SUGAR
Application Notes

Application Notes Year 3 - nr. 4 November 2004

SHAHU MILL – VACUUM PANS AUTOMATION

Mr. Pratap - Indpro (Smar Rep) and Mr. Ghatge (Chairman Shahu) - Indian Cerimony

Smar Pioneer Arrives to India

Mr. Pratap - Indpro (Smar Rep) and Mr. Autade (Director Shahu) - Indian Cerimony

According to the Sugar & Alcohol International Division goals and making facilities to allow continuity the an aggressive approach to new international markets, with dedicated focus to Asia-Pacific area, after the success in Thailand (NY Sugar Co., Ltd), the first Smar automation system were recently installed in India.

That is an initial automation system of 3 vacuum pans (sugar factory) installed at an important Indian sugar mill, SHREE CHH. SHAHU S. S. K. Ltd., KAGAL, in Kolhapur province, in the most important producer Indian state for sugar, Marahastra State.

As per the final results reached with Smar automation system installed, the Shahu Sugar mill chairman, Mr. Ghatge promoted a traditional Indian ceremony, during the official opening last milling season.

Smar intends to publish these achievement and success, transcribing, as bellow, the technical paper written by Mr. B. S. Solase, Shahu Chief Chemist.

Gradual Automation Implementation

According to Shahu Mill needs, the first automation implementation was installed at sugar factory at 02 massecuite "B" vacuum pans and 01 massecuite "C" vacuum pan, supplied by Smar local representative at India, Indpro Electronic Systems Ltd., located at Pune.

Expansion Ease

Among advantages for future expansion of the control system, the following may be emphasized:

- The entire system configuration was developed jointly by the mill's technical team and Smar engineers
- The method adopted was that of a timetable for the professionals involved and the period of the equipment's installation, without interfering with the harvest period and the mill operation.

Loop Control Philosophy

a) Brix:

According to the table containing a previous level and concentration (brix) set points, the loop control gets to control the sugar product flow exactly according to established points of the curve of the table, warranting the corrective actions for each level and brix corresponding.

The considerable facility is that the operator can see every process variable at computer screen and if is necessary to change the brix or level point adjustment.

b) Vacuum Pressure

The vacuum pressure is controlled by operating the water flow control valve at the spray jet in the condenser. The same facility described above happens to the operator procedures.

c) Level

The same table described to control the concentration (brix) by operating the sugar product flow makes a correct management until the final level and the final concentration are reached.

Mr. Mansing - Indpro Engineer

Benefits

a) The water movement on pan floor was reduced except at mass preparation step (final hardening).

Movement water reduced	0.5MT/Hr
Steam saving	0.475 MT/Hr
Bagasse saving	0.216MT/Hr
Bagasse savin for season	616MT
Total cost saving for season	Rs.493516

b) Increase capacity production:

Approximately 1 hour economy was observed during the mass "C" boiling, corresponding to another new boiling sequence profit.

Its means an expressive steam economy.

Steam saving	0.25MT/Hr
Bagasse saving	0.113MT/Hr
Bagasse saving for season	322MT
Total cost saving for season	Rs.257000

c) Exhausted molasses purity:

Considering that automation system operates maintaining the supersaturation degree inside of metastable zone, the crystals formation happens starting from the liqueur mother exactly from the nucleus, by consequence, the better exhaustion is obtained.

Mrs. Mansing, Pratap (Indpro) and Mrs. Nerlikar, Tamhankar (Shahu)

d) Condenser injection water consumption:

A water injection consumption reduction was observed in to the condensers that indirectly consists in energy saving.

As the automation system was installed only at 3 vacuum pans, at the end of complete automation, including all pans, this benefit can be measured allowing the correct calculation of these energy savings and effective costs.

e) Boiling consistency:

The automation system allows the boiling sequences happens always in correct level and brix values previous established, maintaining the supersaturation always inside the metastable zone, warranting no new crystals appearance and also, no false grains formation.

This correct procedure in to the boiling supplies a better massecuite exhaustion also improving the purging at sugar centrifuges.

Shahu Final Results

Daily, the Shahu sugar factory accomplishes from 15 to 18 boiling using mass discharge. In this period we could observe that between discharges in manual way, the time intervals happened in 20 minutes. After the automation system was installed, these time intervals were reduced to 10 minutes, collaborating with the increase of boiling sequence numbers and consequently, increasing the sugar production.

Another positive occurrence was the reduction from 5 to 2 operators necessity to realize the same operation procedure.

The largest impact registered with the automation system operation was to associate the operation easiness with the vacuum pans capacity increases.

Mr. Solase Testimony

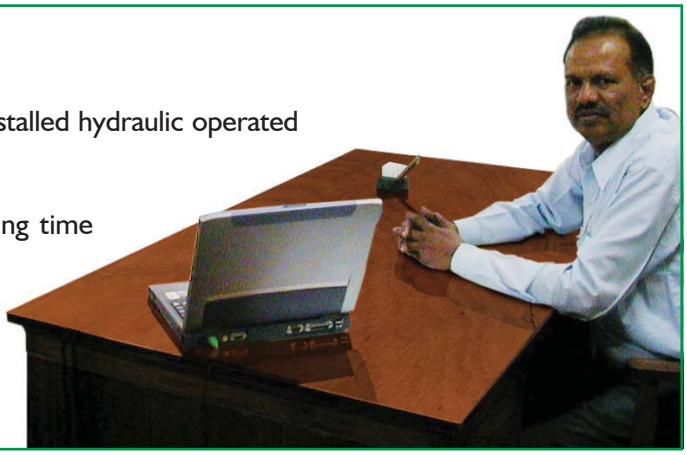
Besides "auto feed control system", during this milling season we installed hydraulic operated valves at massecuite "A" vacuum pans, at totally 18 pans.

This decision made a considerable contribution reducing the boiling time intervals.

Basically, all the automation system installed had worked successfully.

Mr. B. S. Solase -

Chief Chemist (Shahu)



Conclusion

Considering the hydraulic discharge valves installation and the Smar automation system, we got the 2 to 3 work position reduction in each shift of sugar factory, re-conducting these professionals to another positions work.

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