HINZ
A Rockwell Automation Company

AltaSteel Limited
Bar Mill Recipe Manager

The Client:

AltaSteel Limited manufactures steel by recycling steel scrap. The operation includes an electric furnace, steel making shop and a bar mill in Edmonton. The products include flat, round and square reinforcing bars, which are used by mining, automotive, construction and oil and gas companies throughout North America. Current steel making capacity is 375,000 tons of semi-finished steel per year.

The Requirement:

The purpose of this project was to retrofit an existing Human/Machine Interface (HMI) with a recipe management module. This HMI was used to control the bundling system which bundles the finished bars for shipping. For each batch of product the operators had to enter specific bundling parameters (also referred to as a recipe) into four separate screens in the HMI These attributes include conveyor speeds, tie positions and type, machine position and vertical transfer values. The parameters were contained exclusively on handwritten sheets, and operator experience often resulted in recipe variations. The old system did not contain a method of tracking changes, so the most effective control parameters were not known. The old system also required that "confirm" buttons on multiple HMI displays be pressed before a recipe would execute.

Hinz was required to provide a means of simplifying the system and tracking recipe changes.

Functionally the system must include:-

- Recipe selection by means of mouse selection, or matching closest recipe name by keys pressed.
- The ability to display all of a recipe's parameters on a single page. Viewing the entire recipe at once allows for quick verification that all of the parameters are correct.
- A means of downloading the recipe displayed on the single screen to the PLC with a single mouse click instead of confirming in various displays of the HMI.
- The capability to modify recipes as required, deleting recipes entirely as products become obsolete, and adding new recipes.
- A method of tracking modifications, describing the benefit of any changes made to the recipe. This allows the operators to see the reason behind changes made, eventually leading to an optimum combination of parameters.
- A database to house all of the existing recipes. Use of this database will lead to uniformity of recipes.
- A reporting mechanism to print a report of changes

The Design Solution:

AltaSteel uses Wonderware InTouch throughout their facility as the HMI of choice. Preliminary engineering considered the implementation of the recipe manager included with InTouch, however it was determined that it would not satisfy the custom nature of the project requirements. FoxPro was chosen to hold the recipe database by the client for compatibility reasons, and Visual Basic was chosen for the application programs. Visual Basic is object-oriented programming, which allows for fast design and screen prototyping. In addition, the code compiles to small, fast, executables free of licensing fees. FoxPro, Visual Basic and Wonderware were linked via Dynamic Data Exchange (DDE) and ActiveX Data Objects (ADO).

A FoxPro database was created and the client populated it with the existing recipes. Then three Visual Basic applications were created. The first, called 'Recipe Select' was created to allow the user to select a recipe from a scrollable list and then display its parameters in entirety on a single display.

The second application was called 'Recipe Modify' and it allowed the operators to add a new recipe or select the desired recipe from a scrollable list and either delete it or modify some of its parameters. When a recipe was modified, the date of modification was automatically entered into the database and the user was prompted to enter a revision description. The third Visual Basic application created a revision report. The revision report application searches through the database and prints the name and revision description of any recipes that had been modified that day. Scripts and buttons were added to the existing Wonderware application to seamlessly implement the new Visual Basic applications.

As requested, the original system integrity remained intact, allowing the operators to learn the new system at their own pace, or use the original recipe functions that remained in the system. This decreased anxiety and problems that can occur when a new system is implemented.

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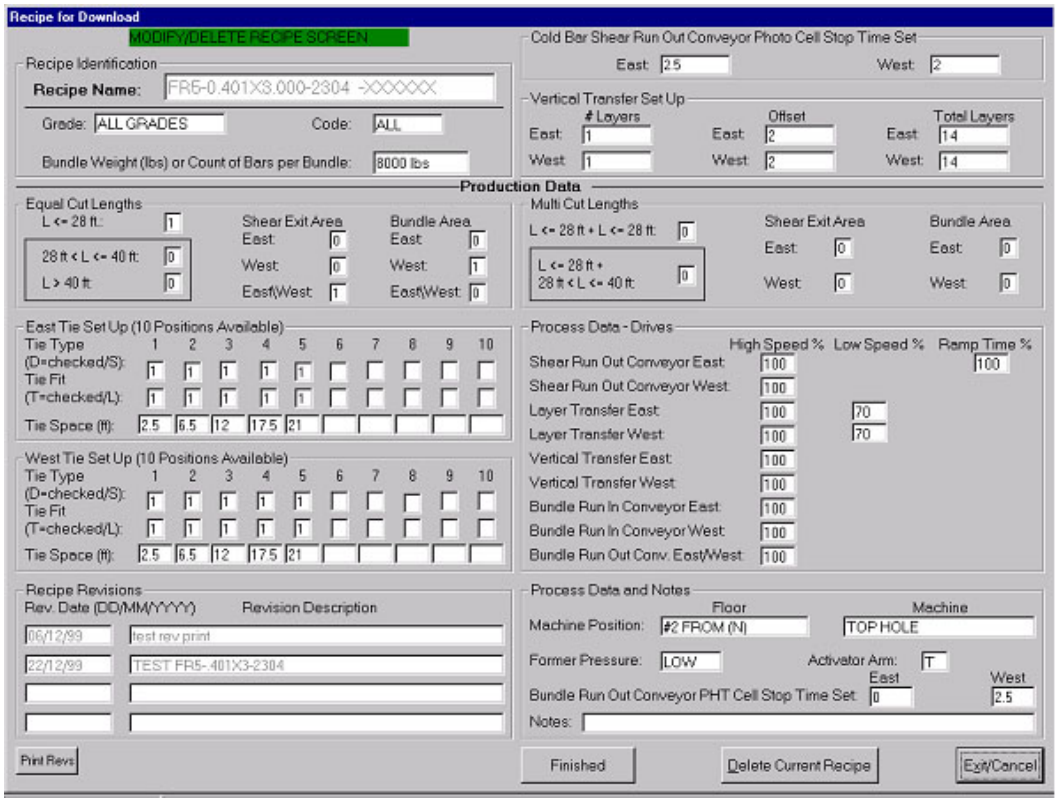

System Specifications:

- Wonderware InTouch Version 7
- Visual Basic 6.0
- Windows 95 based Industrial PC
- Connected to a Modicon 984 PLC
- 200 Recipes Expandable to 10 000

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com