

## Bliss Press Control System Upgrade

For

Firth Rixson Forgings Limited (Meadowhall)



### Project Summary

#### Introduction

Inspec Solutions have recently completed commissioning of a new control system for the 1500 ton Bliss piercing press at Firth Rixson Forgings' Meadowhall site.

The control system uses an Allen Bradley ControlLogix processor and I/O modules to control and monitor all of the hydraulic pumps and valves. The operator interface is configured using Rockwell RSView32 SCADA running on two ruggedised touch screen PCs. The PCs are mounted on a desk along with pushbuttons, Led's and joysticks for manually operating the press.

As well as controlling press movements manually, the control system allows operators to program in a sequence of pre-defined movements to automatically forge a particular job. These programmes are stored in a central database and can be easily retrieved for future use. Critical parameters logged during the forging process are also stored on this central database.

The system also provides comprehensive monitoring and diagnostics allowing any mechanical or electrical problems to be quickly found and cured.

#### Control System

The main aims of the upgrade were to provide improved reliability of operation, and better repeatability in terms of the forging operations performed.

The first step towards improving reliability was choosing suitable hardware – Allen Bradley ControlLogix is well known throughout the control systems industry as a reliable platform which will perform faultlessly for many years. I/O modules were also relocated away from the press and pump room to reduce the likelihood of failures caused by the extremely harsh environment.

### The Press in operation

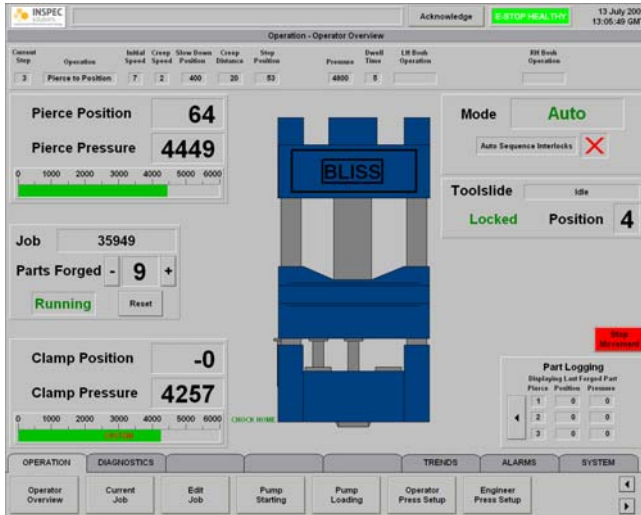


Programming of the system was also important. Structured programming techniques have been used to aid future maintenance and modifications by making the software easily understandable by anyone familiar with Rockwell programming software. Functions have also been added to cope with issues inherent in the hydraulics and mechanics such as non-linear pressure relief and position measurement errors under load.

One of the main factors in producing consistently accurate forgings is the depth of the final piercing operation. This has been improved by monitoring the speed of movement of the pierce tool during the operation, and using this to adjust the final stopping point.

## Operator Interface

All of the critical information required by the operator during the forging process is displayed on a single screen in both numeric and graphical form. This includes positions and pressures of the main press components, and also details of the current operation when running in automatic mode.



Programming of the forging sequence can be carried out entirely from the touch screen terminals, with keyboard pop-ups appearing whenever data entry is required. User-friendliness of the interface has been improved by allowing all options to be selected by clicking buttons, and showing the allowed limits for any data entry.

All other screens can be easily accessed from a tabbed navigation bar at the bottom of every screen.

An alarm banner at the top of every screen shows critical alarms, and allows navigation to the relevant screen by simply clicking on the alarm banner.

## Maintenance

Several features have been incorporated to improve maintainability of the system.

As well as comprehensive alarms, all movements and sequences have an interlock healthy symbol showing whether the particular operation is currently available. Clicking on this will bring up a popup which shows the detail of why the interlock is not healthy.

All valves and motors can (under password protection) be put into manual mode and controlled from the operator interface. Going a level further down, all controller I/O points can be monitored and digital inputs and outputs can be overridden and forced into a particular state.