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Practical experiences with the new extended program of BMA pulp presses

Since 1991 BMA manufactures vertical pulp presses of the HP 4000 type. A number of these pulp presses have been used in several installations to the entire satisfaction of the sugar factories' personnel. Among these installations are the four HP 4000 presses that were installed at Southern Minnesota Beet Sugar Cooperative for the 1999 campaign together with the worlds largest counter current cossette mixer and two extraction towers.

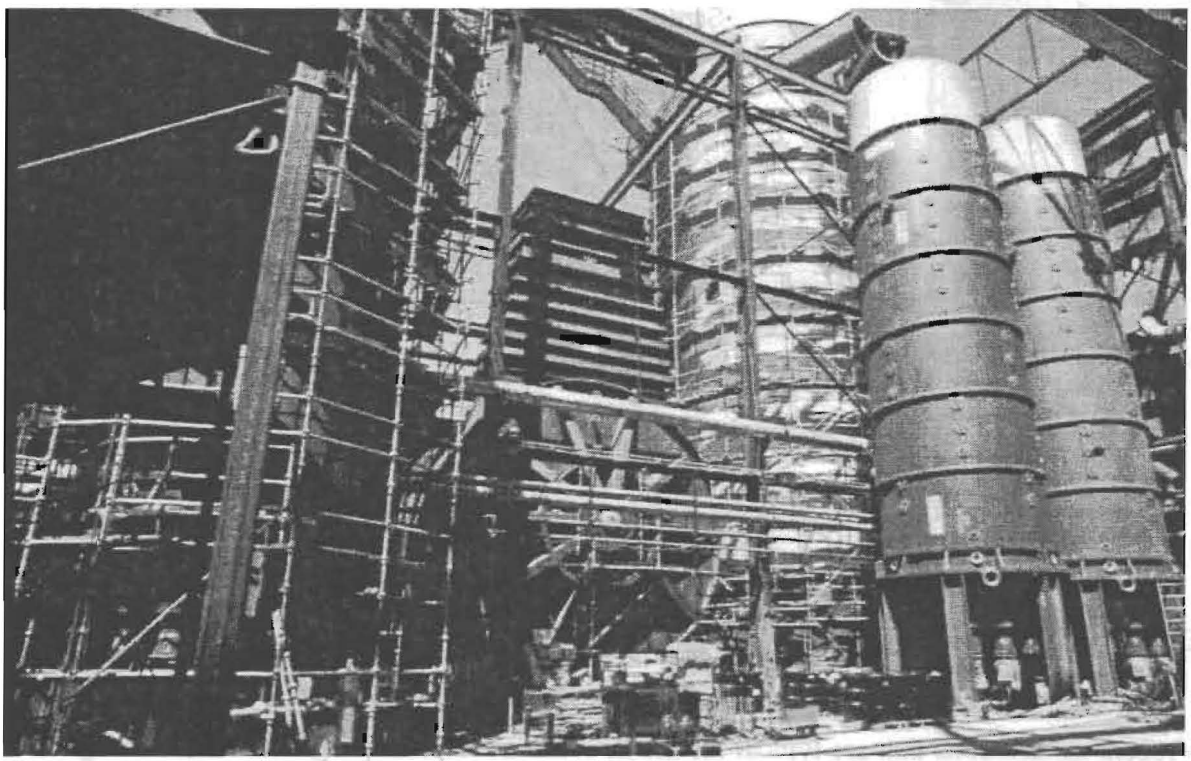

Fig. 1: Counter current cossette mixer, extraction tower and presses at SMBSC during erection

BMA's HP pulp press program of has recently been extended. Practical experiences and test results of two new installations shall be reported. Details of the design of BMA's vertical pulp presses have been presented earlier [D. Bosse, ASSBT 1997]. The design concept is based on a single spindle in a vertical arrangement so that this type of press can be ideally located next to an extraction tower with only a minimum need for conveying elements. This furthermore provides a self cleaning effect of the space behind the screens and reduces bacteria losses. The wet pulp enters the press at the top (Fig. 2) and is forced through the narrowing gap between the spindle and the outer shell. The liquid pressed out of the pulp presses through screens in the outer shell and the spindle is collected at the bottom of the press. The pressed pulp is also discharged at the bottom. The frequency controlled drives are located at the lower end of the vertical pulp press.

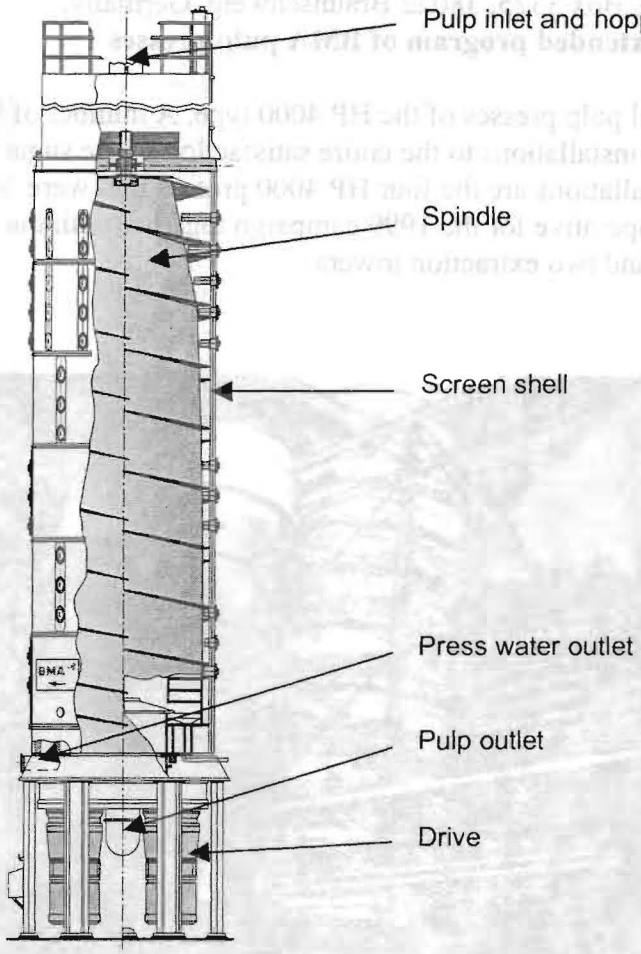

Fig. 2: Design of vertical pulp press HP series

The two recent installations that are typical for the new extended press program are in the sugar factory Ochsenfurt, Germany (Fig. 3) and the sugar factory Brugelette, Belgium (Fig. 4). The targets to be achieved in these factories, with regard to the dry substance of the pressed pulp, were different because the local markets for the pulp are different. Brugelette is in the fortunate position not having to operate a pulp dryer, as all pulp is sold for direct feed or for storage. For this reason a dry substance content of the pressed pulp of approx. 24 % DS is sufficient. The sugar factory Ochsenfurt must dry all its pulp and thus requires the dry substance content of their pressed pulp to be higher than 30 % in order to minimize energy consumption. Both factories needed a maximized throughput for their new presses.

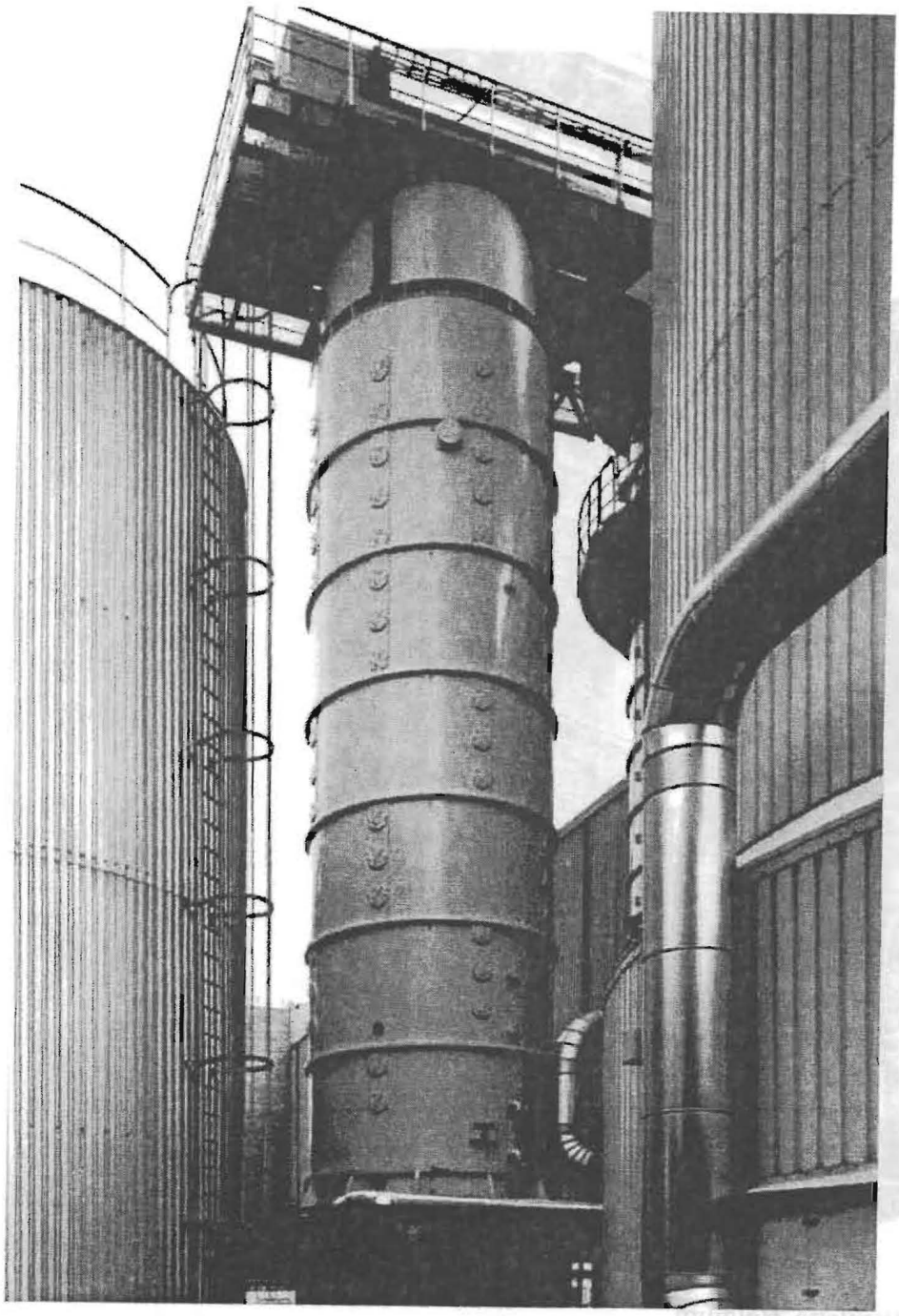

Fig. 3: HP 4000 L in Ochsenfurt, Germany

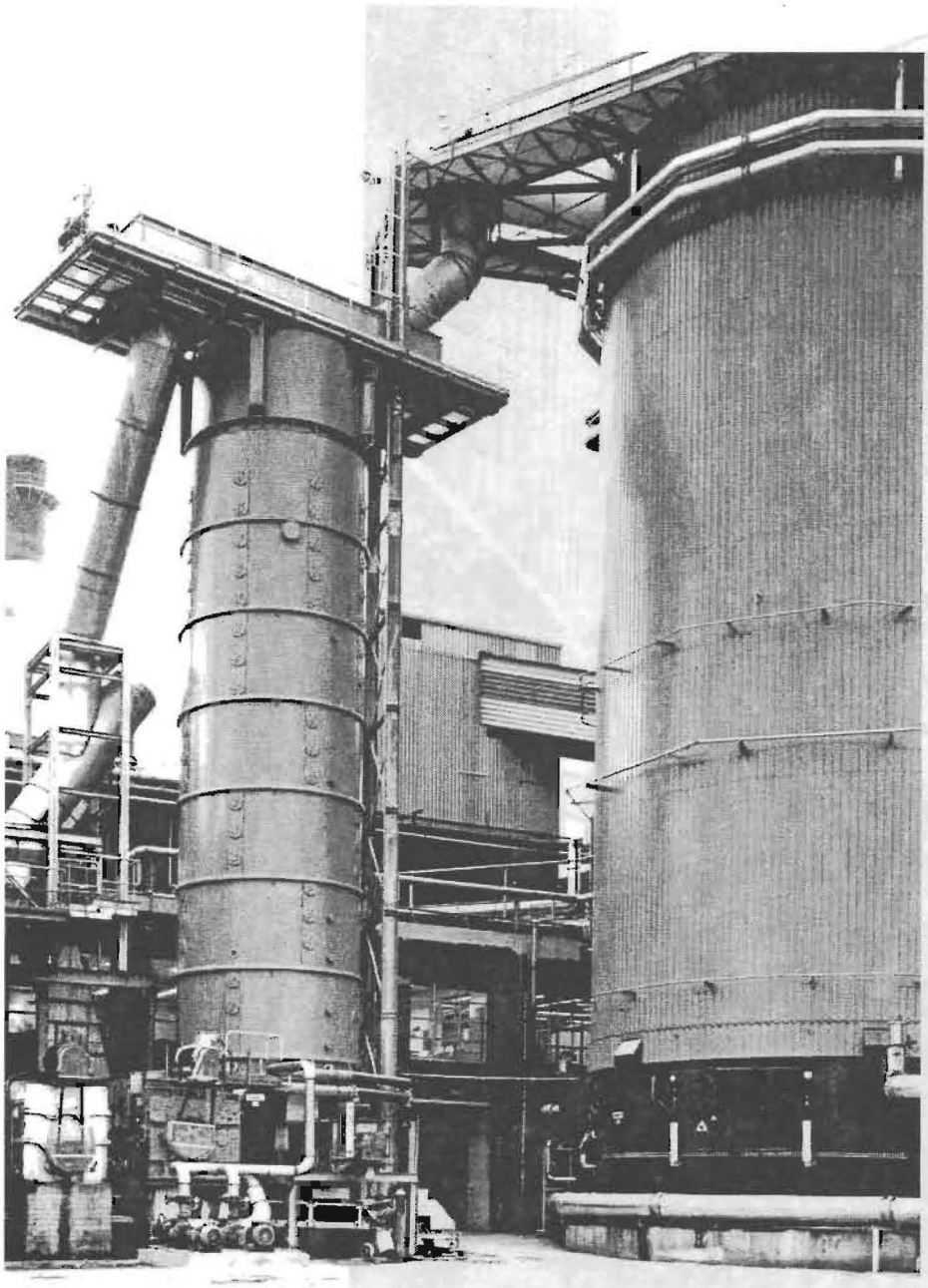

Fig. 4: HP 4000 L/W in Brugelette, Belgium

BMA's vertical pulp press program is based on 2 different screen diameters (3000 mm and 4000 mm) and 3 different lengths of the spindle: 9,900 mm, 11,900 mm and 13,900 mm. In addition to these 6 combinations BMA offers 2 new different spindle geometries with different gaps between the spindle and the outer screen. The new type "W", which stands for "wide gap", is for those applications that only require a low dry substance content of the pressed pulp, however, in combination with a high capacity.

During commissioning many tests were made and the results of the extensive measurements of throughput vs dry substance are summarized in table 1.

	Ochsenfurt HP 4000 L	Brugelette HP 4000 L/W
Average throughput [t/h]	33.6	55.4
Average dry substance [%]	30.8	25.6

Table 1: Test Results in Ochsenfurt and Brugelette

During the tests in Brugelette the addition of gypsum was low and not always constant. It is quite possible to operate the HP presses without adding any gypsum. This will certainly be of special interest to those factories that do not need to dry their pulp. However, this will reduce the performance of every press to a certain extent.

Based on the test results with the new presses the performance diagram of the range of BMA's vertical pulp presses had to be redrawn, and is shown below in diagram 1:

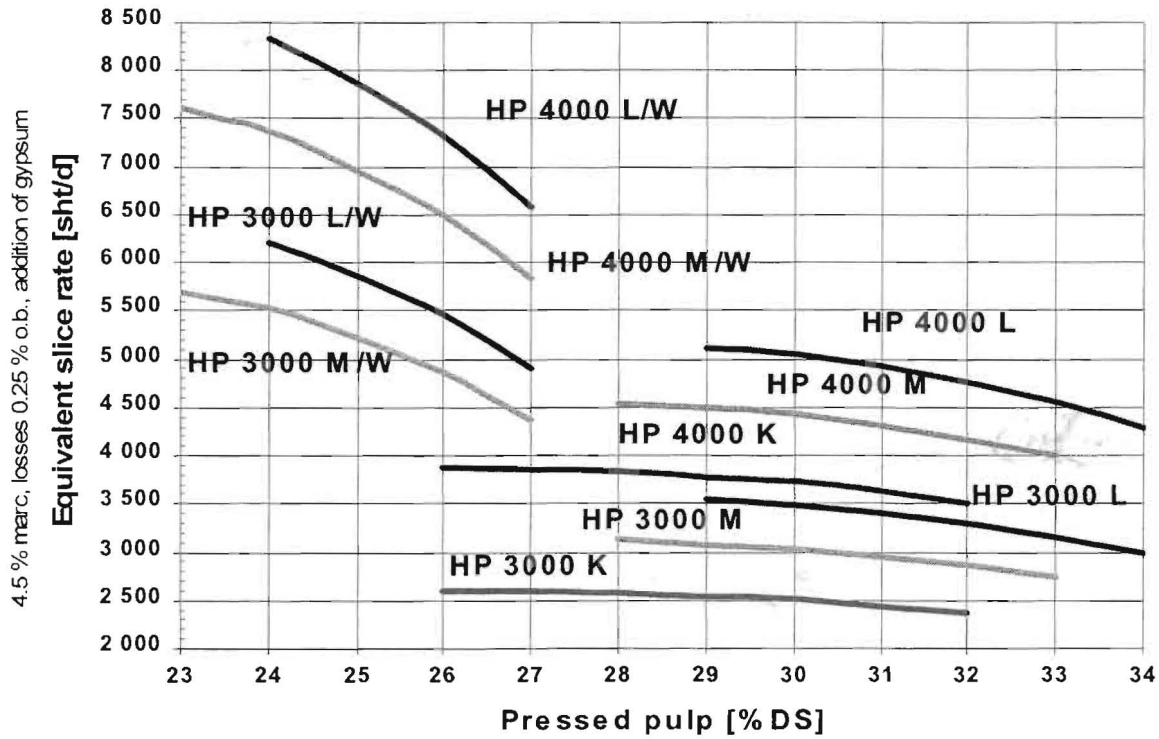

Diagram 1: Slice rate vs. Dry substance

The impact of extraction temperature, pH and hardness of juice are known and can be illustrated defined. However, the test again showed that factors such as an even discharge of wet pulp from the extraction tower, the quality of the cossettes and the dry substance of the wet pulp have a significant impact on the operation of any type of pulp press. Additionally, the structure of the processed beet is an unknown factor and an ever changing parameter. The mark content varies within a region during the time of harvesting and we again experienced that the time between harvesting and processing has a definite impact on the extraction process and the pulp presses.

BMA's new extended program of vertical pulp presses proves that it matches the requirements of factories with different market requirements for their pulp, as the two factories presented in this paper. Further research is required in order to determine the impact of the a.m. factors on the operation that until today cannot be calculated. BMA will be continuing their research into these factors, and will report on these at future opportunities.