

# Enhanced Process Backup Control System

## Injection Molding Ejector Pin Inspection System

A Tier I automotive parts supplier of injected molded parts required a more robust solution to the existing injection press limit switches. The press cycle involves the closing of the tool, injecting the material, opening the tool and ejecting the newly formed piece. The new piece is pushed off the surface of the tool face by ejector pins and lifting shoes. After the robotic arm removes the piece, the ejector pins retract to begin the cycle again.

On occasion the limit switches associated with the ejector pins fail, allowing the possibility of extended ejector pins at the end of the press cycle. The ejector pins and/or lifting shoes cannot be more than 2 mm off the surface of the tool after they have been retracted, or they will damage the grained surfaced of the tool, causing press downtime and significant repair costs.

The project team provided application development, product procurement, assembly and installation, as well as services for project management, commissioning and training. The tool surface was divided into four visual inspection zones. Four DVT 510 Legend Cameras, each with a 16 mm lens, were individually enclosed in air purged NEMA 4X enclosures with 6 LED IRDA lights.

The trigger for the cameras to inspect the mold was driven from the Injection Press control system. This trigger would initiate the process of capturing the images of the tool surface, and with the use of DVT soft sensors, inspect those images for surface anomalies, i.e. protruding ejector pins. In the event the ejector pins were

flush with the surface of the tool, the vision system would return an "inspection passed" signal back to the press and the molding process would continue. In the event the vision system detected anomalies on the tool surface, an "inspection failed" would inhibit the press from continuing the cycle and notify the operations staff.

Current enhancements have been underway to make the system data available to management at their networked desktops.

