A Presentation By:

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Industry Overview

❖ **The goals for any commercial or industrial process are simple:**

- Minimize overall costs and enhance productivity.
- Optimize plant operation.
- Reduce downtime.
- Decrease direct labor.

❖ To achieve these goals:

❖ Processes require better monitoring, scheduled downtime, and faster maintenance.

❖ Obtaining real-time process information requires integrated hardware, software and communications solutions.

❖ Communication and advanced sensing technologies now exist at the device level, and recent enhancements make a completely integrated solution both usable and affordable.

What is MCC

United States of America

❖ Motor Control Centers [MCCs] occupy a prominent role in control schemes, housing all of the motor starters & comprehensive array of control and monitoring devices.

Middle East & East Africa

❖ Motor Control Panels [MCP]. IEC style starters with solid state overload relay.

Everything in one big modular and expandable panel.

Current Technologies allows the use of "smart" components in your current MCP design.

This presentation focuses on what we have done in America to our MCC to optimize plant operation.
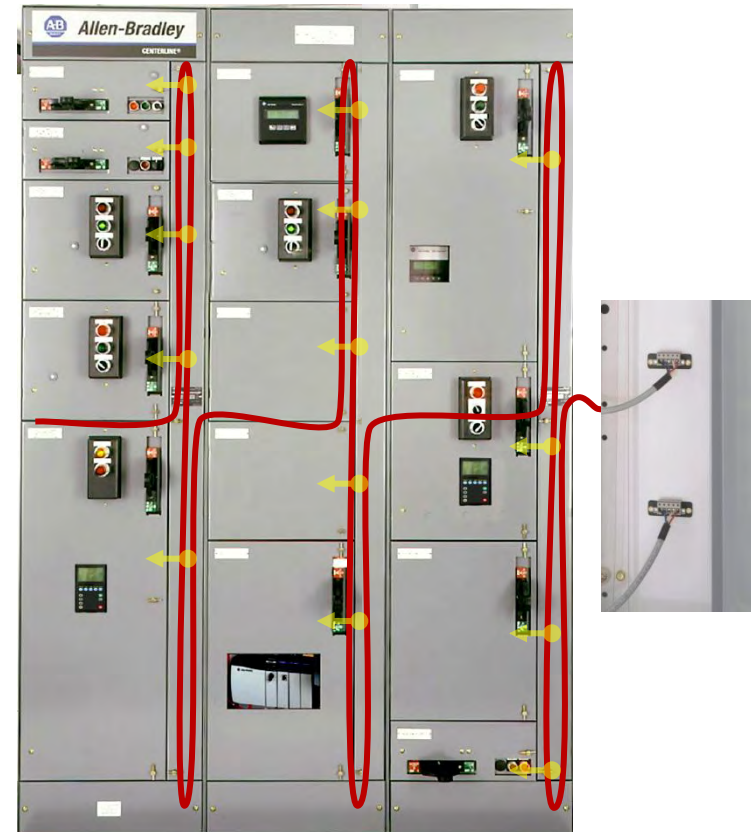
What is Smart MCC

❖ An integrated hardware, software and communication solution.

❖ Provides real-time data, trending, component history, wiring diagrams, user manuals and spare parts.

❖ Reduces installation time with its plug-and-play set-up and minimizes facility downtime by quickly providing intelligent diagnostic and predictive failure information.

❖ Proven open network DeviceNet, eliminating the bundles of control interwiring typically found in MCCs.

❖ Each smart MCC section features six built-in DeviceNet ports, allowing for easier installation, relocation, and adding of new units - all without having to interrupt the operation of adjacent units.
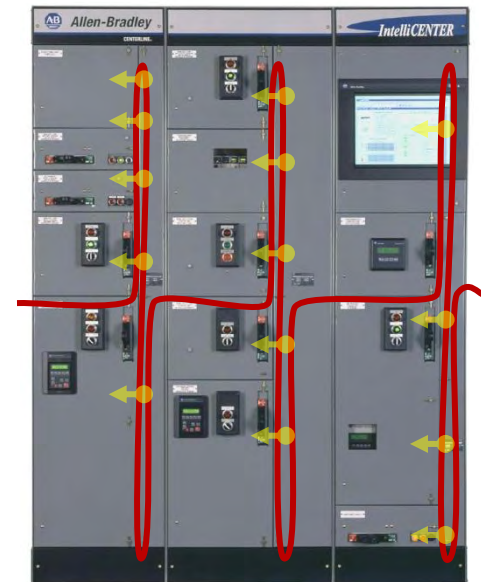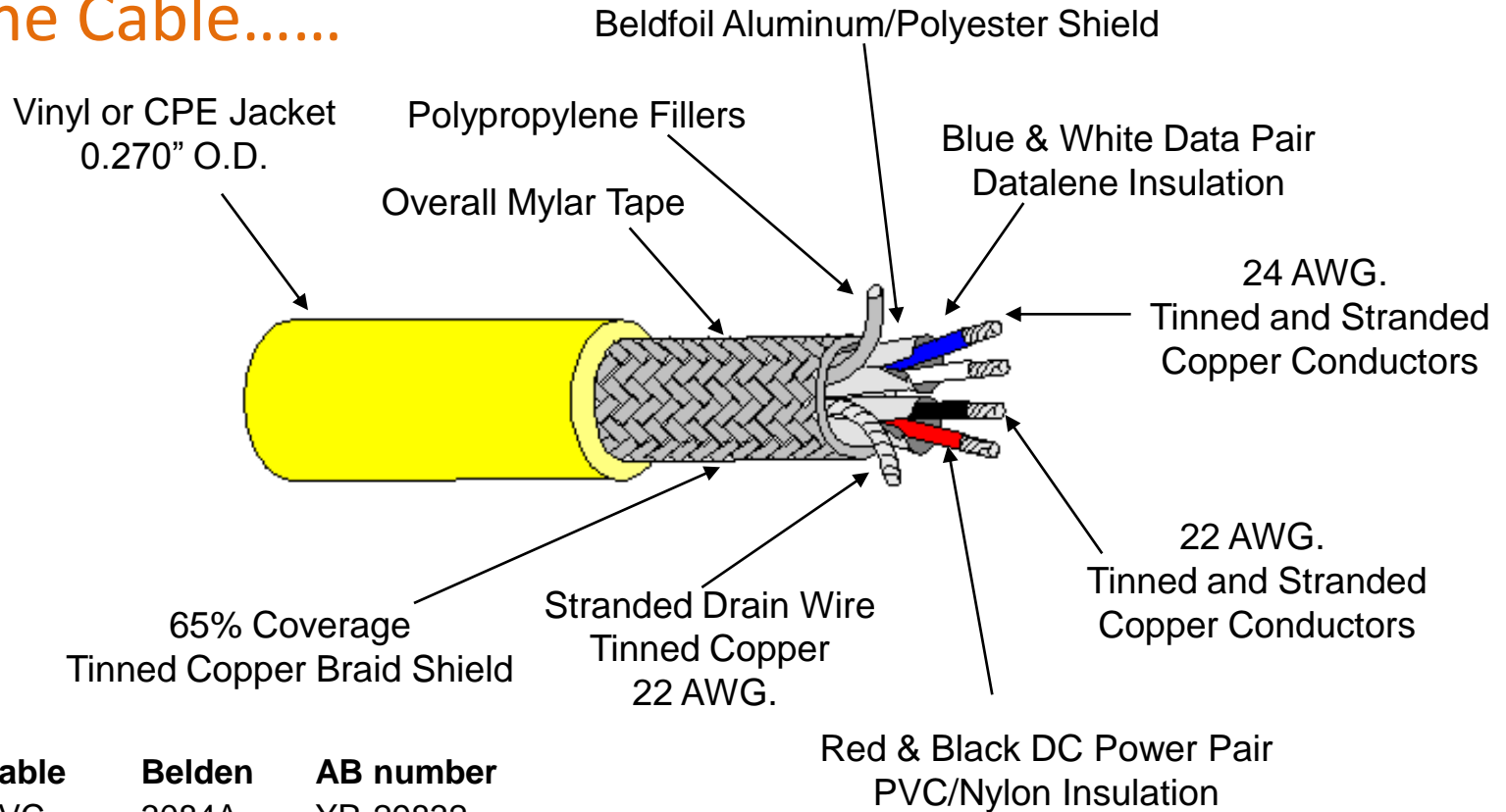
Smart MCC Design----Cost Savings

❖ Save up to 90% on wiring installation time.

❖ No Digital I/O for motor, no current transducers to analog inputs.

❖ Technology's proven, pre-wired and validated network.

❖ Network devices are pre-configured with node addresses and baud rates – ready to communicate so you can configure device parameters (e.g. acceleration time, full load amps, etc.) via the network.

Smart MCC Design----Cost Savings

One Cable……

Beldfoil Aluminum/Polyester Shield

Vinyl or CPE Jacket
0.270" O.D.

Polypropylene Fillers

Blue & White Data Pair
Datalene Insulation

Overall Mylar Tape

24 AWG.
Tinned and Stranded
Copper Conductors

65% Coverage
Tinned Copper Braid Shield

Stranded Drain Wire
Tinned Copper
22 AWG.

22 AWG.
Tinned and Stranded
Copper Conductors

Red & Black DC Power Pair
PVC/Nylon Insulation

Thin Cable	Belden	AB number
Grey PVC	3084A	YR-29832
Yellow CPE	3085A	YR-39660

Smart MCC Design----Safety

**Smart MCC Technology features
help you meet your safety goals:**

❖   Use network access to configure and
troubleshoot devices without opening
enclosure doors – reduce personnel
exposure to hazardous energy levels
and the need to "suit up" for routine
maintenance

❖   Intelligent motor controls within
the MCC can warn of failures before
they occur – allowing you to react
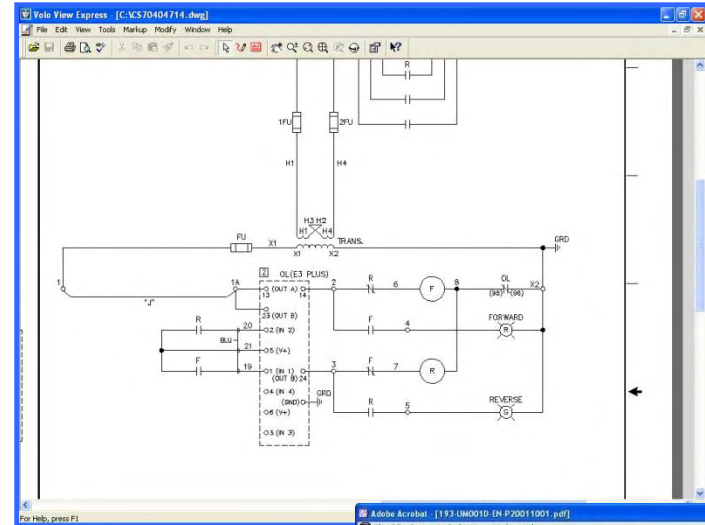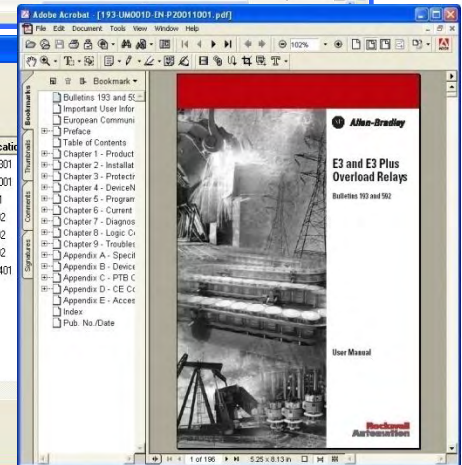with a safe, orderly response to
unexpected situations
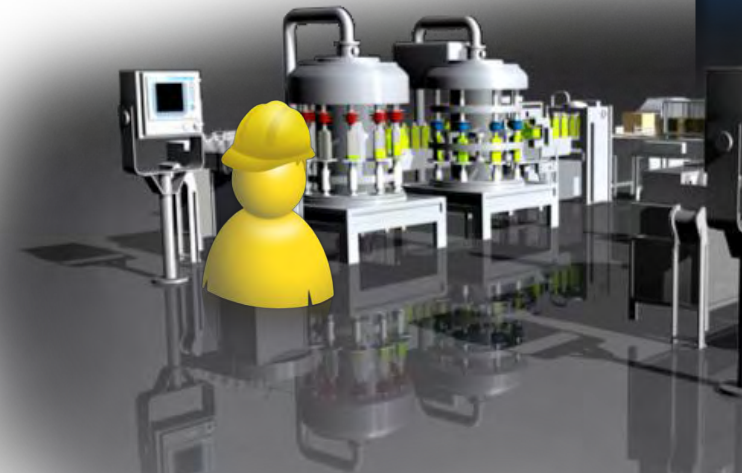
Smart MCC Design----Features

IMPROVE DIAGNOSTIC

❖ Smart MCC Technology can help keep your facilities up and running with electronic documentation, remote diagnostics, predictive maintenance and easy replacement of MCC units.

❖ The Smart MCC Software includes electronic versions of all critical device manuals, wiring diagrams and spare parts so information for troubleshooting is just a few clicks away.

❖ A replacement, plug-in smart unit can be installed quickly – without disrupting power or communication with adjacent units.

❖ Advanced communication architecture allows remote troubleshooting from anywhere within the enterprise network.
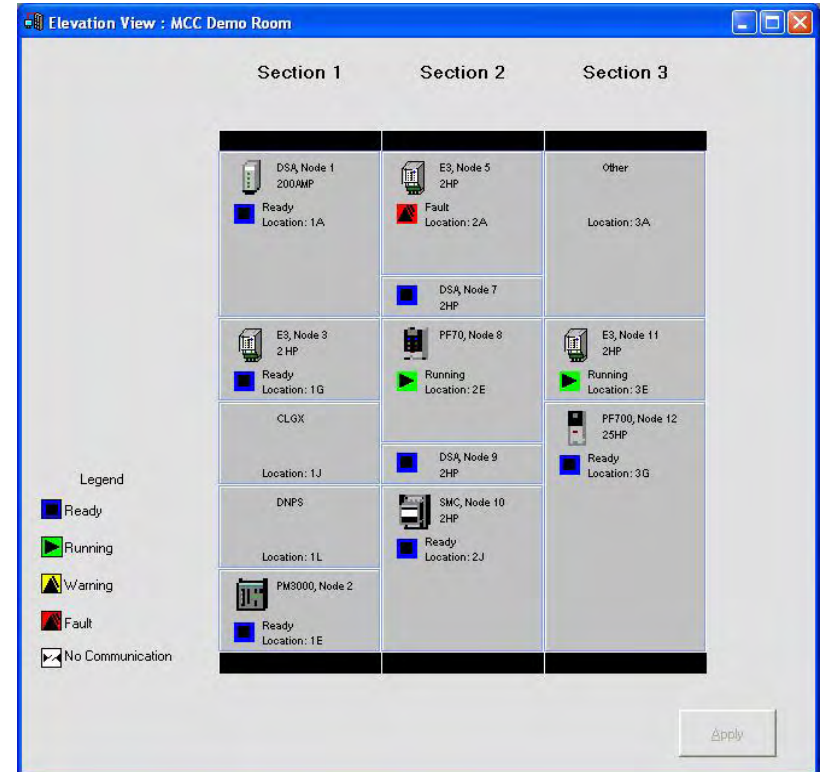
Smart MCC Design----Features

MCC Elevation View

◆ Shows MCC sections and status of each motor starter

◆ Devices can be moved by simple drag and drop

◆ Device descriptions and locations are fully customizable

Smart MCC Design----Features

E3 Plus Solid-State Overload Relay

- ❖ DeviceNet communication On-board
- ❖ 2 input points (4 inputs in Plus version)
- ❖ Programmable protective functions (alarm level, trip level, time delay, and inhibit window)
  - ◆ Overload
  - ◆ Phase loss/imbalance
  - ◆ Stall/Jam
  - ◆ Ground Fault (Plus version)
  - ◆ PTC thermistor inputs (Plus version)
- ❖ Information:
  - ◆ Running Amps (Current)
  - ◆ Time-to-trip
  - ◆ Time-to-reset
  - ◆ Percent thermal capacity

Smart MCC Design----Features

❖ **Monitor View**

◆ Detailed information

◆ Three gauges

◆ Two trends

◆ I/O status and descriptions

◆ Eight data/parameters

◆ All parameters are fully configurable by the user

Smart MCC Design----Features

Smart MCC screens can reside in HMI Application. Use of ActiveX makes this possible.

Reduces HMI development time and gives the user better information
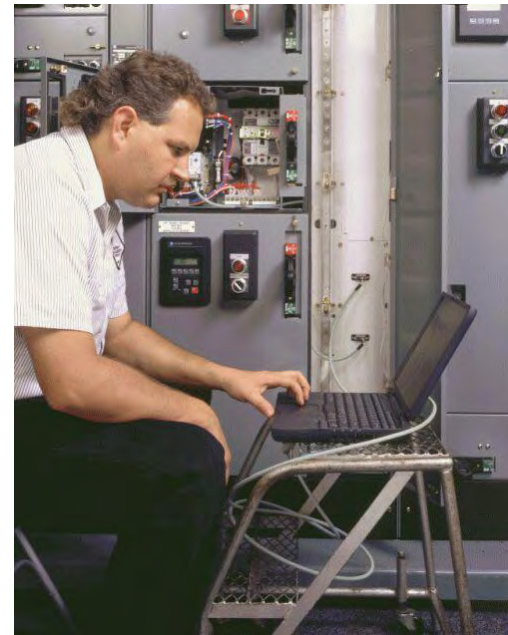

MCC Elevation View

Unit Monitor View

Electronic User Manuals

Electronic CAD Diagrams

Spreadsheet View of MCC
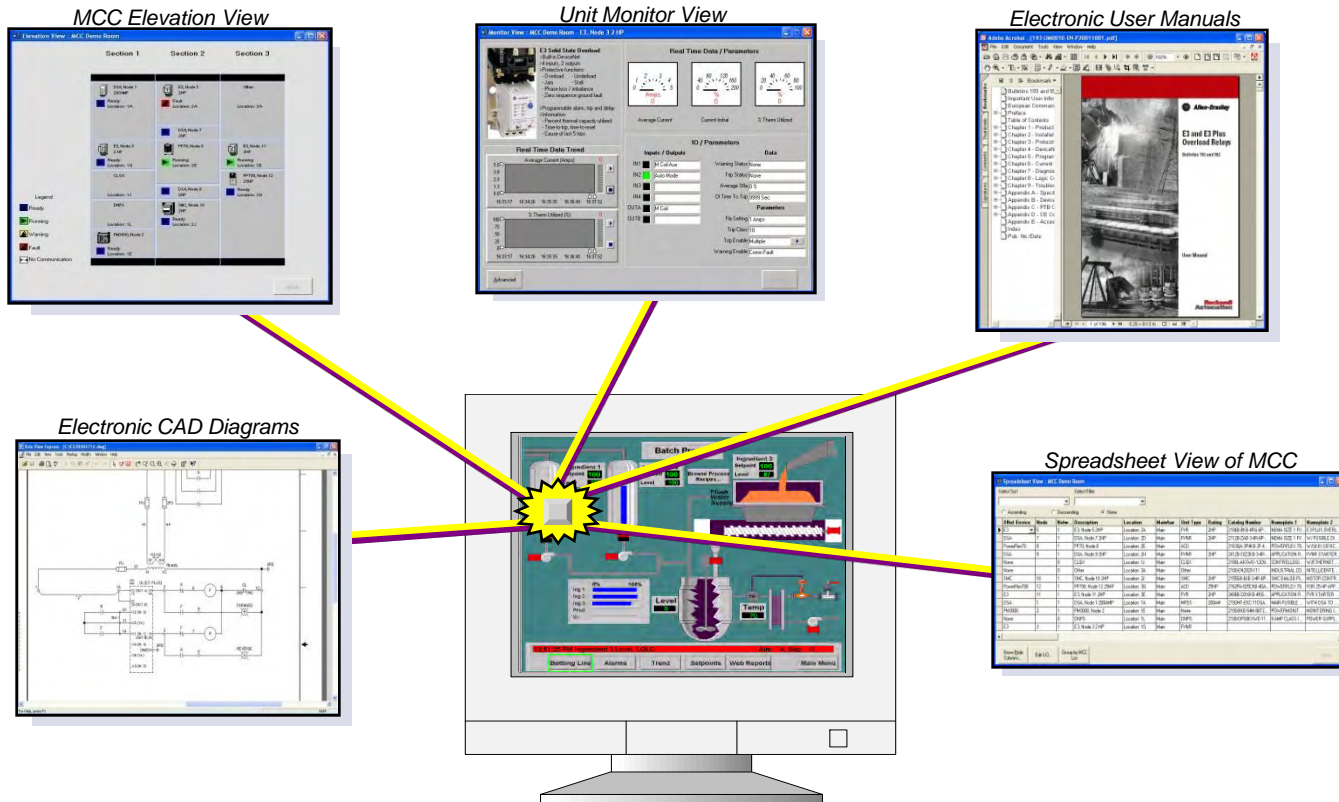
Smart MCC Design----Features

❖ **Before Shipping**

- ◆ System configuration and Testing done at the factory

- ◆ Nodes addressed are assigned.

- ◆ DeviceNet Network powered up.

- ◆ Component communication and functionality verified

Smart MCC Design----Case Study

Cargill- Horizon Milling 960T Mill & CH:

❖ Biggest Single Milling Unit in America.

❖ 350 Motors with 82 VFD.
❖ Eliminated:
▪ 700 Digital I/O Points on motors.
▪ 82 analog outputs for VFD Speed Reference.
▪ 60 analog inputs for the running amps on motors.
▪ Saved on all the control inter-wiring.

Result:

Provided a better solution with best up-time with no added labor.

New Flour Mill Design Criteria….

❖ 1. Location of transformers and MCC / MCP rooms.

❖ 2. Use of SS and VFD strategically.

   [New SS and VFD are technically improved, moderate price increase. You pay once but you gain in both improve PF and motor efficiency].

❖ 3. Pay attention to Actual power consumption vs. installed kW. Minimize oversized motor.

❖ 4. Use of premium efficient motors as "standard".

❖ 5. Design around Intelligent MCC/MCP.

❖ 6. Instrumentation & sensors on smart network instead typical discrete I/O. Saving on conduit and cables.

Bottom line…..

❖ Design a System that meets your production and business goals.

❖ Implement the right & up to date architecture to optimize your automation assets with predictive, preventive, and reactive maintenance methods.

THANK YOU-SHUKRAN-ASANTE

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