Think Siemens

Safety Integrated®
For Fail-safe Automation
Agenda – “Lets talk Safety”

Standards - Machine Safety & what has changed

Ascertaining your safety level of risk

Functional wiring examples

Evolution of safety

Technology today

You and the benefits of Integrated Safety

Safety Integrated case studies

Need Help? Safety Training Classes etc.
Changes in the Safety Landscape

Changing Safety Standards

That was then... NFPA 1997

■ “Where a Category 0 stop is used for the emergency stop function, it shall have only hardwired electromechanical components. In addition, its operation shall not depend on electronic logic (hardware or software) ...”

NOW Since... NFPA 79 2002 edition

■ New wording allows PLC Use in Safety-Related Functions:
  “Software and firmware-based controllers to be used in safety-related functions shall be listed for such use.”

Per NFPA 79.....Listed must meet

A.11.3.4 IEC 61508 provides requirements for the design of software and firmware based controllers for use in control systems performing safety-related functions.

A.9.4.3 IEC 61508 provides requirements for the design of control systems incorporating the use of software and firmware based controllers to performing safety-related functions.
American National Standards Institute

National Consensus Standards
B11 Series

http://www.ansi.org

SIMATIC Safety Integrated

Standards
Risk Levels
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Evolution of Safety
Technology Today
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Case Study
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General perspectives
Ergonomic Guidelines for the design, installation and use of machine tools
Mist control considerations for the design, installation and use of machine tools using metalworking fluids
Risk assessment and risk reduction – A guide to estimate, evaluate and reduce risks associated with machine tools
Application of programmable electronic systems for the safety related functions of machines covered by the B11 safety standard series
ANSI Z244.1 (2003)
Control of hazardous energy - Lockout/Tagout and alternative methods
Safety Color Code
ANSI Z535.3 (2002)
Criteria for Safety Symbols
Product Safety Signs and Labels
ANSI Z535.5 (2002)
Accident Prevention Tags and Labels

Additional reference standards with special definitions and additional information:
OSHA 29CFR 1910.147
Control of hazardous energy ("Lockout/Tagout")
IEC 61496 (2003)
Safety of machinery; Electrosensitive protective equipment

Standards for the particular machine type
ANSI B11.1 (2001)
Safety requirements for Mechanical Power Presses
ANSI B11.2 (1995)
Safety requirements for Hydraulic Power Presses
ANSI B11.3 (2002)
Safety requirements for Power Press Brakes
Safety requirements for Shears
ANSI B11.5 (2002)
Iron Workers - Safety requirements for construction, care and use
ANSI B11.6 (2001)
Safety Requirements for Manual Tuning Machines
ANSI B11.7 (2000)
Cold Headers and Cold Formers - Safety requirements for construction, care and use
ANSI B11.8 (2001)
Safety requirements for Manual milling and boring Machines
ANSI B11.9 (1997)
Grinding machines - Safety Requirements for Construction Care and Use
Metal Sawing Machines - Safety Requirements for Construction Care and Use
ANSI B11.11 (2001)
Safety Requirements for Gear & Spline Cutting Machines
ANSI B11.12 (1996)
Roll Forming and Roll Bending machines - Safety Requirements for Construction Care and Use

Automatic Screw/Bar and Chucking machines - Safety Requirements for Construction Care and Use
Cooling Machines - Safety Requirements for Construction Care and Use
ANSI B11.15 (2001)
Safety Requirements for Pipe, Tube and Shape Bending Machines
ANSI B11.17 (1996)
Horizontal Hydraulic Extrusion Presses - Safety Requirements for Construction Care and Use
ANSI B11.18 (1997)
Coil Processing Systems - Safety Requirements for Construction Care and Use
Performance Criteria for Safeguarding
ANSI B11.20 (1996)
Manufacturing systems / Cells - Safety Requirements for Construction Care and Use
ANSI B11.21 (1997)
MachineTools Using Lasers - Safety Requirements for Construction Care and Use
ANSI B11.22 (2002)
Safety Requirements for Numerical Controlled Turning Machines
ANSI B11.23 (2002)
Safety Requirements for Machine Centers
Safety Requirements for Transfer Machines

ANSI B11 TR-6 (in development)
Control reliability circuit requirements and examples
Three distinct approaches to risk reduction:
- Risk reduction by design
- Risk reduction by safeguarding protective devices
- Risk reduction by administrative controls and other protective measures

Equally important is the identification of the tasks and hazards of the machinery in each operating mode.

Documentation of decisions made is critical for the process.

The ANSI risk assessment model is straightforward.... Design out the risk or safeguard it.
# ANSI B11 TR3

Example form from TR3

<table>
<thead>
<tr>
<th>ANSI B11.TR3 Risk Assessment Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Name:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>Machine Description:</td>
</tr>
<tr>
<td>Limits of Assessment:</td>
</tr>
<tr>
<td>Participant Name(s):</td>
</tr>
<tr>
<td>Information Sources:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User</th>
<th>Task</th>
<th>Hazard</th>
<th>Comment(s)</th>
<th>Before Risk Reduction</th>
<th>After Risk Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Severity</td>
<td>Probability</td>
</tr>
</tbody>
</table>

This form is an example. Other forms are acceptable.
### Categories acc. to EN 954-1

For safety-relevant parts and components of control systems, potential risks are evaluated and classified in Categories B and 1 to 4 acc. to EN 954-1. This classification should not be considered a hierarchical classification.

A simplified representation can be considered as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Brief summary of the requirements</th>
<th>System behavior</th>
<th>Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Requirements of B must be fulfilled; a single fault must be detected before or at the next demand upon the safety function.</td>
<td>When faults occur, the safety function is always performed; the faults are detected in time to prevent the loss of the safety function.</td>
<td>Mainly characterized by the structure of the control</td>
</tr>
<tr>
<td>3</td>
<td>Requirements of B must be fulfilled, a single fault may not lead to the loss of the safety function; single faults must be detected</td>
<td>The safety function is always performed when single faults occur</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Requirements of B must be fulfilled; the safety function shall be checked, additionally at suitable time intervals.</td>
<td>The occurrence of a fault can lead to the loss of the safety function between the checks.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Requirements of B must be fulfilled; well-proven components and safety principles shall be used.</td>
<td>The same system behavior as B, however with a higher safety-relevant reliability</td>
<td>Mainly characterized by the selection of components</td>
</tr>
<tr>
<td>B</td>
<td>The control must be designed so that it can withstand the expected influences</td>
<td>The occurrence of one fault can lead to the loss of the safety function</td>
<td></td>
</tr>
</tbody>
</table>
What’s happening with the IEC

Machines with Complex Controls PLC

Machines with less complex controls (Hydraulic, Pneumatic, and Relays)
Examples: Categories acc. to EN954-1

Requirements of B must be fulfilled: the safety function shall be checked, additionally at suitable time intervals.

Cat 2

ASisafe

or

F-CPU

3TK28

* Positively-driven

K1

M

Closed

Open

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SIMATIC Safety Integrated for Factory Automation
Examples: Categories acc. to EN954-1

Requirements of B must be fulfilled: a single fault may not lead to the loss of the safety function; single faults must be detected.

Cat 3

ASisafe

or

F-CPU

3TK28

E-STOP

Positively driven

Protectiv door monitoring with position-switches

Protectiv door monitoring with magnetic-switch

24V

24V

* Positively-driven
Requirements of B must be fulfilled: a single fault must be detected before or at the next demand upon the safety function.

Cat 4

Examples: Categories acc. to EN954-1

VS1 VS2

VS1 VS2

VS1 VS2

3TK28

F-CPU

ASisafe

Positively driven

SIMATIC Safety Integrated for Factory Automation
The Evolution of Safety

Prior to 2002, U.S.A. required separation
The Evolution of Safety

PLC Control Technology

Control Cabinet Safety Relays

PROFIBUS

SIMATIC Safety Integrated for Factory Automation
Safety integrated – PROFIsafe and SAW

SIMATIC Safety Integrated

- Standards
- Risk Levels
- Functional Examples
- Evolution of Safety

Technology Today
- Benefits
- Case Study
- Training

PLC control technology + safety

PROFIBUS + safety

Safety monitor
Safety Integrated
The integrated program for safety technology

Detection and evaluation

Price

ET200 S F-CPU
S7 300-F
S7 400-F

3TK2840
Electronic

3TK28 Relay

3TK285 Multi-function

3TK28 Relay & Contactor Relays

3RA7 Safe load feeders

ASIsafe Safety Monitor

A complete product range for an optimal safety concept

Functionality

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Four main options:

- Hardwire with safety relays
- ASIsafe (Safety at Work)
- Safety rated PLC (Siemens S7 300/400F)
- Safety rated PLC with distributed I/O
Functionality of a Safety Circuit – Safety Relay

24V or 115VAC Power Supply

Redundancy: ensures safety functionality even if a failure disables one channel

Sensors: Initiate machine shut down

Direct opening action: Guarantees that all NC contacts are in the open position when actuated

Safety relay unit: Fault detection and evaluation; opens the circuit in case of a failure.

Feedback Loop: monitors the correct operation of the contactor coils

Reset: reactivates the safety circuit

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The Safe Approach – Cost Effective Solutions

Four main options:

- Hardwire with safety relays
- ASIsafe (Safety at Work)
- Safety rated PLC (Siemens S7 300/400F)
- Safety rated PLC with distributed I/O
**AS-Interface® ASISafe™**

AS-Interface is an “OPEN” industrial communication network for data exchange between Electro-Mechanical input/output devices and automation controllers (PLC’s).

Over 10 million nodes have been installed in plants and systems since 1994.
Major Components – AS-I Safety at Work

- Safety Monitor
- Safety I/O Blocks
- Configuring Software
Safety mechanisms - Safety Monitor

Code tables of Failsafe Slaves

Code Checker:
Code is right = RUN

Safety Monitor

Failsafe Slave

Cycles : 8

0111
Safety mechanisms - Code Checker

Failsafe detection by one defined code

Code tables of Failsafe Slaves

Emergency Stop pushed: Code not right = STOP!

Safety Monitor

Failsafe Slave
Easy Grouping of Safety Signals with AS-Interface Safety at Work

- Standard-PLC and standard-master
- AS-i power unit
- Safety monitor
- Standard module
- Safe emergency stop button
- Safe module

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ASIMon Software
Easy Configuration via Drag & Drop

Available Devices
(placeholder by drag and drop to the corresponding column)

Devices with direct access to the safe outputs

Devices with logic Functions are preprocessed
The Safe Approach – Cost Effective Solutions

Four main options:

- Hardwire with safety relays
- ASIsafe (Safety at Work)
- Safety rated PLC (Siemens S7 300/400F)
- Safety rated PLC with distributed I/O
Siemens Safety PLC Experience

SIMATIC Safety Integrated for Factory Automation

- **1980**: S5-110F
- **1988**: S5-115F
- **1994**: S5-95F
- **1999**: S7-400F / PROFIsafe
- **2002**: S7-315F / 151F / 416 F / PROFIsafe
- **2003**: S7-317 F / PROFIsafe
Achieving Safety Integrated

- Intelligent I/O
- Highly reliable Network
- Safety rated CPU

Completely integrate Safety into your Automation Control Architecture
...being really sure requires 3 levels

Safety I/O Layer

Safety Network Layer

Safety CPU Layer
Failsafe I/O modules protect locally & simplify the design and wiring,
Even if the PLC and Network Fail, the I/O Module can go into Safety Lockout.
Certified Safety Output

Output module includes input functions to test Control components.

Failsafe I/O modules protect locally & simplify the design and wiring,
Even if the PLC and Network Fail, the I/O Module can go into Safety Lockout.
The Network Level

All data and states at each level...
...must be checked and rechecked
Safety Communication via PROFIsafe

- **PROFIsafe**, the application profile is independent of the media
  - Technology can be used both on PROFIBUS and Ethernet

- **PROFIsafe** detects communications faults
  - Serial numeration of PROFIsafe-telegram
  - Time monitoring
  - Authenticity monitoring via unique addresses
  - Optimized CRC-checking

Safety data is part of the standard network protocol
Siemens achieves diversity on a single processor!

**Time redundancy and diversity instead of physical redundancy**

Controller

**Failsafe CPU Program**

- **Time testing and diversity create tested Logic**
  - Standard-Operation for DATA represents the program written in ladder logic
  - Diverse Operation for COMP created by compiler requiring no programming
  - CPU-internal comparison at outputdriver allows I/O to stop safety

Example: AND Instruction

- Bit-AND in Bitprocessor
- Word-OR in ALU
- Comparison
- Copy
- Convert
- Build PROFISafe telegram
- Data CRC
- Comparison

0 FFFF_H

1 0_H

**Standards**
**Risk Levels**
**Functional Examples**
**Evolution of Safety**

**Technology Today**
- Benefits
- Case Study
- Training
Implement the latest technology in your SAFETY applications

Highlights DP/AS-i F-Link

- Full TIA-Integration of ASI safe in Safety Integrated: consistent, throughout the whole plant and easy to handle!
- Uplink of ASI safe onto upper levels - i.e. PROFIBUS and PROFINET

- First show of the F-Link @ SPS/IPC/Drives 2006
- In the first release only F-DI’s (no safe output)

Order-No.
3RK3141-1CD10 screw terminals
3RK3141-2CD10 spring-loaded terminals
Safety Integrated Network Topology (1): Connection of AS-i to PROFIBUS

- Standards
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- Functional Examples
- Evolution of Safety
- Technology Today
- Benefits
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- Training

SIMATIC Safety Integrated for Factory Automation
Safety Integrated Network Topology (2): Connection of AS-i to PROFINET
Safety Integrated Network Topology (3): Connection of AS-i to PROFINET
SIMATIC Safety Integrated controllers
For factory automation

- Standards
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SIEMENS

SIMATIC Safety Integrated for Factory Automation
### SIMATIC Safety Integrated Controller for Factory Automation

<table>
<thead>
<tr>
<th>component</th>
<th>IM151-7 F-CPU</th>
<th>CPU 315F-2DP CPU 315F-2PN/DP</th>
<th>CPU 317F-2DP CPU 317F-2PN/DP</th>
<th>CPU 416F-2 CPU 416F-3PN/DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-memory</td>
<td>128 kBit</td>
<td>256 kB (2DP) 256 kB (2PN/DP)</td>
<td>1 MB</td>
<td>5.6 MB</td>
</tr>
<tr>
<td>Load-Memory</td>
<td>64 kB – 8 MB</td>
<td>64 kB – 8 MB</td>
<td>64 kB – 8 MB</td>
<td>256 kB – 64 MB</td>
</tr>
<tr>
<td>Processimage PII/PIO</td>
<td>128 Byte</td>
<td>384 Byte</td>
<td>1024 Byte (2DP) 2048 Byte (2PN/DP)</td>
<td>16 kB</td>
</tr>
<tr>
<td>FB/FC/DB</td>
<td>512/512/511</td>
<td>2048/2048/1023</td>
<td>2048/2048/2047</td>
<td>2048/2048/4095</td>
</tr>
<tr>
<td>Bits memories</td>
<td>2048 Bit</td>
<td>16 kBit</td>
<td>64 kBit</td>
<td>128 kBit</td>
</tr>
</tbody>
</table>
Typical

SIMATIC Safety Integrated

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Safety Relay
Standard PLC

Safety Listed PLC (includes standard PLC)

Safety Motor Starters

SIMATIC Safety Integrated for Factory Automation
Real World Example: Motor Starter Panel

Traditional

NEW!
Typical Safety PLC Architecture

- Safety PLC Controller
  - ET 200 S, F CPU
- Safety rated PLC
- ET 200SF CPU on PROFIBUS
- Cabinet less Safety I/O
- PROFISafe Laser scanner
- Standards
- Risk Levels
- Functional Examples
- Evolution of Safety
- Technology Today
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- Training
After – with Safety Integrated

SIMATIC Safety Integrated

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SIMATIC Safety Integrated
Customer benefits

Cost effective compliance

Reduced inventory thanks to savings on components
- One CPU for standard and safety-related automation
  - Coexistence of standard and safety-related program possible on one CPU
- One PROFIBUS/NET cable for standard and safety-related communication

Faster system setup and commissioning
- Improved system integration
  - Integrated engineering for standard and failsafe control section
  - Use of existing PROFIBUS cable for failsafe communication too
  - Extensive diagnostics functions
### Customer benefits

#### Increased flexibility
- The logic of the safety functions is implemented per software instead of by wiring
  - Easy to modify, expand, and document

#### Cost and Time savings for Plant Automation
- In contrast to hardware solutions, software solutions are easy to reproduce

#### Improved Plant efficiency
- Earlier detection of faults through improved diagnostics functions
- Improved uptime via reduced time for trouble shooting

#### More Reliable and more effective in preventing accidents
Case Erector Packaging Machine

Discretely Wired Machine

- PLC
  4 Electricians more than 1 week to wire 4 x 76 hours = 304 hours

- Startup 2 day for 2 electricians 2 x 2 x 8 = 32 hours

- Category 3 safety system 4 x 8 = 32 hours

Total 368 hours
**Pearson Case Study (source Pearson Packaging)**

**Case Erector Packaging Machine**

Machine built with distributed I/O and distributed safety I/O

- **PLC**
  - 2 Electricians 1 week to wire
  - No junction boxes
  - No conduit
  - No wire markers
  - No wire terminals
  - Startup less then 1/2 day for 2 Electricians
  
  \[2 \times 40 = 80 \text{ hours}\]

- **Category 3 safety system**
  - Eliminate Conduit
  - Significant Labor Reduction
  - Installation Hardware
  - Panel Space
  
  \[2 \times 4 = 8 \text{ hours}\]

**Total** \[96 \text{ hours}\]
CAMotion Case Study

CAMotion User Profinet Over Wireless To Transmit Both Safety-Related and Normal Control Data Between The Overhead Gantry And The Main Control Cabinet.

The Availability Of Products To Transmit Profinet Wirelessly Fulfilled CAMotion’s Desire To Reduce Cabling Cost, Shorten Installation Time And Simplify Start-Up.

CAMotion User Profinet Over Wireless To Transmit Both Safety-Related and Normal Control Data Between The Overhead Gantry And The Main Control Cabinet.

The Availability Of Products To Transmit Profinet Wirelessly Fulfilled CAMotion’s Desire To Reduce Cabling Cost, Shorten Installation Time And Simplify Start-Up.
KUKA Reduces Cost & Improves Safety

Rod Brown, Controls Process Engineer at Kuka Flexible Production Systems states savings of:

- 85% of conventional safety components
- 30 to 35% in labor costs
- 20 to 25% in reduced installation time
- additional reductions in panel size, floor space, and engineering effort

Anticipated operating efficiencies include:

- reduced down time due to improved diagnostics
- improved productivity due to increased up time

"We built the system in no time and commissioning was surprisingly easy. This approach has saved us $10's of thousands on the first installation alone." Says Rod Brown, KUKA Engineer.
Best Practice: example of a Major Semiconductor OEM

Benefits:

- The Siemens Hardware cost $4,100 more than the “old” Safety System
- Reduced the overall costs by $13,800 / Tool with Siemens Safety
- Reduction of initial engineering costs.
- **Reduction of testing costs** (each system that goes out the door).
- **Off the shelf products, available in 190 countries**
- Improved Diagnostics providing enhanced availability and easier trouble shooting (quicker startup and lower serviceability costs).

300 Tools/year x $9,700 = $2.91 Million/year cost reduction
Siemens Training Classes “SITRAIN”

Pay-Per-View Interactive Video Training

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Price</th>
<th>Description</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Safety: NFPA 70E Arc Flash Training</td>
<td>$39.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Safety: Qualified Workers</td>
<td>$39.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Safety: Non Qualified Workers</td>
<td>$39.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lockout Tagout: Take Control</td>
<td>$39.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above links take you to the course descriptions.

Safety Workshops

- NFPA 70E Arc Flash Workshop
- Risk Assessment Workshop
- Safety Awareness OSHA 10-hour workshop

www2.sea.siemens.com/training

Classroom Training Overviews

- Arc Flash Training
- Safety Product Training
- Risk Assessment Training
- Safety Awareness Training
- Schedule
# Upcoming Events

<table>
<thead>
<tr>
<th>Date &amp; Time</th>
<th>Event</th>
<th>Panelists Info</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 17, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>The Plug &amp; Play Technology for Machine Safety</td>
<td>John D'Silva Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
<tr>
<td>April 24, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>Understanding Drive Safety for Robotic and Press Applications</td>
<td>J.B. Titus, CSP Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
<tr>
<td>April 29, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>Implementing Machine Safety Circuits for U.S. Standards Compliance</td>
<td>Brian Libby Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
<tr>
<td>May 1, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>The Plug &amp; Play Technology for Machine Safety</td>
<td>John D'Silva Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
<tr>
<td>May 13, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>Implementing Machine Safety Circuits for U.S. Standards Compliance</td>
<td>Brian Libby Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
<tr>
<td>May 15, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>How to Improve Safety in the Material Handling Industry</td>
<td>Brian Libby Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
<tr>
<td>May 16, 2008 2:00 pm - 3:00 pm Eastern DT</td>
<td>The Plug &amp; Play Technology for Machine Safety</td>
<td>John D'Silva Siemens Energy and Automation</td>
<td>Open Enrollment</td>
</tr>
</tbody>
</table>

## Event Recordings

<table>
<thead>
<tr>
<th>Topic</th>
<th>Panelist</th>
<th>Date</th>
<th>Duration</th>
<th>Size</th>
<th>View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will you be ready when OSHA comes knocking?</td>
<td>Bruce Main</td>
<td>June 21, 2007</td>
<td>60 mins</td>
<td>78.2 MB</td>
<td><a href="#">View</a></td>
</tr>
<tr>
<td>The Plug &amp; Play Technology for Machine Safety</td>
<td>John D'Silva</td>
<td>August 23, 2007</td>
<td>60 mins</td>
<td>174.9 MB</td>
<td><a href="#">View</a></td>
</tr>
<tr>
<td>Safety Integrated: Is your bottom line at risk?</td>
<td>Tim Parmer</td>
<td>July 19, 2007</td>
<td>60 mins</td>
<td>105.4 MB</td>
<td><a href="#">View</a></td>
</tr>
<tr>
<td>Expanding the safety zone with Wireless Ethernet</td>
<td>Tim Parmer, Harold Muma and Stefan Sattler</td>
<td>September 20, 2007</td>
<td>60 mins</td>
<td>100.0 MB</td>
<td><a href="#">View</a></td>
</tr>
<tr>
<td>Discover Safety-Fieldbus and how it will Impact the Process Industries</td>
<td>Charles M. Fialkowski, C.F.S.E.</td>
<td>October 18, 2007</td>
<td>60 mins</td>
<td>85.1 MB</td>
<td><a href="#">View</a></td>
</tr>
</tbody>
</table>
Need More Information or Hands On

Welcome to the Siemens Energy & Automation Event Website

What we offer: Education and Hands-On Opportunities

As a leader in the industrial market place, Siemens Energy & Automation, Inc. offers a wide range of opportunities to learn about the latest trends and technologies available today. These events are presented across the country in a variety of environments from presentations exploring a particular technology to actual hands-on implementation as part of an industrial solution.

Event types

Seminars
These events are in an environment where a specialist will present and explain the latest trends and technologies available as part of an application solution in an industrial plant.

→ More on Seminars

Lunch and Learns
These events are in an environment where actual hands-on training will be provided.

→ More on Lunch and Learns

Workshops
These events combine the best of both Seminars and Lunch 'n' Learns.

→ More on Workshops

Training On
Siemens also provides a special program called "Training On" that offers you a unique venue to experience select workshops which use state-of-the-art technology in a hands-on learning environment.

www.AutomationEvents.com
Key Items

Changes to the NFPA 79 2002
Risk Assessment now Required by OSHA

Today’s Technology – Four Safety Options
1. New electronic Safety Relays
2. ASI Safety at Work
3. Safety PLC S7300/400
4. Safety with Distributed I/O

Benefits of Distributed Safety
One PLC for both Automation and Safety
One software programming environment
Standard and Safety I/O in the same rack
Save on installation, engineering, spare parts, and startup costs

Safety Seminars, Training and Workshops
SIMATIC Safety Integrated
For all industrial environments

Redundant Controllers
- CPU 414H
- CPU 417H

Single Controllers
- CPU 414
- CPU 417

Controller Engineering
- CFC

Safety Matrix

PROFIBUS with PROFIsafe-Profil
ET 200M ET 200eco ET 200S ET 200pro

PROFINET with PROFIsafe-Profil
ET 200S ET 200pro

Number one Safety PLC in North America and the

1) for Factory Automation
SIMATIC Safety Integrated for Factory Automation

04-10-07
Siemens AG 2005 - Subject to change without prior notice
Thank You!