T28 – Introduction to GuardLogix Integrated Safety Systems
Agenda

- Safety Perspectives
- Company Perspectives
- Evolving Technologies
- Integrated Safety
- Closing Comments
Traditional Perspective of Safety:

Safety and Productivity are Mutually Exclusive Objectives

SAFETY

Reduced Machine Utilization
Reduced Operational Efficiency
Increased Labor Costs
Increased Mean Time To Repair
Increased Nuisance Shutdowns

PRODUCTIVITY

Belief is safety = increases cost and impacts productivity.
The Perception of safety has changed!

In the past, Safety was seen as counter-productive, now it's seen as an ENABLER and is a key factor to success.

SAFETY
- Reduced Machine Utilization
- Reduced Operational Efficiency
- Increased Labor Costs
- Increased Mean Time To Repair
- Increased Nuisance Shutdowns

PRODUCTIVITY
- Improved Machine Speed & Utilization
- Improved Operational Efficiency
- Reduced Maintenance Downtime
- Reduced Nuisance Shutdowns
- Reduced Healthcare & litigation costs
A major reason for the change in perception is because of the improvement in technologies.

In the past safety was difficult to apply and hard to troubleshoot but now:

**Basic Safety**
- Cumbersome
- Difficult to Apply
- Inflexible
- Difficult to Trouble-shoot
- Diagnostics at the relay
- Often Bypassed

**Semi-integrated Safety**
- Modular
- Easier to Apply
- More flexible
- Easier to trouble-shoot
- Diagnostics at the relay and at local diagnostic screens
- User friendly

**Integrated Safety**
- Modular & Networkable
- Easiest to Apply
- Most Flexible
- Easiest to trouble-shoot
- Maximum diagnostics
- Task Oriented
- User friendly

Today machine safety is easier to apply, easier to troubleshoot and provides more efficient machine control.
The Aberdene study is proof that safety and productivity are complimentary attributes.

Investment in establishing a positive safety culture and using contemporary methods and technologies will have a significant contribution to profit.
Companies are being asked to do more with less!

Manufacturers today must leverage their automation investment to create an environment for continuous optimization, and improvement to drive sustainability & profitability.

Reduce TCO (Total Cost of Ownership)
- Increased productivity
- Increased asset intensity
- Reduced Injuries
- Reduced risk

Provide Flexible Operations
- Design Processes for Flexibility, Agility, Modularity and Repeatability

Provide Sustainable Operations
- Reduced labor costs
- Improved diagnostic feedback
- Change management status
- Systematic health checks
- Continuous analytics

Provide Traceability
- Provide Robust Information to Operators, Quality, Maintenance & Managers
The days of discrete and isolated manufacturing are gone.

The global trend is for smarter machines that are faster, safer, more flexible and more productive. Global competition and fiscal responsibility are driving companies to improve performance and value.
This has changed the way companies look at manufacturing and machinery!

- Companies are connecting their entire enterprise and are looking for ways to improve performance.
- One way of doing this is by leveraging their safety & automation investment to maximize OEE.

Optimization, speed, innovation, flexibility and cost are the key underlying factors to success in this competitive global market!
Past: Separate Controls & Safety Hardware

Physically Independent
Today: Integrated Controls & Safety Hardware

Physically Combined
Future: Integrated Controls & Safety Architectures
Machine Safety Technology is evolving.

- **1970**: Preventing Access
- **1980**: Detecting Access
- **1990**: Controlling Access
- **2000**
- **2010**
- **2015**

- **Guards**
- **Safeguards**
- **Integrated Safety**

Technology is more flexible, easier to apply, and smarter.

- A machine control strategy that includes harmonized safety and production control systems.
- Harmonizing your safety and production control systems offer tremendous opportunities to improve productivity
  - Shared diagnostics on common HMI for faster troubleshooting
  - A flexible manufacturing system that changes parameters based on conditions
  - Zone control to enable continued production flow when one zone is shut down
  - Better shut down and restart of production systems after a safety event
  - A common control solution that allow provides an environment of continuous improvement thru connectivity and traceability.

Improving performance thru the use of advanced technologies.
Companies are moving toward integrated & contemporary control of entire facilities with complete traceability in order to drive optimization.

Companies are connecting their entire enterprise from the shop floor to the production control systems!
Companies are doing this by using smarter solutions that are more flexible & easier to troubleshoot!

Benefits

- Information enabled.
- Fewer components.
- Less training.
- Streamlined maintenance.
- Optimal connectivity with multiple networks.

Data & diagnostics can be displayed on one HMI.

Safety relays & contactors may not be required.

ControlLogix chassis

Kinetix 6000

DeviceNet

EtherNet/IP

POINT I/O

Safety System

PowerFlex 755

Safety System

Safety Relay

Armor Block I/O

Safet y Relay

PV+ EOI

Pt 8 EOI
Integrated Solutions Enhance Performance by and simplifying the control solution.

Complete machine control with a single platform.
Integrated Safety Strategy

- **Safety Everywhere**
  - All IA Controller Platforms Support Integrated Safety
  - All I/O Platforms Support Safety
  - CIP Safety integration into more end devices than traditional control & I/O

- **Scaled Safety**
  - Safety Primary Controllers support SIL2 and PLd
  - Safety Partner for SIL3 and PLe
  - I/O PLd/PLe configurable via single channel or dual channel wiring
GuardLogix Safety Ratings and Certifications

- Dual Processor Solution (1oo2 Architecture)
  - GuardLogix
  - Compact GuardLogix
- Certified by TÜV Rheinland, Cologne
  - IEC 61508 SIL3
  - ISO 13849-1 PLe (Category 4)
GuardLogix 1002 Logic Element

- ControlLogix Integrated Safety
- Independent Logic Solvers
  - 1002
- Hardware Memory Protection Unit (MPU) restricts access to safety related logic and data (tags)
- Safety related application logic and code executes out of different memory and in different locations
Customer Benefit of Safety Certified Application Instructions

- This TÜV Certified E Stop

  Provides the same functionality as:
  - 16 rungs of logic
    - 2 Timers
    - 5 Latching coils
    - 3 One shots
    - Significant glue logic

  Results
  - Significant reduction in memory usage
  - Much easier maintenance
GuardLogix and CIP Safety Illustration

- EtherNet/IP
  - OK to Run
- DeviceNet
  - LC Clear

CIP Safety on EtherNet/IP
- Standard EtherNet/IP
- CIP Safety on DeviceNet
- Standard DeviceNet
- Discrete Hardwiring

POWER
CIP Safety to Servo (or VFD)

- CIP Safety on EtherNet/IP
- Standard EtherNet/IP
- CIP Safety on DeviceNet
- Standard DeviceNet
- Discrete Hardwiring
Guard I/O

- Guard I/O is the safety rated I/O for GuardLogix
- Three versions:
  - Point Guard I/O (IP20)
  - CompactBlock Guard I/O (IP20)
  - ArmorBlock Guard I/O (IP67)
- Common benefits of all Guard I/O
  - Reduce engineering requirements
  - Use existing network infrastructures
  - Flexibility
  - SIL3 / PLe rated and TÜV certified
Discrete solutions typically require 2 or 3 different software packages and 20-30% more engineering and design time than integrated safety solution!
Integrated Motion, Process and Safety

- All control aspects of a machine / plant in a single Integrated Architecture
  - Same engineering
  - Same diagnosis
  - Same networks (Standard and Safety)
  - Reducing interfaces for communication
  - Simplified programming
  - Synchronization made easy
Safety PLC System Benefits

- Benefits of Programmable Safety Solutions
  - Flexibility
  - Productivity
  - Reduce Wiring Costs
  - Zone Control
  - Diagnostics
  - Integration
  - Reliability
  - Expandability
  - Security
  - Certification
Safety Technology is seen as a key to success in manufacturing.

- Safety has become an integral part of the automation solutions.
- Integrated & contemporary safety solution enhance performance 3 to 5%.
- Safety is now a key measure of manufacturing success.
Thank You!

PUBLIC

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