

Integrated Safety for the Production of Ford's New Falcon FG

Siemens Safety Integrated products and systems play a central role in the safe production of doors for Ford's new Falcon FG. Safety Integrated is the consistent implementation of safety technology in accordance with the Siemens' Totally Integrated Automation (TIA) concept, a comprehensive and consistent product and system portfolio for automation.

Siemens TIA reduces expense and saves time because it combines safety and control functions in one integrated system. This makes it possible to connect moving components and safety devices in the door production process with less cabling. The result for Ford was reduced commissioning time and cost. In addition, Siemens HMI devices give a clear and constant diagnostic picture of both the control and safety functions of the operation.

Planning Safe Production of Ford's Newest Falcon

The Ford Falcon has been manufactured in Australia since 1960. The longevity of its production makes it the biggest selling brand in Australian automotive history. The seventh generation of the car, the Falcon FG, was unveiled in May 2008.

The design of machinery and plant equipment for production of the Falcon FG had to meet Ford Australia's rigorous safety requirements and the updated standards under Australian safety of machinery standard AS4024.1 2006 category 3, which requires that a single fault does not result in loss of safety functions, and that a single fault must be detected as far as reasonably practicable.

These stringent guidelines have been applied in the design and operation of the door manufacturing operation in Broadmeadows, Victoria. The facility includes two sub-assembly cells where rear door components are robotically spot welded and another cell where front doors are pressed and welded. All areas are protected by perimeter fences.

Integrating Standard Operating and Safety Technology

Dual-PLC and dual network control architectures are found in many automobile plants. These have one system for standard logic control and a separate, parallel system for safety devices. The two-bus architecture requires substantially more wiring, training and network access hardware. It also makes start-up and troubleshooting more complicated.

After reviewing the options, engineers at Ford saw the advantages of using Siemens Simatic in the door assembly operations. An integral part of the door assembly operation is the Siemens S7-315F Failsafe PLC, which combines standard operating automation and safety technology within a single controller.

In the rear door sub-assembly line, light guards protect the operator who manually loads components onto a turntable. Light grids and light curtains immobilise the turntable and depressurise valves while the operator loads the parts. When the

operator steps away from the protected area, the turntable rotates to transfer the parts into the cell where they are robotically welded. Light guards also protect forklift access areas where finished parts in stillage are unloaded.

Safety interlocks regulate the robot, fixture solenoid valves, servo turntable drives and overall air dump solenoid valve, according to the signals from light guards, controlled access gates and emergency stop buttons.

Reaping the Benefits of Safety Integrated

Ingo Eckardt, a Facility Engineer at the Falcon production plant, said Siemens Safety Integrated provides flexibility for improvements and modifications. "The flexibility is certainly a benefit. You can commission in stages and include safety appropriate to each of the stages."

"Safety Integrated is designed to work as one," he said. "It provides a broad range of safety devices that can easily be integrated. You also get increased uptime through improved diagnostics."

Siemens Safety Integrated delivers several benefits in the operation of door welding cells. Significantly less cabling and fewer connections are required because standard automation and safety data are combined on a single network. This also means that less programming and commissioning time are needed, resulting in reduced costs. In addition, a common HMI communicates with the Siemens PLC for safety as well as control data to provide highly detailed diagnostics.

The front door line, includes a press with an S7F safety controller, enclosed in a robot cell. Siemens ET 200 S distributed I/O simplifies configuration and makes it possible to reduce the size of operator control centre boxes. The integration of technologies delivers substantial savings in wiring. The compact design results in significant space savings in the control cabinets.

Justin Farrell, Business Manager, Siemens Safety Systems, explains the benefits of the ET 200S remote IO system for the control centres.

"Rather than having to wire control and safety functions, such as drive lights and on/off buttons and emergency stops, through a larger conduit back to the main control panel, you can have short wires to the remote I/O with a single network cable running back, so there is less wiring," he said.

"The benefit of the ET 200S is that you have one cable coming into it and one interface to the cable. The system is modular and expandable from 4 to 100 plus I/O, allowing for reduced spare parts holdings and common designs for small to large requirements."

ENDS

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