

# **PAPER ON: - OVERALL PLANT STABILIZER FOR IMPROVEMENT IN CANE PREPARATION, CRUSHING & RESULTS IN CANE SUGAR INDUSTRY.**

## **BACKGROUND**

Cane sugar industry is facing financial crises due to FRP (Cane Price given to Farmers) & comparatively reducing prices of sugar day by day, increasing production cost, draught condition resulting in unavailability of sufficient cane, changing government policies. There are also several technical problems and losses in sugar industries due to manufacturing defects, lack of proven technology at some station. Loop holes resulting in less efficiency during modification, expansion & addition of plant and machinery. Collectively these problems led to the huge losses to sugar industry & nation due to reduced crushing capacities, less efficiencies, long duration repeated stoppages, break downs & failures collectively resulting in high total sugar losses resulting in low sugar recovery.

There is a serious problem of uneven feeding to all preparative devices & milling tandem in the sugar industry. Uneven height of cane bundle are passed from chopper and leveller, this uneven blanket i.e. up & down blanket passing towards cane fiberizer, has very irregular and poor density of around 275 to 350Kg/m<sup>3</sup>. There are so many problems due to irregular, uneven feeding resulting in the cut cane blanket height and quantity is always uneven & also up & down. All of these problems, results in less crushing rate, irregular milling performance, irregular bagasse quality & boiler efficiency resulting to reduce export of co-gen frequently.

## **EXISTING SETUP IN THE SUGAR INDUSTRY**

For cane preparation there are three machines installed, one after another in series on cane carrier. The cane chopper/Kicker, Leveller or cutter & fiberizer or shredders to achieve continuous working & achieve high cane preparation for cane milling tandem. The expected preparatory index is in the range of 85 to 88. The cane preparation is expected of shred of long hairy fiber type & not in the powder form.

### **General observation & Problems without Overall plant stabilizer & Existing Preparatory Devices**

Cane bundles dropped from all feeder tables are not equal by width, depth, length & density. When same cane bundles passes through chopper & leveller, the cut cane blankets going to fiberizer are always up & down. This results in frequent load variation i.e. up & down load on fiberizer. As fiberizer load is sensed in A.C.F.C. (Auto cane feed control device) it reduces & Fluctuates cane carrier speed frequently affecting on crushing rate minimum by 50 ton/Shift i.e. 150 ton/day. This results in always unequal quantity of prepared cane going to mill & boiler. As mill setting & mill RPM are constant it results in wet bagasse & also on mill extraction when less quantity of bagasse passes through same mill opening. These variations can be observed in every minute on mill load i.e. current of mill driving motors (prime mover). This more & less quantity & simultaneously wet & dry bagasse going to boiler effects on variations in load, pressure & temperature of steam & ultimately resulting to reduce generation & export of co-gen turbo-alternator minimum 5-6 time in one hour.

**Overall plant stabilizer for Improvement in cane preparation, Crushing & Results in cane sugar industry.**

#### **Description:-**

The objective of Overall plant stabilizer for improvement in cane preparation, Crushing & Results in cane sugar industry, is to level the blanket height, quantity & increase density of cut cane

going to fiberizer. The Overall plant stabilizer is situated in between leveller & fiberizer. This Overall plant stabilizer is the first time moderately designed & located at this new position. The Overall plant stabilizer has special knives having sharp edges, if necessary to cut & throw back the excess height blanket of prepared cane. This Overall plant stabilizer is designed to rotate in reverse direction as compared to the travel of incoming cane on the cane carrier. The Overall plant stabilizer rotates in the range of 40 to 60 rpm. The Overall plant stabilizer assembly is connected to electric motor through the speed reduction gear box. These motor, gear box & Equalizer assembly along with the pedestal can be erected on fabricated staging structure & without requiring civil foundation. As the uneven height cane blanket comes to equalizer. The excess blanket cane is thrown back towards leveller and dropped in gaps & voids to correct level of prepared cane blanket. This also increases the density of prepared cane going to fiberizer, due to press & vertical force of knives on the prepared cane blanket passing through it. The density of approaching cane is enhanced to 400 to 425 kg/m<sup>3</sup>. The compact density, properly levelled and stabilized flow of prepared cane is allowed to pass towards the fiberizer. Thus this uniform feeding has resulted in minimum variation & fluctuations in load of fiberizer & hence fluctuation in Auto Cane Feed Control system are minimized, resulting in increasing crushing rate. Also juice flow fluctuation observed are minimum. Uniform preparation has led to uniform bagasse generation & also fiber size is uniform resulting in optimizing boiler efficiency, Co-generation & bagasse saving.

Thus Overall plant stabilizer is most economical unit which stabilizes whole plant, increases crushing rate which is lost in fluctuation of cane carrier. Also it optimizes bagasse saving & power export, as equal, constant & good quality dry bagasse goes to boiler & fluctuation in load, pressure & temperature of boiler are minimized.

### **Some of the Advantages, Features, Benefits of Overall plant stabilizer**

- 1) Keeps equal load on fiberizer & reduces cane carrier load, speed fluctuation problem & increases bagasse density going to fiberizer.
- 2) Gives constant & equal bagasse flow to fiberizer, mill & boilers, resulting in minimizing mill Donnelly chute jamming problem, reduces wear & tear of mill components. Also reduces wet bagasse (during gaps & fluctuations) going to boiler.
- 3) Reduces fluctuations in boiler load, pressure, temperature & efficiency, which results in reduction of fluctuations in Co-gen plant, electricity generation, export & efficiency.
- 4) Increases crushing rate by 100 to 150 ton per day, increases bagasse saving by minimum 15 to 25 M.T. per day, even export of power by 3000 to 5000 unit per day.
- 5) Stabilizes capacity & efficiencies of whole mill, boiler, turbine, co-gen & boiling house i.e. whole plant.

### **Conclusion**

Thus Overall plant stabilizer has tremendous benefits & solves so many problems & increases crushing rate, bagasse saving & export of co-gen as it stabilizes whole plant.