

# SUGAR

## Application Notes

Application Notes Year 3 - nr. 3 August 2004



### FIRST BRAZILIAN AUTOMATION SYSTEM ASIA-PACIFIC

#### SMAR INSTALLS AUTOMATION SYSTEM AT SUGAR REFINERY

##### INTRODUCTION

The NY Sugar Co. Ltd. is located in the Nakhon Ratchasima province in Thailand, approximately 300 Kms from Bangkok. Mill production at this facility is currently at 2.2 million tons of sugar cane.

NY Sugar produces raw sugar, VHP sugar, crystal sugar, refined sugar and powdered sugar for export - specifically for the Orient and Japan.

The daily production output is about 820 tons of refined sugar using the Smar Automation System. This installation includes four vacuum pans with a capacity of 340 HI each.



Partial views – NY Sugar Co., Ltd.

##### BACKGROUND

Previously, NY Sugar used automation control only for steam production (Tacuma boilers); for one mill transport line (Walkers mill); and for one continuous vacuum pan (FCB pan); utilizing local analog controllers from various suppliers.

With the current milling season, NY Sugar adopted strict criteria for automation of the refinery while continuously aiming to optimize both the industrial process and increase final quality of the refined sugar.



Refined Vacuum Pans Area

## REQUIREMENTS

In consulting with NY Sugar, it was essential that the automation system meet the requirements of increased production, boiler repeatability and final quality assurance of the refined sugar production. Loop controls and boiling sequences were evaluated during the system assessment and the proposed technology and devices were determined.

In addition to implementation of the automation system, the condensers were modified to multi-jets units with integrated mechanical agitators and stainless steel vacuum pans were installed.

## FIRST AUTOMATION IMPLEMENTATION

The comprehensive analysis for plant automation encompassed the complete industrial process. Planning and development resulted with implementation in multiple stages.

In Stage I, four refined sugar vacuum pans were installed. Installation of the automation system will then continue in other areas such as juice treatment, evaporation, sugar factory and steam generation.

## EXPANSION AT EASE

The many advantages for future expansion of the control system include:

- Complete system configuration was developed jointly by the mill's technical team and Smar engineers to customize for NY Sugar's specific needs
- Man Machine Interfaces were particularly user-friendly
- The expansion development included a timetable for the involved professionals and accounted for timely installation of the equipment to prevent any interruption of the mill operation during milling season



Details of Field Equipment Installation

## COMPLETE PROCESS INFORMATION AVAILABLE

An operation platform was adopted for use in the workstations in which they installed the supervisory and management systems for the pans. All process information and conditions were integrated and are now easily accessible for management and supervisory control.



Details of Local Control Panel (see HIM detail)



Details of Complete Control Panel (see PCL detail)

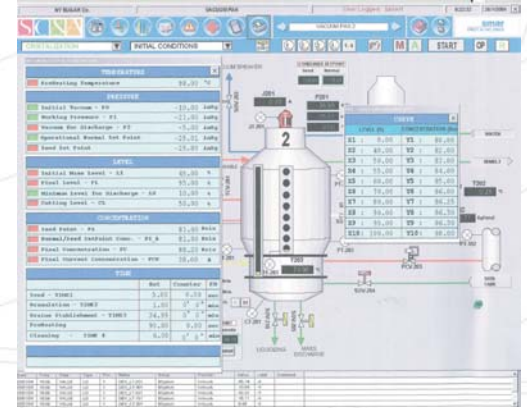
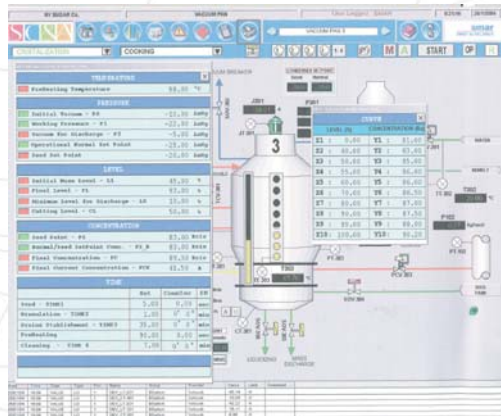


## SOLUTIONS

The simplicity and ease of decision-making provided to supervisors was a decisive factor in the immediate adoption of workstations throughout the facility.

In addition, operation failures decreased considerably as process information details were provided simultaneously for review and control.

Moreover, the automation made it possible to locate which critical points in the process required control, while improving the pre-established control loops.



Details of Vacuum Pan Screens

## BENEFITS

The Automation Strategic Plan is extremely precise and is designed according to each customer's specific application.

Each sugar mill is distinct and has particular differences unique to its application procedures. The following benefits highlight the successes achieved in the NY Sugar facility:

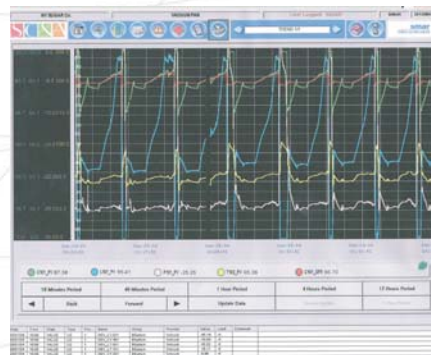
- Reduced powder residue waste
- Achieved standard boiling sequence
- Increased consistency and uniformity of crystal formation

Overall improvements include:

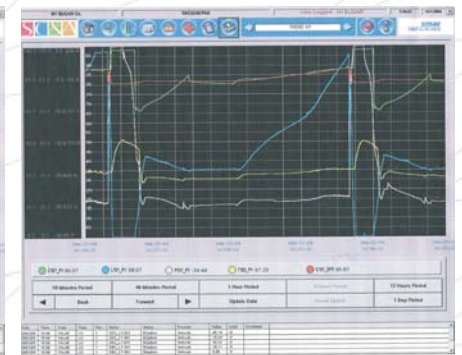
- Complete process control
- More efficient power usage
- Better final product quality
- Reduced product waste
- Increased operational safety
- Improved technical knowledge of operators



Refined Sugar Vacuum Pans – Control Room



Supervisory Screen – NY Sugar Automatic Mode Boiling



Supervisory Screen – NY Sugar Manual Mode Boiling

- Green = Concentration ( Brix )
- Blue = Massecurite Level ( % )
- Red = Agitator Current ( A )
- Yellow = Temperature ( ° C )
- Rose = Vacuum Pressure ( mmHg )

## CONCLUSION

The success achieved with the NY Sugar plant automation is a direct result of remarkable team effort. The dedication and energy of the customer's technical staff was outstanding and highly commended. Many individuals involved in the transition were knowledgeable with manual operations and did not have any previous experience with automatic process control.

However, the technical knowledge and abilities of the operators are now greatly increased with the implementation of this automation system.



NY Sugar Products

**MUITO OBRIGADO !  
THANK YOU VERY MUCH !  
KHOOP – KHUN !**

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