Technological Development to Improve Profitability of Sugar Industry

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Introduction

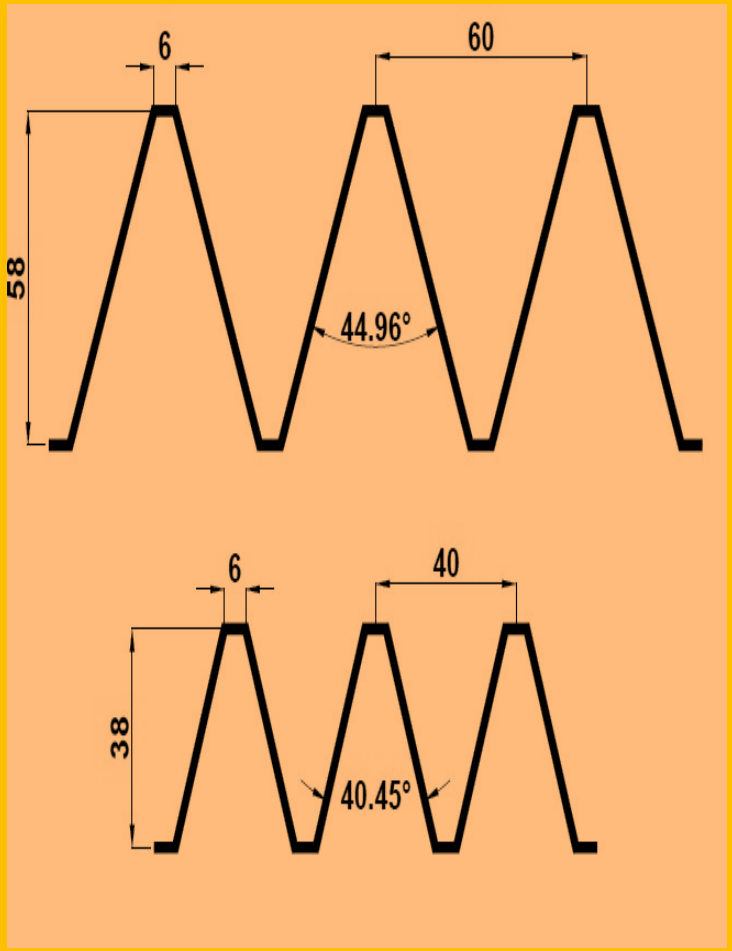
1. Achieved highest Mill Extraction
2. 1st Time working experience of Carbonation system along with Talo floatation Clarifier and Deep Bed Filter
3. Proper 2nd Vapor bleeding system on Pan Station
4. Modification in C-vertical crystallizer

Establish highest Mill Extraction

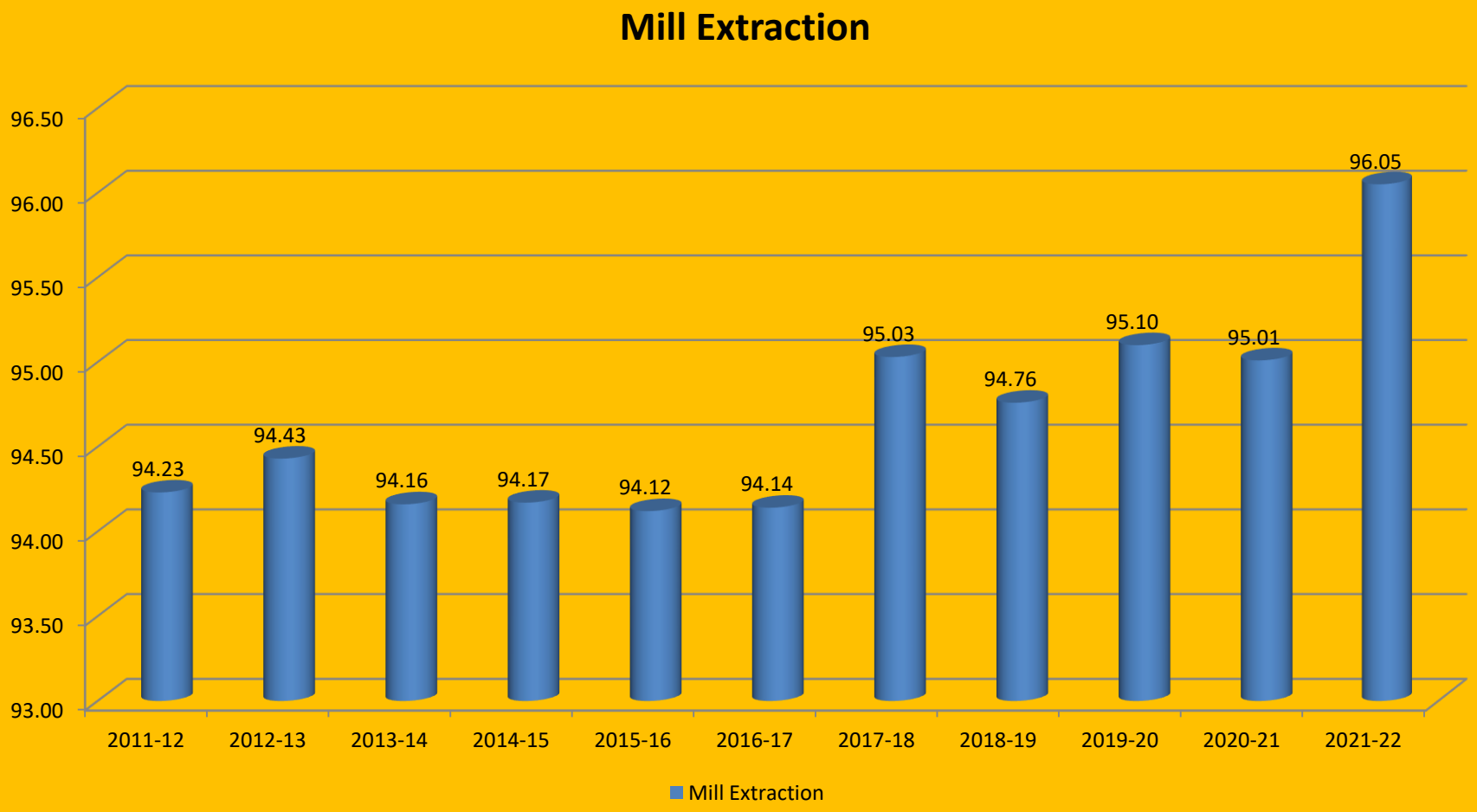
1. Hi-Mech Two Roller Mill installed in 2016-17
2. Mill # 1 Successfully operated upto 6 season with same Roller dia.
3. Saved Mill Roller re-shelling cost
4. Desired setting & Extraction of Mill #1 maintained by replacing 04 No pinions .

Establish highest Mill Extraction

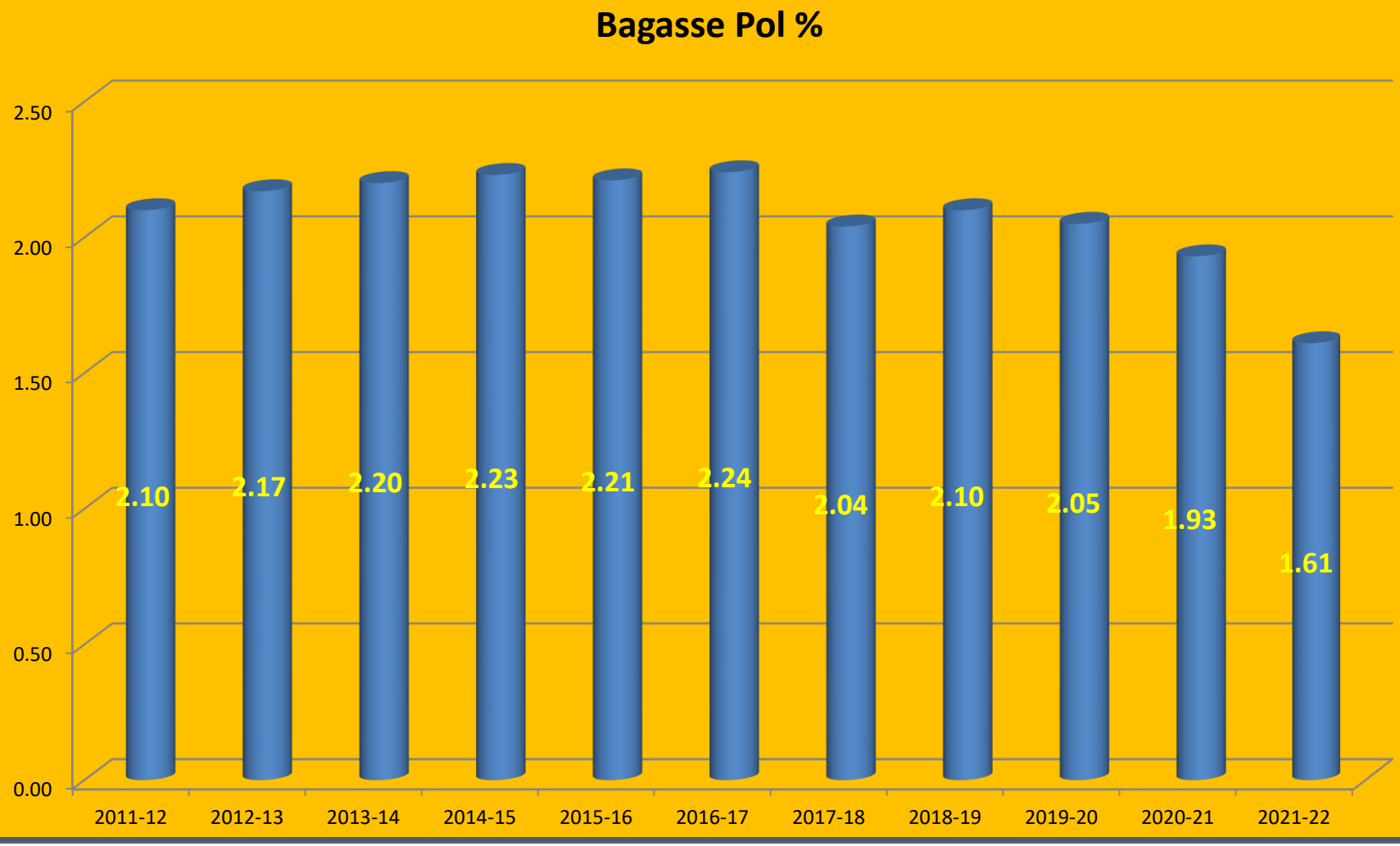
1. Change the pitch of mill# 4 & 5 from 60 to 40 mm & 30 to 40 mm
2. Improved Imbibition system by applying trash plate Imbibition system on mill#4 &5.
3. Change the last mill setting discharge opening reduced from 09 to 08 mm
4. Bagasse moisture reduced by 1%.



Establish highest Mill Extraction

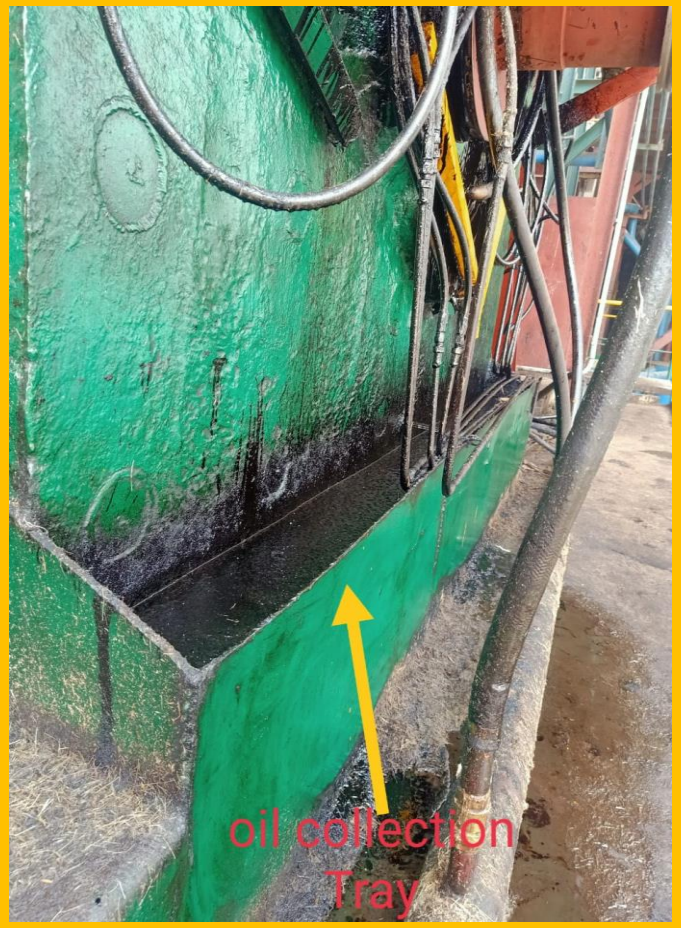


Establish highest Mill Extraction



Mill Bearing lube oil collection

- To protect mill effluents from mixing of oil.
- Oil collection tray size 400X140X3000 mm welded in headstock as shown in picture.
- Collected oil used in mill pinions and surplus collected used oil sold out
- Last season 50 drums used oil sold-out, at cost of PKR 200,000 .

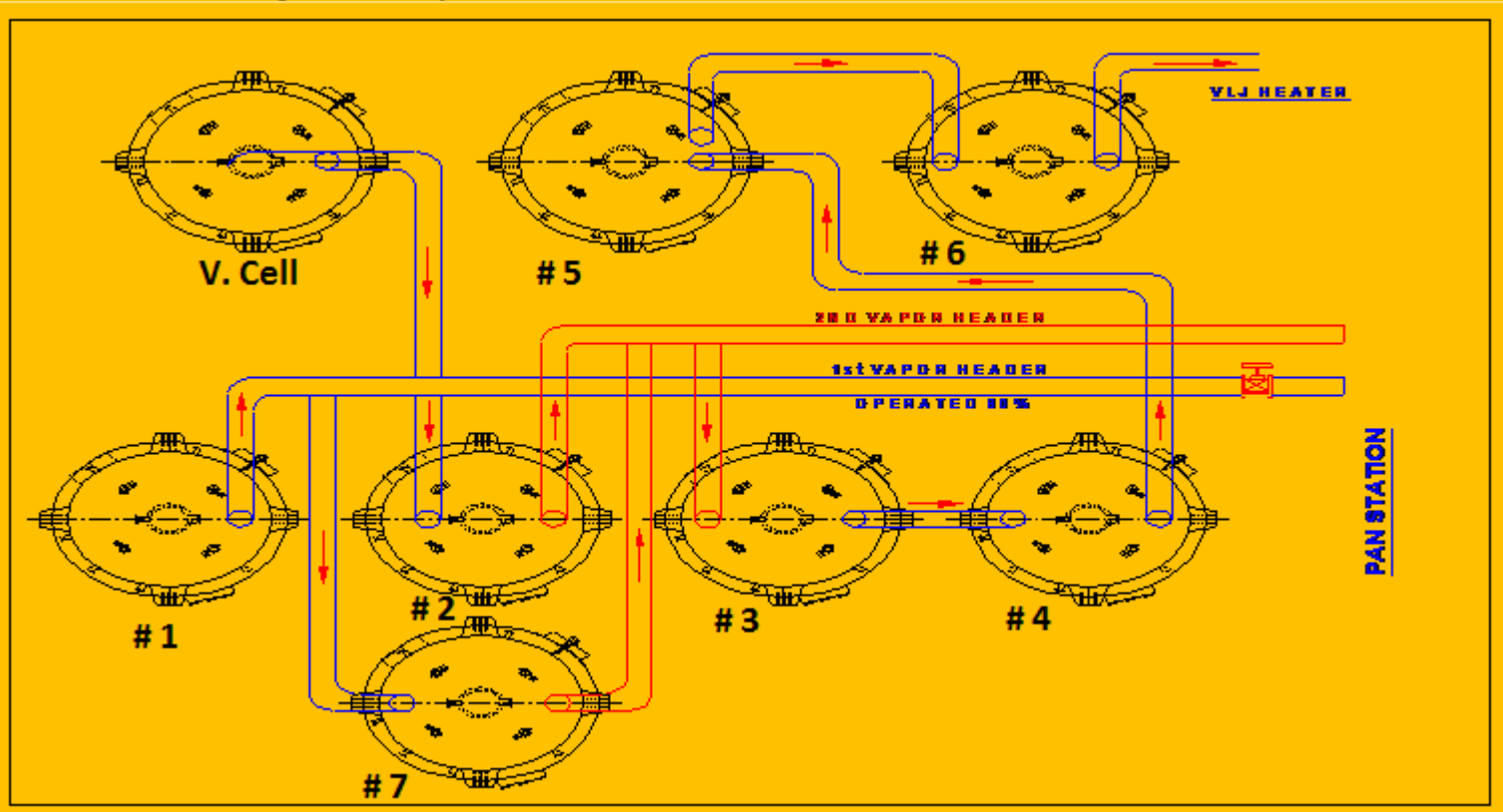


Steam Economy at Pans

- Importance of 2nd vapor bleeding.
- Utilized 2nd vapor bleeding on pan station to minimize steam consumption.
- Pervious MSM utilize directly 1st vapor bleeding on pans.
- Additional vapor header provided from evaporator No.2 and damper (Valve) install at 1st vapor header.
- Operate 60% of 1st vapor damper and remaining vapor used from 2nd vapor bleeding on pan No.1,2,3 & 4.

Steam Economy at Pans

- Block diagram of 1st vapor Plus 2nd vapor bleeding on pans.



Steam Economy at Pans

- By utilizing 1st vapor plus 2nd vapor bleeding on pan No.1, 2, 3 & 4, smooth boiling observed at pans, evaporators and juice heaters.
- The energy of vapor saved in terms of live steam 4000 Tons in season.
- Bagasse saved 2000 Tons.
- Cost of bagasse saved Pkr- 8 Millions at the rate of 4000 Per Ton.

Refinery System

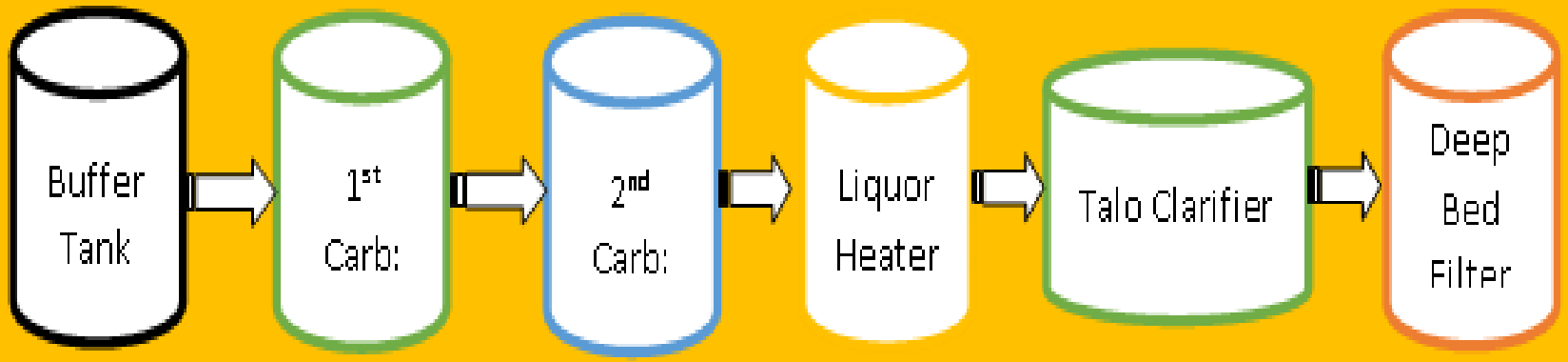
- 1st and 2nd Carbonation system. It is a cheap and robust process.
- Carbonation calls for the precipitation of calcium carbonate through adding lime & CO_2.

  $CO_2 + Ca(OH)_2 \longrightarrow CaCO_3 + H_2O$

- MSM operated carbonation system along with flotation clarifier and Deep bed filter.

Refinery System

- Block Diagram of refinery system used in Matiari Sugar Mill.



Refinery System

- Refinery system consist of Carbonation run on minimum chemical cost, high quality of sugar
- Last season it is practically observed reduction in.
- Phosphoric acid
- Talofloat
- Decolorizer, In the end of season decolorizer completely minimize.

Refinery System

- Matiari Sugar Mill average quality of liquor as shown in following table

Description	pH	ICUMSA (Color)	Turbidity
Sample # 1	7.0	369	27
Sample # 2	6.9	430	38
Sample # 3	7.0	276	32

C Vertical Crystallizer

- C-Vertical Crystallizer economically important for final recovery of Sugar from Massecuite,
- Matiari Sugar Mills raise the foundation height of C-Vertical Crystallizer upto 2 meters.
- To increase the flow of C-Massecuite
- Improve the feeding of Massecuite at C-Centrifugal Machines
- Improvement Brix of Final Molasses
- 0.5 % Reduction in Final Molasses.

Conclusion

- Reduced rollers re-shelling cost with maximum mill extraction.
- Reduced chemical consumption by applying carbonation system in sugar refinery.
- Save bagasse upto 2000 MTR, by optimum usage of 1st and 2nd effect vapors on pans.
- Reduced final molasses by increasing foundation height of crystallizer .

Thank You