# WELLS ENTERPRISES, INC.

**LOGAN CLARK**
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**COMPANY PROFILE**
Wells Enterprises, Inc. is the largest privately held, family-owned ice cream and frozen treat manufacturer in the United States. The company was founded in 1913 and is headquartered in Le Mars, Iowa, the Ice Cream Capital of the World. Wells produces more than 150 million gallons of ice cream a year, including its signature brand, Blue Bunny® and the iconic Bomb Pop®. Wells also manufactures licensed frozen treat brands including Weight Watchers® frozen novelties.

**PROJECT BACKGROUND**
This project aims to improve the efficiency of the compressed air system of the South Ice Cream Plant. Improving the one-line drawings of the system and finding air leaks are priorities for this project. The current one-line drawings are incomplete and need to be updated to show current in-plant design. Updated drawings will provide an accurate map for use in conducting air leak surveys and future maintenance of the system. On-going detection and repair of compressed air leaks will reduce the air demand from the compressors and lead to energy and cost savings.

**INCENTIVES TO CHANGE**
The last full update to the plant one-line schematic drawings of the compressed air system was completed in 2003. The one-line diagrams are used as a map and documentation for plant air leak surveys. Any compressed air lines in new or changed areas of the plant were not documented on the diagrams and therefore not included in the leak detection surveys. Updated drawings will allow for more complete identification and repair of the detected leaks. A leak that produces 30 decibels of noise accounts for approximately 2,800 kWh per year of electricity. This internship represents the opportunity to do more in-depth and comprehensive surveys in the future, leading to reduced energy usage and associated costs.

**RESULTS**
**Compressed Air System Drawings:** Growth, expansion, and improvement projects have led to changes in the compressed air system that were not documented on the existing drawings. Updates were made to the existing one-line drawings to ensure they were current and accurate. Necessary changes were found on all pages of the existing drawings that were provided. Five new pages of piping diagrams were added to account for new expansions that were undocumented. In addition to increasing the accuracy and savings potential of future air leak surveys, these updated drawings will be useful to engineers and project managers as they do project planning at the facility.

**SICP Compressed Air Leak Detection and Repair:** A leak detection survey of the South Ice Cream Plant (SICP) revealed leaks representing an air loss of 305 cfm of air. This air loss requires the compressors to use an extra 526,890 kWh of electricity. Repairing these leaks will reduce the load on the compressors and channel more air toward intended production uses. The most frequent problem came from leaks occurring through the threads of fittings. In the future, using thread sealant on all the threaded connections will help reduce the number of leaks.

| PROJECT | ANNUAL COST SAVINGS | ENVIRONMENTAL RESULTS | STATUS |
|---|---|---|---|
| COMPRESSED AIR SYSTEM DRAWINGS | $19,300 (one-time) | N/A | IN PROGRESS |
| SICP COMPRESSED AIR LEAK DETECTION AND REPAIR | $21,075 | 526,890 kWh | IN PROGRESS |
| ENGINEERING CENTER COMPRESSED AIR LEAK DETECTION AND REPAIR | $2,955 | 73,888 kWh | IN PROGRESS |
| INTENTIONAL LEAKS | $2,555 | 127,754 kWh | RECOMMENDED |
| INFRARED SURVEYS | $900 | N/A | IMPLEMENTED |

**Engineering Center Compressed Air Leak Detection and Repair:** A leak detection survey of the Engineering Center resulted in finding leaks representing an air loss of 43 cfm of air. This amount of air loss translates to an additional 73,888 kWh of electricity used, annually. As with the SICP, repairing these leaks will reduce the load on the compressors and improve the operating efficiency. Most of the leaks in the Engineering Center were identified at quick-connect fittings used with most hand tools. Many of these leaking fittings have already been replaced and work was done to identify an alternative fitting that would have a lower leak potential.

**Intentional Leaks:** Some production lines use compressed air to blow empty wrappers or ice cream off of the conveyer belt. These air blowers are always open, often times when the line is not running. Visual sensors installed on the lines could activate the blowers when production is running and deactivate them when production is not running on a particular line. In addition to reducing energy consumption when a line is not in use, the quality of the air pressure supplied to other lines would improve.

**Infrared Surveys:** The transformers that supply power for Wells Enterprises Inc. are opened once a year for an infrared survey of the connection points. Because the boxes are owned by the utility provider, they must be opened only by utility company staff and not by Wells. While the transformers were open, all information on the transformers and connection points were documented and entered into a master spreadsheet. Specifications and connection point information on the transformers will now be accessible year round instead of just the one time annually that the transformers are opened.