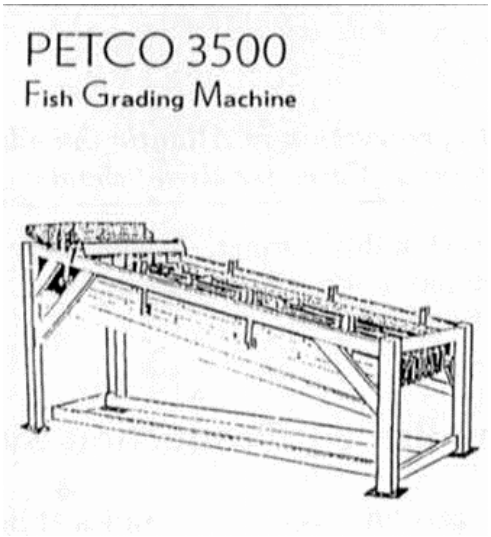

Improving Production At Beothic Fish Processors Ltd.

"The Pelagic processing area at the plant in Valleyfield, Newfoundland, has not worked out as well as we had hoped for processing capelin," identified the General Manager of Beothic Fish Processors Ltd. "Although the company continues to be very successful, if we are to offer competitive prices and still earn a profit we must keep our production costs as low as possible, and given that production costs are a function of production efficiency, it is imperative that we improve our present production system. It appears to me that we must look carefully at our existing plant layout to accomplish this."

Company Background

Beothic Fish Processors Ltd. (Beothic) was one of the largest processors of pelagic (capelin, mackerel and herring) fish species in Newfoundland and Labrador, with capelin being, by far, the primary species. Although the company began in 1967, it was not until 1979, when a modern cold storage facility was constructed at Valleyfield, and new blast freezers were installed, that the company was able to handle capelin. By 1989, capelin was a major contributor to Beothic's overall profitability.

By Newfoundland standards, capelin processing was a relatively new fishery, having been developed about thirty years ago. Originally, capelin were sorted by hand, however, it proved impossible to handle the enormous quantities demanded by the market in this manner. The industry soon turned to the use of mechanical sorters which, although not perfect, were able to process large quantities quickly and at relatively low cost.

The Present Production System

The capelin processing facilities at Beothic are illustrated in Exhibit 1. Capelin entered the system via a water-filled infeed hopper, labelled as 1 on the exhibit. At this point, the insulated containers used for transport were simply emptied into the hopper. They then proceeded along a conveyor belt to the mechanical separator -- a Petco 3500 (2). The separator consisted of a series of ribbed slots, which gradually increased in size, that the capelin were shaken across. The very small capelin fell out first, and were conveyed back to the offal area where the unusable portion of the raw material was collected (3). The intermediate sized capelin, which were the marketable females, fell through next, and were conveyed to the distribution tables (4). The capelin, which were primarily male, proceeded to the end of the separator and joined the small females on the conveyor as offal. At each distribution table, which was actually a conveyor, approximately 18 workers removed by hand

and discarded any unsuitable product that was not eliminated mechanically. At the end of each table (5), the capelin fell into boxes, which were hand-carried to the weighing stations (6). At this point, the boxes were checked to ensure that predetermined weights were contained in each. Boxes were then placed on a metal roller conveyor where they were closed and strapped. They were then placed on pallets, brought by forklift to the blast freezing area, and frozen to a temperature of -21oC, a process that normally took 12 to 16 hours. Pelagic species such as capelin were generally blast frozen unless these freezers were already filled to capacity.

As a variation on the blast freezing system, which would normally only occur when the blast freezers were completely full, plate freezing may be used. The capelin falling off the distribution tables (5) were caught in plastic pans, which were carried by hand to the weighing stations (6). After weighing, the pans were hand-carried to the packing tables (7), where they were emptied into cartons designed for plate freezing. Because in the plate freezing process the plates exerted pressure on the product, these cartons had to be placed in metal pans, which helped them retain their shape. The capelin were then transported by forklift to the main plant area for plate freezing. The metal pans were then manually removed from each frozen carton of product (the "knocking out process"), and the product stacked on pallets for cold storage. The additional handling required by this type of freezing increased unit labour costs and could potentially damage the product, thus making it relatively unattractive to the processor.

Problems of the Present System

Shortly after preparing this description of his capelin processing facility, the General Manager held a planning meeting with the plant manager and three production supervisors. The purpose of the meeting was to review the pelagic production plan for the upcoming year, particularly with respect to capelin.

"As you probably know," he began, "the single most profitable species processed here at the plant is capelin. Because the season is so short, only three weeks at best, it is vital that production be maximized in that period. We have three blast freezers and several plate freezers. It is absolutely vital that these freezers be kept full. Too often last year, we were not at capacity during this period. I'd like to take each aspect of our capelin processing system and examine it for problems."

When the meeting had ended, the following list of problem areas were identified by the management group:

1. **Space:** All of the group agreed that the production area was extremely crowded with, as one of the supervisors stated, "people tripping over each other." Suggested solutions to this problem ranged from expanding the building to provide more space, to reorganizing the equipment in the present building to provide better working areas. The General Manager felt the equipment was poorly organized and that there were too many places on the line where the product had to be handled by people, thus increasing labour costs. He felt that if the equipment could be laid out in a straighter line many of these extra people could be eliminated and production could proceed more smoothly.

2. **The infeed system:** The supervisors were critical of the amount of wasted raw material caused by capelin falling off the beginning of the infeed conveyor to the offal conveyor below. A possible solution would be to simply move the hopper closer to the separator and to remove the conveyor completely.

3. **The distribution tables:** All three of the supervisors commented on the way that the distribution tables were organized. The inclined conveyor leading from the separator deposited the female capelin at one end of a table. They then had to be pushed manually to the ends of the distribution tables.

4. **The weighing system:** Another problem area identified during the meeting concerned the weighing system. Capelin arriving at the end of the distribution tables were caught in either blast freezer boxes or in plate freezer pans, depending on the freezing method to be used. They were then moved to the weighing stations, where sufficient capelin were added or removed to bring the package to the desired weight. Blast freezer boxes were then placed on the roller conveyor, where they were closed in preparation for transport by forklift to the freezers. In order to do this, the forklift operator had to maneuver around the packing tables. Although this was not a problem for a skilled forklift operator, it created a potential safety risk to those working in that area of the plant. As the plant manager put it, "they often worked with one eye on the job and the other on the forklift." When the product was to be plate frozen, the plastic freezer pans had to be carried from the weigh stations to the packing tables. There, the capelin were transferred from the pans to cardboard boxes, which, in turn, were placed into the metal freezer pans for plate freezing.

Conclusion

After reviewing his notes, the General Manager realized that his entire capelin production system needed to be reorganized. In general, there were two key items to be addressed. First, the movement of capelin through the plant from the raw material stage to finished product was generally inefficient. Secondly, he considered the critical problem of the plant to be an inability to keep its freezers working at full capacity. He knew that he needed to look at the overall plant layout to make appropriate changes to improve production at the plant.

This case was adapted from a case prepared by Professors Wayne King and Donna Stapleton as a basis for classroom discussion, and is not meant to illustrate either effective or ineffective management.

Exhibit 1

Existing Layout Of Processing Area