Design and Purchase of Specialized Imitation Crab Processing Equipment

Introduction

As global production of surimi (imitation shellfish) products increases, there is a requirement to operate state-of-the-art facilities that are cost-effective and use economies of scale in production. Atlantic Shellfish Inc., a Newfoundland surimi producer, recently expanded its operations using new processing technologies and designs. While the Company's facilities were sufficient for moderate production, major changes were required to increase capacity and to improve quality. A portion of the production lines in the Clarenville operation were outdated and did not permit optimum process flow. The layout of the processing line limited daily production and resulted in quality problems from excessive handling and bacterial contamination.

Competitors had already added new, specialized production equipment which were more cost-effective. In response to this immediate requirement for change, Atlantic Shellfish Inc. purchased and installed innovative technologies aimed at improving the overall efficiency and capacity of their operation. This was realized with funding from the Fisheries Diversification Program (FDP).

Background

Atlantic Shellfish Inc., a member of the Barry Group of Companies, produces imitation crab and fish products in Clarenville, Newfoundland. The company produces some of the highest quality products in Canada, distributing products all over the world. It recognized that in order to continue and expand in the global surimi business, it had to improve its processing technologies and expand production lines. Over the past five years, it has completed significant research and product development activities. Atlantic Shellfish Inc.'s process engineers determined that the individually quick-frozen imitation crab process could be simplified and significantly improved by installing an inline continuous steam cooker, complete with conveyor systems dedicated to allowing smooth and expedient process flow.
Other specialized equipment was also required. Additional capacity in the area of 30 to 50% was implemented to meet new market demands. Existing equipment was redesigned to facilitate increased production or discontinued to meet this objective. Local fabrication companies and Atlantic Shellfish Inc. engineers performed this task.

**Methodology**

Technology and process reviews were carried out by Atlantic Shellfish Inc. engineers. Quality and cost factors in production flow were reviewed and analyzed, which led to the engineering and design of a continuous cooker, conveyor system and other specialized equipment. A portion of new equipment was manufactured locally, while other specialized equipment was purchased from outside suppliers. Several test surimi products were produced following initial installation of the new equipment.

**Results**

The project resulted in a 33% throughput increase, as well as improved bacteriological levels due to reduced handling and process contact. The surimi product exposure and contact time with people and equipment were greatly reduced. Modifications were successful in eliminating bottlenecks and process flow, resulting in continuous and smooth throughput and an overall reduction in processing costs. New contracts, as a result of increased production, were secured and improved cost efficiencies have allowed the company to compete internationally, and as a result, increase the operating season in Clarenville by 10 weeks.

**Conclusion**

The design and purchase of specialized imitation crab processing equipment completed by Atlantic Shellfish Inc. has been very successful. The equipment and modifications made a significant improvement to product quality and throughput, which has resulted in increased efficiencies in the artificial crab line and improved market acceptability. The new technology allowed the company to use additional raw material in its surimi production, resulting in lower costs. This benefit, coupled with additional reduction in processing costs, has created a significant competitive advantage for Atlantic Shellfish Inc. in the global surimi market. The project has allowed the company to improve past production inefficiencies, thereby extending the season and creating new jobs.