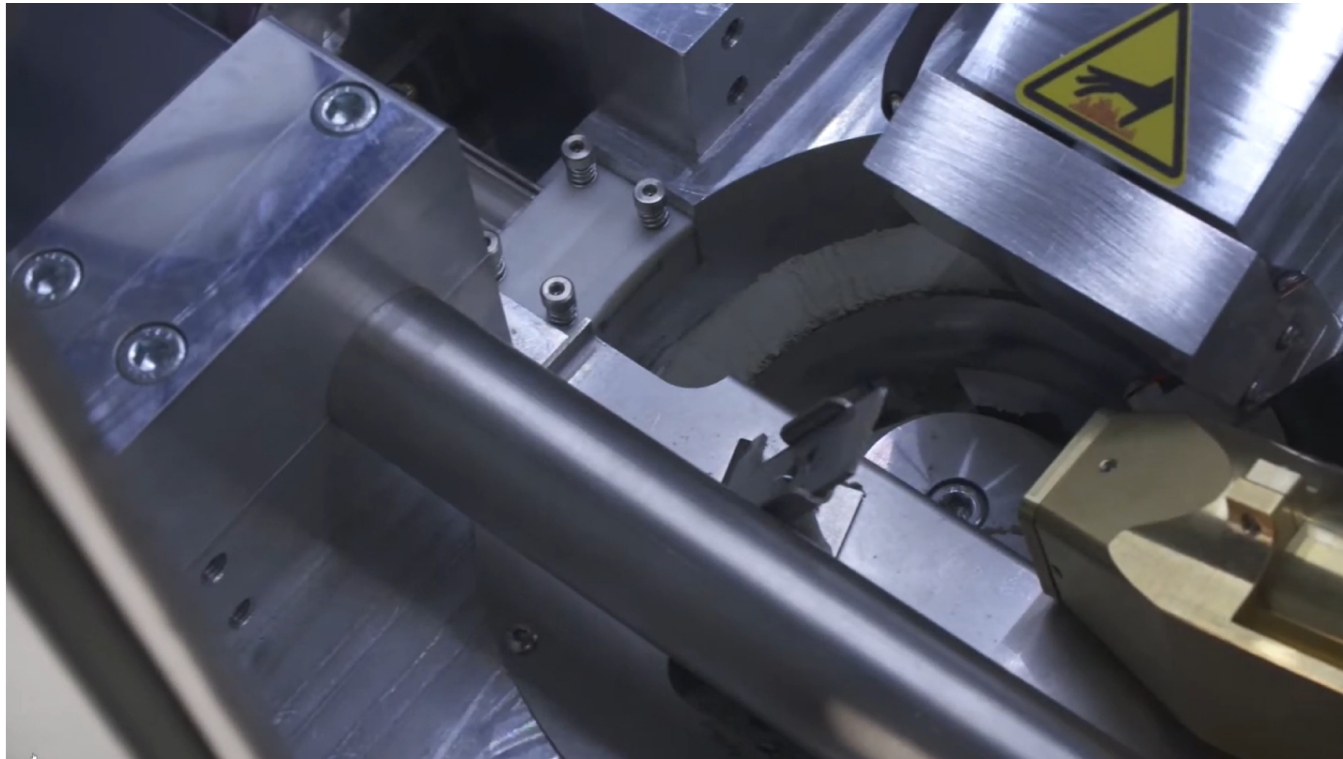- ❑ Highest system reliability
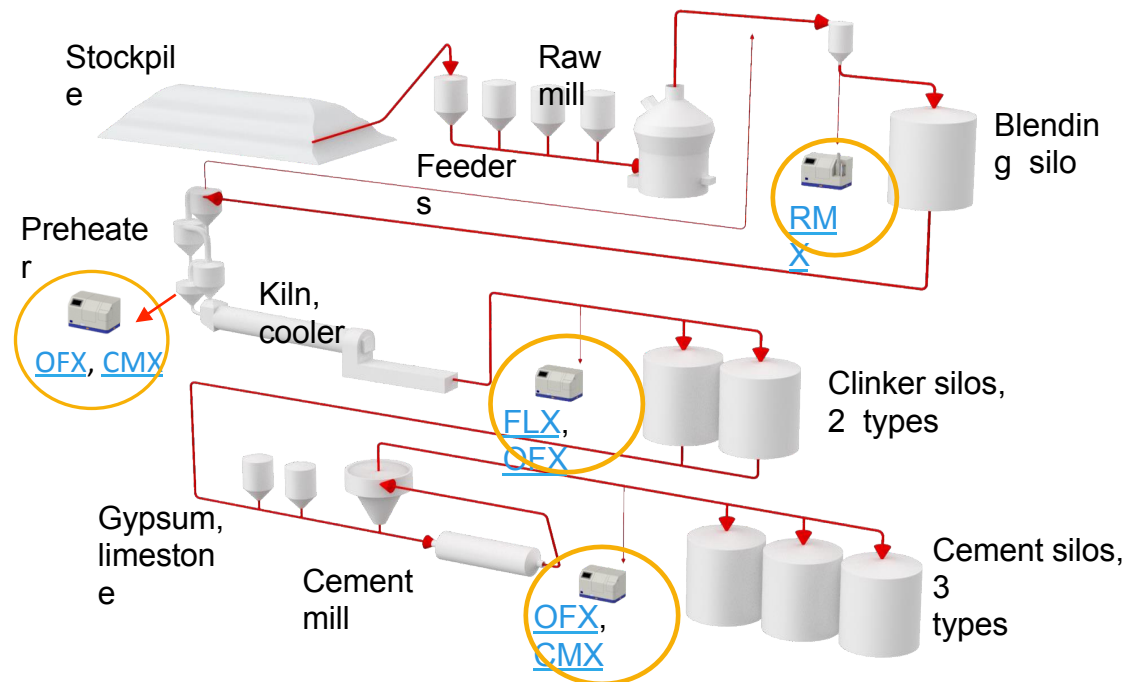
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Common Features to X-Series Analysers

ϒ Sample preparation free

ϒ Ultra-fast batch or continuous operation including full integration/automation

ϒ Coarse or fine material (built in grinder for coarse)

ϒ Turntable sample presentation (continuous sample preparation robotics)

ϒ Automated mixing

ϒ More representative results, updated every 3-10 minutes

ϒ Fixed detectors for outstanding reliability

ϒ Easy installation close to the sample point

ϒ Ruggedized, safe and built to last

ϒ Minimal installation cost

Class X software

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How it works

X-Series Applications

Stockpile

Raw mill

Feeders

Blending silo

RMX

Preheater

OFX, CMX

Kiln, cooler

FLX, OFX

Clinker silos, 2 types

Gypsum, limestone

Cement mill

OFX, CMX

Cement silos, 3 types

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X-Series Applications

FCT Models	Analysis System		Analysis
	XRD	HRTC XRF	
FLX	✓		Free Lime
FLX+	✓		Free Lime, C_3S
OFX	✓	✓	Elemental Analysis (Ca, Si, Al, Fe & S, Mg), Free Lime
OFX+	✓	✓	Elemental Analysis (Ca, Si, Al, Fe & S, Mg), Free Lime, C_3S
RMX		✓	Elemental Analysis and calculated LSF, other moduli, C_3S, C_2S, C_3A, C_4AF
CMX-Gamma	✓		Gypsum, Lime, Alumina, Pozzolan, Fly-Ash and Slag
CMX-Cement	✓	✓	Elemental Analysis (Ca, Si, Al, Fe & S, Mg), Free Lime, C_3S, Gypsum, Pozzolan, Fly-Ash and Slag

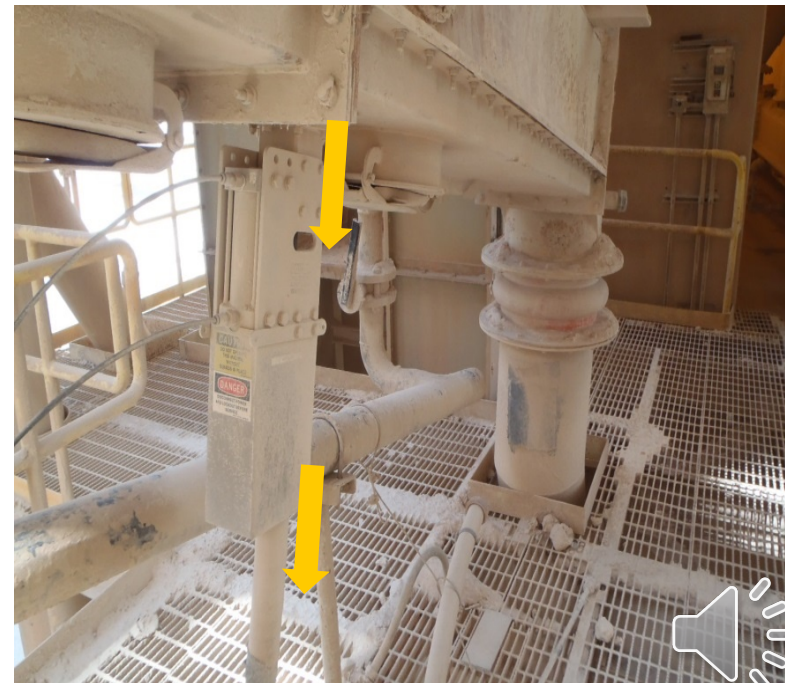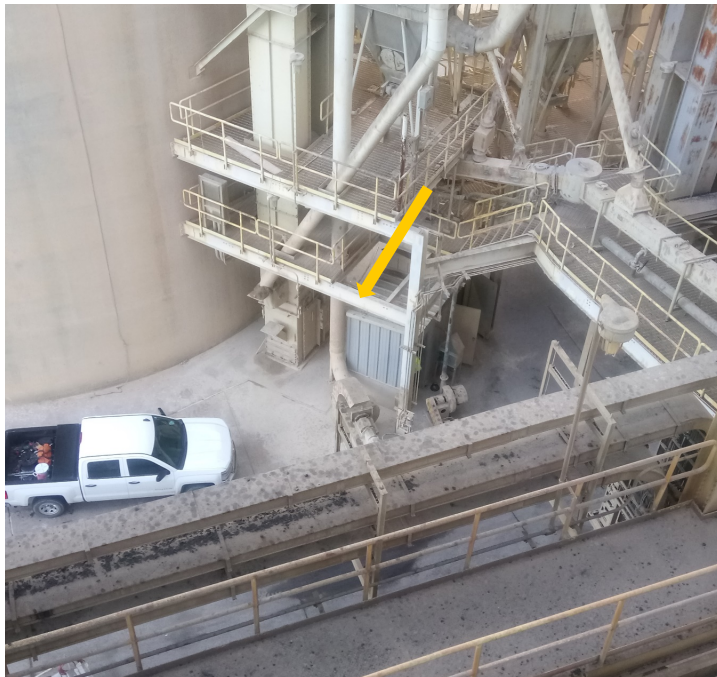HRTC XRF - High Resolution Real Time Continuous XRF (capability to measure all elements in the range Na-U)

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X-Series RMX

RMX Raw Meal Analyser

Raw Meal Application

- Large, highly representative sample intake
- Continuous operation with 20 complete data points per hour
- Installed in a better location and ruggedized for on-line use
- Powered by ClassX proprietary software
- Raw mix control
- Complete raw meal analysis
- Elemental analysis: Si, Fe, Al, Ca, S, Mg and more
- Provides accurate elemental data critical for calculation of properties important for raw mix control: LSF, C3S
- Smart, automated process that is intuitive to use

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ClassX software

Raw Meal is Sampled after the Raw Mill

The existing air slide sampler is used to feed the at-line analyzer located below
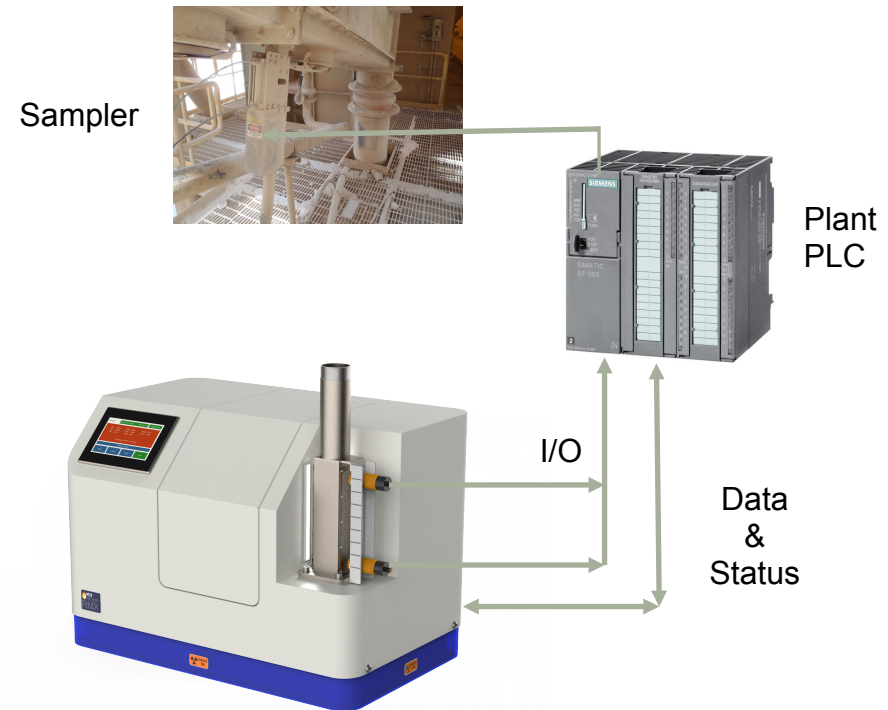
The plant PLC controls the system

The plant PLC monitors the status of the system

Plant PLC starts and stops the sampler etc based on analyser demand

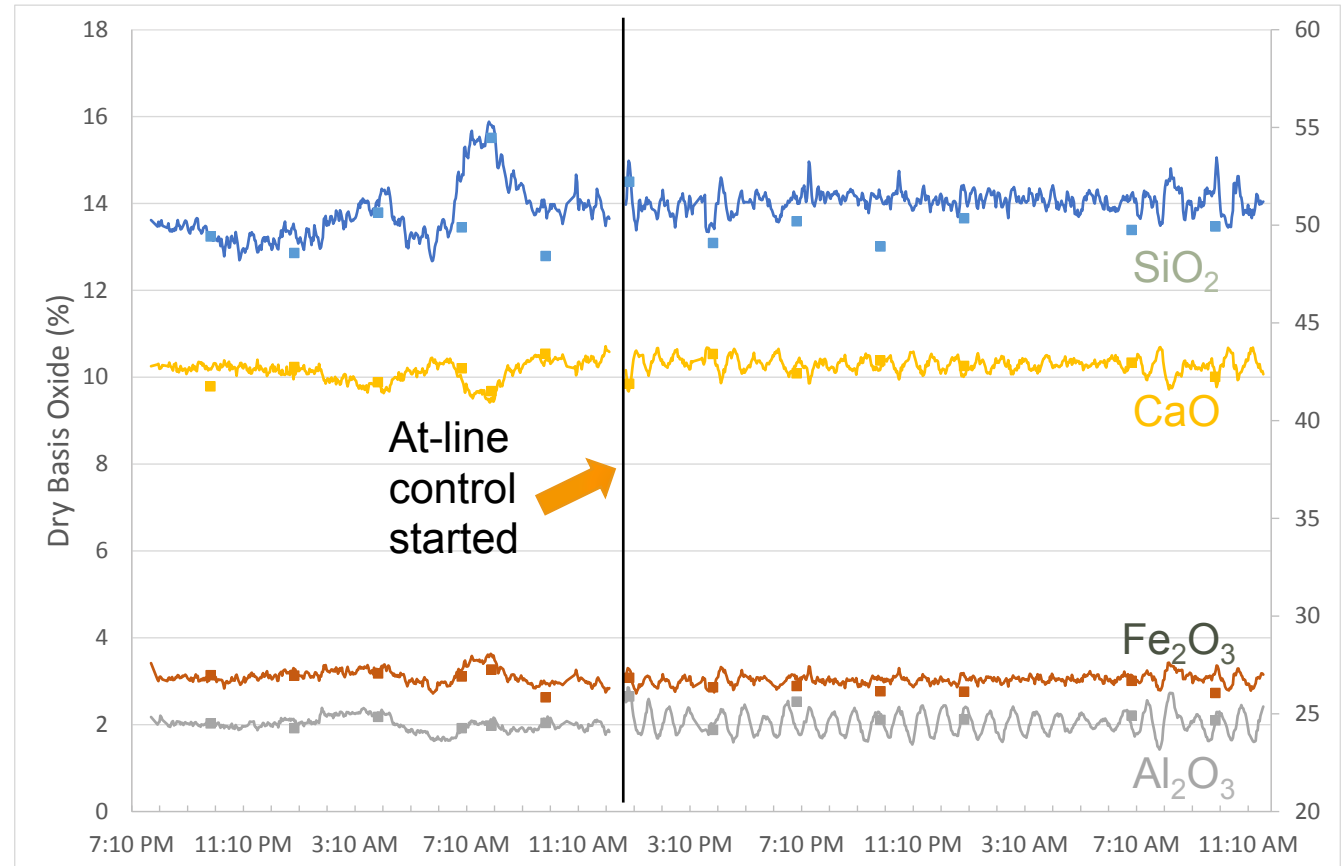Analysis results are sent to the PLC via network

Results are compared to targets

Automatic adjustments to feeders are made…

Sampler

Plant PLC

I/O

Data & Status

Results – At-line results of stockpile/heap change

- Robotic laboratory testing every 3hrs

- Added at-line 2-minute data!

- At-line control is started for the first time
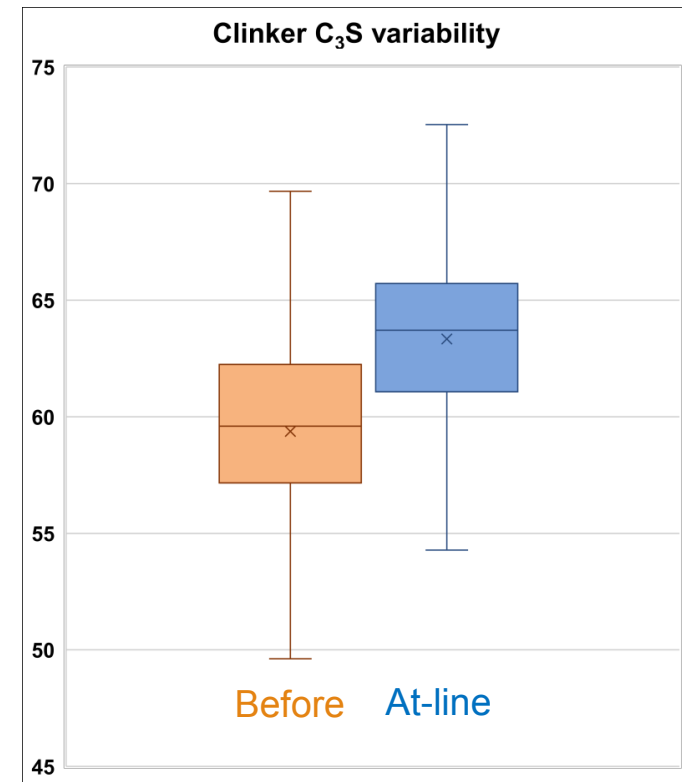
- Immediate smoothing but…

- Control loops need tuning.

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Results – Clinker C_3S results

- Kiln is more stable with at-line raw mix control

- Less high free lime excursions

- Able to increase C_3S target for higher strengths

C_3S	Before	At-line
Target	60%	64%
Std Dev	4.4%	3.6%

Box and whisker plot.
- 50% of values in box
- 50% of values on lines
- x is mean
- Mid line is median

Clinker C_3S variability

Before   At-line

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Summary

X-Series Analyser Benefits:

ϒ   Lower fuel cost

ϒ   Less energy requirements

ϒ   Reduced additive cost

ϒ   Less wear and tear on refractory (reduced maintenance and increased life)

ϒ   Less homogenization required

ϒ   Reduced kWh/t in cement milling

ϒ   Easier clinker grinding

ϒ   Back-up capability for lab equipment

ϒ   Low maintenance and cost of ownership

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THANK YOU

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