

Sugar end modernisation at The Amalgamated Sugar Company

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The Amalgamated Sugar Company LLC operates three beet processing factories in Southern Idaho, USA. The factories are at Nampa (11,850 t/d), Twin Falls (6,800 t/d) and Paul (17,000 t/d), Idaho. In 2009 a 5-Year Capital Improvement Plan was approved with the intention of improving and optimising the overall operational efficiencies and capacities of the company's processing facilities. The plan included the replacement of batch crystallisation vacuum pans and severely undersized cooling crystallisers in order to improve energy efficiency and significantly reduce molasses produced purity. In addition, the plan also provided for the rearrangement of sugar end operations to improve the efficiency of co-processing molasses separator extract with thick juice on a year-round basis.

To accomplish the desired performance objectives the plan provided for the purchase and installation of new continuous pans and/or cooling crystallisers at all locations, new continuous centrifugals at the Nampa factory and a new sugar dryer and fluidised bed coolers at the Twin Falls and Paul factories. After thorough evaluation, BMA was chosen by Amalgamated to supply all of the major equipment for the planned improvements. The decision to go with the BMA equipment was based on BMA's proven track record and worldwide reputation with respect to the performance of the equipment offered by them as well as BMA's ability to meet the aggressive timeline of the project.

The order from BMA consisted of four OVC cooling crystallisers, two low raw VKT pans, one high raw VKT pan, three K3300 continuous centrifugals for high raw service, three K3300 continuous Turbo centrifugals for low raw service, one rotary sugar dryer and two fluidised bed sugar coolers to be delivered and commissioned over a two year period beginning with the first commis-

sioning in June of 2011 and ending with the final commissioning in June of 2012. For the sugar dryer and fluidised bed sugar coolers, BMA was able to respond quickly and efficiently to relatively short lead times for these orders to meet the available and quite narrow installation time frames.

The first equipment to be commissioned was at the Nampa factory in early July 2011. The installation at Nampa included three K3300 high raw centrifugals, three K3300 Turbo low raw centrifugals, a low raw VKT with a capacity of 22 t/h and a low raw OVC cooling crystalliser matching the capacity of the low raw VKT. For this installation, BMA was responsible for not only the delivery of the equipment on schedule but also for the performance guarantee of the low raw crystallisation process to produce a maximum of 60 purity molasses produced. The new equipment was commissioned on schedule and within a short time was meeting stated guarantees and Amalgamated's expectations. As a result of the project, molasses produced purity was clearly lowered to 60 %, increasing extraction from thick juice. The modified sugar end configuration made possible by the new equipment installation has allowed the co-processing of increased quantities of molasses separator extract with thick juice with virtually no impact on sugar colour or sugar end sugar capacity and no co-mingling of virgin molasses from thick juice crystallisation with extract molasses from separator extract crystallisation.

The Twin Falls factory next commissioned a complete BMA sugar drying and cooling plant in August 2011. This installation included a new rotary sugar dryer and fluidised bed sugar cooler. The objective of this installation was to optimise sugar end capacity by increasing sugar drying and cooling capacity while also insuring proper temperature of sugar to storage during operation in periods of relatively high ambient air temperature.



*Chris Rhoten checking the
massecuite in the 4th
chamber of the VKT*

Commissioning and subsequent operation of the sugar drying and cooling equipment has met all expectations.

In addition to the dryer/cooler installation, the Twin Falls factory is planning to commission a new low raw OVC in September 2012 replacing the current undersized and obsolete cooling crystallisers. The overall objective at Twin Falls is to optimise sugar end utilisation and production capacity while also significantly increasing low raw cooling crystalliser capacity and significantly lowering molasses produced purity for improved granulated sugar recovery from thick juice.

In November, 2011, the Paul (Mini-Cassia) factory commissioned a high raw VKT, low raw VKT and two OVC cooling crystallisers. This commissioning took place as a transition during full operation of the "old" sugar end equipment to the "new" equipment and was staged in a manner where no stoppage or reduction in sugar production rate was incurred. BMA and factory personnel worked as a team together to achieve this major transition in operations with virtually no disruption in factory operations. The new equipment replaced both batch high raw and batch low raw crystallisation and the severely undersized continuous horizontal cooling crystallisers. Displaced batch pans were reconfigured to white service and seed production for the VKTs. The objective at the Mini-Cassia factory was to optimise sugar production capacity while reducing molasses to 60 purity or lower. In addition, steam usage in the plant was to be reduced from 23 % to 19 % steam on beet by arrangement of the heating vapour source as 6th (10.5 psia) vapour for the high raw VKT and as 5th (17 psia) vapour for the low raw VKT allowing for the complete utilisation of waste heat for raw juice heating. The final element of the sugar end expansion at Mini-Cassia will be realised with the installation of a new BMA fluidised bed sugar cooler to be placed in service July 2012.

After just three weeks of operation, the new equipment at Mini-Cassia was meeting expectations and the factory is in the process of fine tuning the new factory steam balance configuration to meet steam consumption targets and the new sugar end mass balance for increased sugar production and lower molasses purity. The BMA



Nampa sugar factory

equipment and its configuration in the new sugar end has given the factory broad flexibility for processing thick juice of relatively wide variation in quality as is often encountered in Southern Idaho. The factory operating personnel are quite happy with the installation and are rapidly gaining confidence in the operation and optimisation of the new equipment.

In summary, the installation and commissioning of the BMA VKTs, OVCs and K3300 centrifugals has been quite successful and The Amalgamated Sugar Company is quite happy with the BMA equipment and operating results thus far. The equipment delivery, assembly, commissioning and initial operational performance have all been good, meeting the expectations of the plant personnel and management and giving Amalgamated the performance and value that was expected.