Automation Infrastructure For Operational Excellence.

In This Issue:
- 2011 General Assembly
- Latest EDDL Enhancements
- Global Fieldbus Events
- H1 Physical Layer Testing
- New Segment Design Tool
- Wireless I/O Lab Tests
- Eastman Chemical Project
Flexible fieldbus modularity

Reduce costs and prevent downtime

Increase the availability of your process with our single-channel fieldbus barrier and redundant power supply. The modular fieldbus system offers tailored installation, fast module replacement and flexible expansion.

Field junction box
- Increase system availability with single-loop integrity
- Easy and fast installation of prewired junction box

Redundant power supply
- Modular structure for increased system availability
- Integrated diagnostic function with relay output
- Maximum service life thanks to Auto Current Balance Technology (ACB)

For additional information call 800-322-3225 or visit phoenixcontact.net/processfieldbus
President’s Letter

FOUNDATION Fieldbus: Unmistakable Signs of Continued Growth

As of this writing, there are unmistakable signs that FOUNDATION fieldbus continues to emerge as the “technology-of-choice” for the process automation industry — particularly in growing markets such as Asia-Pacific, Latin America and the Middle East. Our 2011 General Assembly, held March 9-10, 2011, in Mumbai, India, attracted nearly 500 attendees from throughout India. This was the largest General Assembly in our organization’s history.

It’s no surprise the foundation held its annual gathering in Mumbai. Like China, Brazil and other developing countries, India is expanding its manufacturing infrastructure at an impressive rate. This bodes well for suppliers of FOUNDATION fieldbus products. A majority of Greenfield plants, and a growing number of Brownfield operations, are employing our technology to achieve significant lifecycle cost benefits and a path to superior asset management.

As 2011 unfolds, it’s worth taking a moment to reflect upon the Fieldbus Foundation’s achievements during the previous year. We are advancing the utilization of an open, interoperable fieldbus automation infrastructure incorporating both High Speed Ethernet (HSE) and industrial wireless applications. In addition to the HSE Remote I/O (HSE-RIO) development, the Fieldbus Foundation/ISA Cooperation (FIC) team is preparing specifications for the wireless HSE backhaul to HSE-RIO gateways. The Wireless Sensor Interface Team is developing specifications for interface of wireless sensor networks to these gateways.

Our HSE-RIO preliminary specification was recently released for review by members, and wired HART® and WirelessHART™ integration specifications are currently being validated. And, we have successfully tested the first WIO gateway interconnecting WirelessHART devices to a wireless backhaul network.

Momentum is also building for FOUNDATION Fieldbus for Safety Instrumented Functions (FF-SIF) technology, with leading process industry companies such as Shell Project & Technology and Saudi Aramco in the process of building FF-SIF pilot projects. These efforts will only increase the demand for automation suppliers to deliver FF-SIF products to the market.

Additionally, the Fieldbus Foundation is expanding its host testing capabilities to ensure more robust device-to-host integration. We are launching an independent physical layer testing service intended to reduce device development costs by eliminating the need for suppliers to purchase dedicated tools or services for physical layer testing, and to enable consistent testing through a predefined set of test cases.

It should also be noted that the foundation experienced an 11.3% growth in membership during 2010. I would like to personally welcome all of our new members!

Going forward, the Fieldbus Foundation will maintain its high profile in the global automation industry. Late last year, we announced that Dr. Gunther Kegel, President and CEO, Pepperl+Fuchs GmbH, had replaced John Berra, formerly chairman of Emerson Process Management, as foundation chairman. Dr. Kegel has a lengthy résumé in the process automation industry and will provide ambitious direction for the Fieldbus Foundation in the years to come.

John Berra retired after serving 16 years in his foundation leadership post. He helped to guide our organization in reaching many significant milestones and was tireless in his efforts to promote FOUNDATION technology within his own company and throughout the marketplace. The entire fieldbus community owes John a significant debt of gratitude.

Most recently, Larry O’Brien was appointed as our Global Marketing Manager. Formerly of ARC Advisory Group, Larry has over 18 years of experience in the process automation business as a research director and industry analyst, and has been closely tracking and reporting on developments surrounding FOUNDATION fieldbus for much of his career. He will be responsible for developing the strategic marketing direction for FOUNDATION fieldbus worldwide. Larry’s qualifications will be very helpful in expanding the presence of our technology throughout the world.

All in all, despite the continued economic challenges, the Fieldbus Foundation and its members enjoy a promising future.

Best Regards,

Richard J. Timoney
President & CEO
Fieldbus Foundation
MTL's new range of Fieldbus Barrier wiring hubs establish a new benchmark for FOUNDATION™ fieldbus networks.

The 9370-FB Series Fieldbus Barrier retains the major benefits of the "High Energy Trunk" technique whilst removing the drawbacks associated with existing implementations. Gone are inflexible, custom-built field enclosures and complex wiring looms. The result is lower cost, safer operation and higher reliability throughout the life-cycle of the fieldbus network, with benefits not only for the plant operator but for all parties involved in the design and installation process.

- Live pluggable modules for safer maintenance
- Optional surge protection - even as a retro-fit
- Standard enclosures eliminate "customised" wiring
- Smaller footprint gives up to 70% space saving

To find out how MTL can help you with your next Fieldbus project, visit our website at: www.mtl-fieldbus.com or email: enquiry@mtl-inst.com

9370-FB... Fieldbus Barriers... only better

---

Turn this into a state-of-the-art, 10-plant petrochemical complex. In 27 months. With 10 EPCs. And 1 automation architecture. You're kidding, right?

In fact, the automation was so tightly integrated that when the time came for SECCO to flip the switch, all 10 plants came on-stream simultaneously. Without a hitch. Regardless of how ambitious your project may feel, you can trust Emerson to get it done. Read more about this extraordinary case at EmersonProcess.com/SECCO

EMERSON. CONSIDER IT SOLVED.
Fieldbus Foundation Holds 2011 General Assembly in India
Largest gathering in foundation’s history attracts nearly 500 attendees

EDDL Enhancements Incorporated in IEC 61804-3 Standard
Electronic Device Description Language benefits entire automation industry

Global Events Program Expanding to Serve Fieldbus Community
Seminars, roadshows, exhibitions and training will focus on Foundation Fieldbus

Advancements in Physical Layer Testing Assist Device Developers
Consistent testing of H1 fieldbus devices ensured via predefined test cases

New DesignMATE™ Tool Simplifies Fieldbus Implementation
Software audits segment layouts for conformance with industry standards

Wireless I/O Makes Progress with Successful Lab Tests
WIO provides open fieldbus infrastructure incorporating both HSE and wireless

Improved Fieldbus Operations with Advanced Diagnostics
Eastman Chemical installs fieldbus system designed for hazardous environment

Avoid the number one pitfall of FOUNDATION™ fieldbus networks: All power and communications are vulnerable to a single broken twisted wire pair.

Designed for plant-critical fieldbus segments, TRUNKSAFE™ maintains all process communications without interruption, even if the network cable is broken or shorted.

With TRUNKSAFE, now you can take full advantage of fieldbus technology without worrying about simple cable failures.

The Fieldbus Foundation offers a selection of comprehensive Application Guides that can help end users get on the “Fast Track to Fieldbus.” These documents provide valuable information regarding fieldbus installation procedures, wiring guidelines, network isolation techniques, and more.

To download the Application Guides, visit: www.fieldbus.org/About/FoundationTech/Resources

Learn more at: www.miinet.com/moorehawke
Fieldbus Foundation Holds 2011 General Assembly in India

Largest gathering in foundation’s history attracts nearly 500 attendees

On March 9-10, 2011, Mumbai, India, was the site of the largest annual gathering in the Fieldbus Foundation’s history. Nearly 500 attendees, including many of the world’s leading suppliers and end users of FOUNDATION fieldbus, took part in the 2011 General Assembly, held at the JW Marriott Hotel Mumbai.
India was selected as the site for the 2011 General Assembly due to its status as the world’s fastest growing market for process automation and the overwhelming demand for FOUNDATION technology within the area. Many of the world’s largest FOUNDATION fieldbus installations are also located in India, and the amount of application expertise being developed in India is considerable.

Based on the theme “Achieving Operational Excellence with FOUNDATION Technology,” the 2011 General Assembly highlighted the advantages of FOUNDATION fieldbus as a world-class solution for improving plant asset management, reliability and economic performance. FOUNDATION technology continues to advance to meet the needs of the process industries, with FOUNDATION fieldbus for Safety Instrumented Functions (FF-SIF), control in the field, field diagnostics and wireless solutions.

The General Assembly program on Wednesday, March 9, included an end user-oriented agenda consisting of fieldbus project case studies given by prominent automation end users from throughout India, as well as various fieldbus tabletop exhibitions. Additional presentations provided updates on the latest FOUNDATION technology developments. The day concluded with a reception for all attendees.

The Fieldbus Foundation conducted its annual business meeting on Thursday, March 10.

The 2011 General Assembly kicked off with welcoming remarks by Mr. Thampy Mathew, Regional Sales Director-PA, Pepperl+Fuchs, and Chairman, Fieldbus Foundation India Committee (FFIC); and Mr. B.R. Mehta, Senior Vice President, Reliance Industries Limited, and Chairman, Fieldbus Foundation India End User Council (FFIEUC).

Fieldbus Foundation President and CEO Rich Timoney addressed the gathering and introduced new Fieldbus Foundation Chairman Dr. Gunther Kegel, CEO, Pepperl+Fuchs. Mr. Timoney described the continued growth of FOUNDATION technology in both established and developing industrial regions of the world. He also highlighted the additions to foundation membership in 2010, with total membership increasing 11.3 percent. Significant membership gains have been noted in China, Korea and other developing areas.

Fieldbus Foundation Director of Technology Development Dave Glanzer provided a summary of recent technology advancements such as enhanced Electronic Device Description Language (EDDL), High Speed Ethernet Remote I/O (HSE-RIO), FOUNDATION fieldbus for Safety Instrumented Functions (FF-SIF), and wireless.

Mr. P. Mahajan, Technical Director, Engineers India Limited (EIL), gave the 2011 General
OTHER GENERAL ASSEMBLY NEWS

Pepperl+Fuchs
The Indian team of Pepperl+Fuchs presented the latest developments in physical layer technology and advanced diagnostics to General Assembly attendees. Thampy Mathew, the company’s Sales Director, Middle East - India, and Chairman of the Indian Fieldbus Foundation Marketing Committee, supported the organization of the event. Further major contributions where made by Dr. Gunther Kegel, CEO of Pepperl+Fuchs and Chairman of the Fieldbus Foundation’s board of directors, and Marc Van Pelt, Secretary and Vice President, EMEA Operations for the foundation, as well as Sales Director, Western Europe, with Pepperl+Fuchs.

R. STAHL
Besides its full range of products for fieldbus installations in Zone 1 and 2 hazardous areas, R. STAHL presented new solutions such as a prototype of Foundation fieldbus HSE Remote I/O and advanced physical layer diagnostics. All R. STAHL fieldbus power supplies feature integrated physical layer diagnostics. Access to diagnostics information is possible either with the integrated PC interface pre-active alarming with LED and relay contact, or the brand new Diagnosis Communication Module with H1 connectivity and enhanced DDC for asset management integration.

MooreHawke
MooreHawke displayed its TRUNKGUARD Device Couplers, which provide Automatic Segment Termination and fully auto-re-setting spur short-circuit protection. Automatic Segment Termination eliminates the most common installation error: segment failure from under- or over-termination. Utilizing a “FoldBack” spur short-circuit protection technique, any spur that attempts to draw more than 48 mA is automatically switched off and not permitted any current flow until the fault is removed.

Smar
Smar had a strong presence at the 2011 General Assembly thanks to its local representative, Laxsons Automation, who confirmed the great interest in the event and in Foundation fieldbus, which has become more and more popular in the Indian market. Laxsons’ conversations with attendees revealed that most end users no longer have questions about the advantages of fieldbus over traditional 4-20 mA. Rather, they are interested in achieving operational excellence and finding new ways to optimize their processes using the technology.

Assembly keynote address. Mr. Mahajan started his career with India’s Department of Atomic Energy (DAE) as a scientific officer. During his tenure in the DAE, he was primarily responsible for the engineering, procurement, construction and maintenance of instrumentation and control systems for heavy water projects. Mr. Mahajan played a significant role in the Indian process industries by introducing the concept of electronic instrumentation and intrinsically safe systems in electrically hazardous plants to India in 1974.

Mr. Mahajan called Foundation fieldbus “one of the best things that has happened in our industry.” Citing the Fieldbus Foundation’s long history of end user involvement in the development and evolution of the technology, he said, “Foundation fieldbus has a definite edge over other fieldbus technologies” and that the onus is on consulting organizations to play a responsible role to suggest the “right usage of the right technology.”

Mr. Mahajan also stated that control in the field (CIF) with Foundation fieldbus should be the default choice for many process automation applications, and described the technology as an “effective tool” for plant asset management.

Another prominent end user, Patrick Flanders, ESD Specialist, Saudi Aramco, KSA, delivered a presentation entitled, “Foundation Fieldbus for Safety Instrumented Functions (FF-SIF).” Mr. Flanders stated, “The use of FF-SIF technology is nothing short of a breakthrough in safety system design. Using this new communications technology, advancements will be possible that safety system designers never imagined with conventional technology. The field installation planned at the Juaymah Gas Plant will provide an opportunity to demonstrate the benefits offered by the introduction of the new FF-SIF communications in the operating environment.”

Other 2011 General Assembly speakers and topics included:


Dave Glanzer, Director – Technology Development, Fieldbus Foundation – “Foundation Technology Update”

Fieldbus Foundation President and CEO Rich Timoney performed the traditional “lighting of the lamp” ceremony to kick off the General Assembly program.
Leading suppliers of Foundation fieldbus equipment were on hand in Mumbai to participate in a tabletop product exhibit.

**Travis Hesketh**, Fieldbus Foundation Steering Committee, EMEA – “Control in Field (CIF)”

**H.S. Gambhir**, Vice President, Reliance Industries Limited – “Implementing Foundation Fieldbus in KGD-6”


**A. Rajabahadur**, Director, ARC India – “CAPEX/OPEX Benefits Using Foundation Fieldbus”

The General Assembly program concluded with a panel discussion among presenters, which was moderated by Mr. B.R. Mehta of Reliance Industries Limited. Mr. Harsih K. Wadhwa, Fieldbus Foundation India Events Committee Chairman, delivered the closing remarks.

Presentations from the 2011 General Assembly are available for download on the Education Page of the Fieldbus Foundation website.
EDDL Enhancements Incorporated in IEC 61804–3 Standard

Electronic Device Description Language benefits entire automation industry

The latest enhancements to Electronic Device Description Language (EDDL), which are key to the performance of FOUNDATION fieldbus and other digital protocols, have been incorporated in the second edition of the International Electrotechnical Commission (IEC) 61804-3 standard. This technology provides a universal, proven and state-of-the-art method for accessing diagnostic, real-time and asset management information contained in millions of industrial field instruments, while also ensuring optimal data and device interoperability.

EDDL is a text-based language for describing the digital communication characteristics of intelligent devices and equipment parameters in an operating system (OS) and human machine interface (HMI) neutral environment. EDDL assists engineers during Distributed Control System (DCS) configuration, technicians during commissioning and maintenance using device configuration software for laptop or handheld field communicators, and operators working at DCS consoles or using intelligent device management software as part of asset management solutions.

The latest enhancements to EDDL include:

- Support for modular devices, such as I/O subsystems that can be populated with new I/O cards over time without having to upgrade system software.
- Support for offline configuration with default parameter values suggested by the device manufacturer to simplify and speed up device commissioning.
- Support for Unicode character sets to display parameter labels, diagnostics and device manufacturer expert help text in many different languages, including Japanese, Chinese, etc.
- Ability to display all device diagnostics from different blocks and all setup information on a single page, making devices easier to use and enabling commissioning and maintenance tasks to be completed faster.
- Ability to display information based on prior selections and internal dependencies in the device, only presenting valid options so as to not clutter the pages or “wizards” (methods) with irrelevant information or waste the technician’s time by prompting for information that will not be used or options that do not apply.
- Ability to display illustrations based on the chosen language. For instance, this could include images with explanatory text conveying know-how from the device manufacturer to assist in the interpretation of advanced diagnostics and guide setup and troubleshooting.

Initially developed in 1992, EDDL technology forms the engineering and operating foundation upon which all major digital automation protocols construct parametric and device descriptions. Because EDDL is an open technology with international standard status, it can be easily and effectively applied to any device and any fieldbus protocol.

The EDDL solution enables host system manufacturers to create a single engineering environment that can support any device, from any supplier, using any communications protocol, without the need for custom software drivers for each device type. Both simple and complex devices can be managed from the same software with full access to advanced functionality to complete tasks such as commissioning, setup, calibration and diagnostics. As devices become more sophisticated, EDDL makes them easier to use.

Fieldbus Foundation President and CEO Rich Timoney is pleased with the EDDL enhancements. “The latest developments increase the value proposition of EDDL for the entire plant automation industry,” said Timoney. “The FOUNDATION fieldbus Version 5.1 specification is based on this standard, which provides interoperability across multiple hosts, devices and technologies. This flexibility allows the end user to choose the best combination of price and performance for devices and software. Competitive bids are easier to evaluate because the end user does not have to worry if specific software packages are available to support various devices.

He added, “With EDDL, all control systems support comparable EDDL devices. Interoperability means operators and maintenance personnel can easily find the calibration and
diagnostic information needed for a particular device, and all EDDL-compatible devices will provide the necessary information in a ‘look and feel’ of the host system.”

By employing EDDL, end users can calibrate instruments, diagnose problems, provide data for user interface displays, identify process alarms and obtain information needed for high-level software, such as Manufacturing Execution Systems (MES), supervisory control and data acquisition (SCADA), plant historians, asset management and Enterprise Resource Planning (ERP). The technology is key to interoperability in a digital process automation architecture, enabling control systems and intelligent field devices from different manufacturers to work together.

EDDL has a long track record of ensuring backwards compatibility through revisions of the IEC standard. The latest edition does not make installed devices and systems incompatible; rather, EDDL files can be uploaded to the control system without the need for retraining. Moreover, just like the graphical enhancements in the 2006 edition, the current updates have been incorporated without relying on executable software. All unique advantages of the original technology still apply, including:

• Ability to incorporate diagnostics for critical devices in DCS operator consoles, where they become a natural part of daily maintenance procedures.

• Consistent diagnostic look and feel regardless of manufacturer, protocol or device type. Content and structure for system displays are defined by the device manufacturer.

• Ability to keep systems current with new device types and versions without the difficulties associated with installing software and license key overhead.

• Elimination of obsolescence by future versions of Windows®, service packs or .Net framework, thus preserving investments.

• Compact, bundled files that are easily downloaded or e-mailed.

• Third-party interoperability tested as a package during device registration.

• Automatic population of a common OPC server shared by all devices.

For more information about EDDL, please visit www.eddl.org.

SUPPLIERS PUTTING EDDL TO WORK

Emerson is a strong supporter of EDDL enhancements defined in IEC Standard IEC 61804-3. Employing a human-centered design approach, Emerson has used the new EDDL enhancements to implement a series of “Device Dashboards” in their AMS Device Manager and 475 Field Communicator products.

Foxboro Field Device Manager from Invensys integrates EDDL and DFT technologies for unmatched device configuration, commissioning, and diagnostic support. The EDDL language used by instrument manufacturers to create Device Descriptions has changed dramatically since its introduction two decades ago. In June 2006, the Foxboro Field Device Manager was the first product to market with new EDDL features such as trend charts, data gauges, and embedded images. With the help of EDDL, Foxboro configuration tools seamlessly integrate function blocks for FOUNDATION fieldbus devices and conventional points, all with a consistent look and feel. EDDL is useful in providing at-a-glance online dashboards displaying multiple dynamic variables such as process, device performance, and device health variables.

The Fieldbus Builder FF tool, internal to the ABB System 800xA engineering environment, has been updated to incorporate EDDL functionality in system version 5.1. The tool has been updated to use the menus, visualization, and methods features of EDDL to significantly enhance the usability of the tool and further extend the benefits of using System 800xA and FOUNDATION fieldbus HSE.

General Electric (GE) has also played a significant role in host support for EDDL.
Looking for the Right Partner with the Right Skills?
We’re All You Need.

FieldConnex®
The best solutions are usually very simple.

Process automation is very much like other aspects of life. Complex systems are driven by astonishingly simple processes. Consider fieldbus. It offers straightforward communication from the control system to each field device. Control commands, closed loop control, and monitoring enable the management of the most complex processes.

FieldConnex® goes one step further. It simplifies the installation and the infrastructure, allowing you to design a fieldbus topology for your specific application. The High-Power Trunk, for example, transmits data and supplies power using only one cable and limits energy at the spur rather than the fieldbus trunk cable. Our Advanced Diagnostic Module in combination with a powerful commissioning wizard continuously monitors the fieldbus physical layer providing precise and detailed analysis. Intelligent components from the specialists who simply know what fieldbus is all about.

Pepperl+Fuchs Inc.
 Twinsburg, Ohio
 330.486.6000
 FieldConnex.info

PEPPERL+FUCHS
PROTECTING YOUR PROCESS

Microcyber

FOUNDATION™ Fieldbus/Profibus PA Communication Board
- Same Hardware for FOUNDATION™ Fieldbus & Profibus PA
- FISCO Certified
- Customized Board

Technical Service
- Certification Pre-Test
- Certification Test Support
- System Integration Test Support

Fieldbus Development Toolkit
- Drive Your Own Fieldbus

Tel: +86-24-63602051
Fax: +86-24-83602961
E-mail: jin.guangshu@microcyber.cn
Website: www.microcyber.cn/en/index.asp
Global Events Program Expanding to Serve Fieldbus Community

Seminars, roadshows, exhibitions and training will focus on FOUNDATION fieldbus

No matter where you are located, it will be easy to find an event related to FOUNDATION fieldbus during 2011. The Fieldbus Foundation is planning an expanded worldwide program of fieldbus educational seminars, roadshows, technology exhibitions and other informative activities during the coming year. These events will serve the needs of process automation end users, developers, engineering firms and other interested stakeholders.
The Fieldbus Foundation conducts one-day end user seminars covering all aspects of Foundation automation infrastructure management.

North & South America

The Fieldbus Foundation’s 2011 North & South America end user seminar program is intended to help process plant personnel gain a better understanding of the economic benefits of the Foundation automation infrastructure. Seminars are planned for:

- Carson, California May 24, 2011
- Rio de Janeiro, Brazil June 16, 2011
- Mexico City, Mexico Aug. 23, 2011
- Calgary, Alberta Sept. 20, 2011
- Fort McMurray, Alberta Sept. 22, 2011
- Detroit, Michigan Oct. 11, 2011
- Corpus Christi, Texas Nov. 7, 2011
- Baton Rouge, Louisiana Nov. 9, 2011
- Beaumont, Texas Nov. 10, 2011

Oriented towards process control end users and engineering firms, the one-day seminars cover all aspects of Foundation automation infrastructure management. The seminars address core technology topics such as Open, Scalable Integration/Segment Design & Layout; Process Integrity/Safety Integrity Levels (SIL) and Safety Instrumented Functions (SIF); and Business Intelligence/Maintenance & Troubleshooting. Each topic is discussed in detail for 45 minutes to one hour, followed immediately by a hands-on demonstration of 15-20 minutes to reinforce the subject matter. In addition, there is discussion of newer advances such as Field Diagnostics, Control in the Field, and Wireless, and end user speakers present case studies about their fieldbus applications. The seminars conclude with a demonstration addressing Electronic Device Description Language (EDDL) technology.

The Fieldbus Foundation will provide each 2011 end user seminar participant with a certificate that can be used for PDH hours, as well as hard copies of presentation materials. Lunch is also included for all attendees.

Device developers may require assistance in implementing Foundation technology in their instrumentation product line. That is why the Fieldbus Foundation established a complete developer training curriculum. Supplier personnel can get on the “Fast Track to Fieldbus” by attending one of these informative courses, to be offered at the foundation’s facility in Austin, Texas.

The “Introduction to Foundation Fieldbus” course is designed for developers, end users, marketing professionals, applications engineers, system integrators and others interested in obtaining a fundamental knowledge of Foundation technology. Students become familiar with the basic concepts and new terminology related to the Foundation integrated architecture. They gain an understanding of the strategies for wiring and installation of a fieldbus network. Special emphasis is placed on design issues such as power requirements, device types and topologies.

This introductory course has been updated to include new information about grounding and shielding, as well as Safety Instrumented Functions (SIF).

The “Advanced Principles of Foundation Fieldbus” course is designed for manufacturers and developers of fieldbus hardware and software. It is best suited for development engineers, test engineers, and all who wish to understand the detailed inner workings of a Foundation fieldbus device. The course covers the major tools used by Foundation device developers. Students gain an understanding of the basics of the bus monitor and apply this tool in interactive
exercises demonstrating fieldbus communications and the use of filters for network troubleshooting. The curriculum also addresses the foundation’s automation infrastructure for communications between fieldbus devices and field instruments and hosts.

Europe, Middle East & Africa

As the final delegates left the end user seminar in Ruwais, Abu Dhabi, United Arab Emirates, on December 9th, 2010, the 2010 schedule of EMEA end user events drew to a close. Meanwhile, members of the German Marketing Committee were making last minute preparations for the first event of the New Year — the 6th German End User Conference held in Leverkusen, Germany, in January 2011.

Throughout 2010, the Fieldbus Foundation EMEA national marketing committees had participated in, or hosted, a range of seminars, roadshows, conference presentations and exhibitions across the EMEA region in Germany, South Africa, Poland, Bulgaria, France, Italy, Turkey, UK, Hungary, the Netherlands, Czech Republic, Saudi Arabia, Kuwait and UAE.

A strong presence at local exhibitions and roadshows, and the organization of educational seminars for an end user and EPC audience, is an integral part of the Fieldbus Foundation EMEA marketing plan. Supported by the Fieldbus Foundation EMEA Executive Advisory Council and its EMEA Steering Committee, the national marketing committees aim to actively promote the fundamental message that the FOUNDATION solution delivers open, scalable integration; process integrity; and business intelligence across the plant enterprise.

The level of detail presented at the events depends upon the region and target audience, but attendees typically learn about FOUNDATION technology and fieldbus project economics (CAPEX and OPEX savings), segment design, system startup, commissioning and maintenance, asset management, diagnostics, FOUNDATION fieldbus for Safety Instrumented Functions (FF-SIF), FOUNDATION in hazardous areas, and Control in the Field (CIF). Wherever possible, end users and industry experts are invited to share their own project implementation experiences, and the ensuing discussion forums and Q&A sessions always prove to be valuable for all parties. Some events also offer delegates the opportunity to meet sponsoring member companies at tabletop displays.

The cornerstone of the 2011 EMEA event schedule is the provision of three new FOUNDATION fieldbus demonstration units to ensure a consistent, standardized and vendor-neutral presentation of the full range of FOUNDATION technology features. Each of the new units will feature one of three host systems from Emerson Process Management, Endress+Hauser and Honeywell, with a selection of power supplies, diagnostics, wiring components and junction boxes from MooreHawke, MTL, Pepperl+Fuchs or R. STAHL; and field devices and displays from ABB, Emerson Process Management, Endress+Hauser, Honeywell, Moore Industries, MTL, Pepperl+Fuchs, R. STAHL or Yokogawa.

While final plans for 2011 events in some regions are still taking shape, the calendar is filling up with activities including roadshows, seminars, conferences, presentations and participation in trade exhibitions. Since 2009, the Fieldbus Foundation Southern Africa Marketing Committee (FFSAMC) has regularly participated in the annual CONTROL series of roadshows — dedicated control, measurement and instrumentation exhibitions.
Attendees can view fieldbus technology exhibits at CONTROL roadshows in South Africa.

have begun the organization of its Multaqa 2011 end user conference and exhibition in Abu Dhabi, United Arab Emirates. Traditionally held at a hotel resort venue in December, the sixth Middle East end user conference will be a two-day event offering an extensive program of technical and end user presentations, technology demonstrations, a table top exhibition, and several opportunities for discussions and networking.

Each year, the Fieldbus Foundation German Marketing Committee maintains a high profile at the annual Hannover Fair in April. This year it joined the HART Communication Foundation, FDT Group, and Profinbus International at a common Field Communication Lounge — a 450-square-meter stand including a large shared forum area as well as separate zones for each association. Technology demonstrations, member company kiosks, and a comprehensive presentation program including a panel discussion involving all parties, were among the highlights.

Final dates for seminars in Italy, France and the UK will be announced in due course on the Fieldbus Foundation website.

Marc Van Pelt, Vice President – Fieldbus Foundation EMEA Operations, and Chairman – Fieldbus Foundation EMEA Steering Committee, is looking forward to a dynamic year of marketing activities across the EMEA region. “We are committed to delivering a high level of technical training to established and prospective end users of fieldbus technology and we are delighted to work with so many end
### FOUNDATION Fieldbus Events Worldwide

#### EVENTS IN THE AMERICAS

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>EVENT INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin, Texas, USA</td>
<td>May 17, 2011</td>
<td>Developer Training – Intro to FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Austin, Texas, USA</td>
<td>May 18-20, 2011</td>
<td>Developer Training – Advanced Principles of FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Carson, California, USA</td>
<td>May 24, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Rio de Janeiro, Brazil</td>
<td>June 16, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Mexico City, Mexico</td>
<td>Aug. 23, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Calgary, Alberta, Canada</td>
<td>Sept. 20, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Fort McMurray, Alberta, Canada</td>
<td>Sept. 22, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Detroit, Michigan, USA</td>
<td>Oct. 11, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Corpus Christi, Texas, USA</td>
<td>Nov. 7, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Baton Rouge, Louisiana, USA</td>
<td>Nov. 9, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Beaumont, Texas, USA</td>
<td>Nov. 10, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Austin, Texas, USA</td>
<td>Nov. 15, 2011</td>
<td>Developer Training – Intro to FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Austin, Texas, USA</td>
<td>Nov. 16-18, 2011</td>
<td>Developer Training – Advanced Principles of FOUNDATION Fieldbus</td>
</tr>
</tbody>
</table>

#### EVENTS IN EMEA (EUROPE, MIDDLE EAST, AFRICA)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>EVENT INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Town, South Africa</td>
<td>February 3, 2011</td>
<td>CONTROL Roadshow</td>
</tr>
<tr>
<td>Durban, South Africa</td>
<td>March 17, 2011</td>
<td>CONTROL Roadshow</td>
</tr>
<tr>
<td>Frankfurt, Germany</td>
<td>March 22, 2011</td>
<td>Developer Training – Intro to FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Frankfurt, Germany</td>
<td>March 23-25, 2011</td>
<td>Developer Training – Advanced Principles of FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Zlatibor, Serbia</td>
<td>April 2011</td>
<td>FOUNDATION Fieldbus Fundamentals Presentation</td>
</tr>
<tr>
<td>Hannover, Germany</td>
<td>April 4-8, 2011</td>
<td>Industrial Automation Exhibition, Hannover Messe</td>
</tr>
<tr>
<td>Johannesburg, South Africa</td>
<td>May 17-19, 2011</td>
<td>PROCESS 2011 Exhibition, FOUNDATION Technology Training</td>
</tr>
<tr>
<td>Kalmhout, Belgium</td>
<td>May 19, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Plock, Poland</td>
<td>May/June 2011</td>
<td>FOUNDATION Fieldbus Live – Instrumentation Roadshow</td>
</tr>
<tr>
<td>Windhoek, South Africa</td>
<td>June 7, 2011</td>
<td>CONTROL Road Show</td>
</tr>
<tr>
<td>Walvis Bay, South Africa</td>
<td>June 9, 2011</td>
<td>CONTROL Road Show</td>
</tr>
<tr>
<td>Secunda, South Africa</td>
<td>July 21, 2011</td>
<td>CONTROL Road Show</td>
</tr>
<tr>
<td>Port Elizabeth, South Africa</td>
<td>Aug. 18, 2011</td>
<td>CONTROL Road Show</td>
</tr>
<tr>
<td>Frankfurt, Germany</td>
<td>Sept. 20, 2011</td>
<td>Developer Training – Intro to FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Frankfurt, Germany</td>
<td>Sept. 21-23, 2011</td>
<td>Developer Training – Advanced Principles of FOUNDATION Fieldbus</td>
</tr>
<tr>
<td>Linz, Austria</td>
<td>Oct. 4-6, 2011</td>
<td>FOUNDATION Fieldbus Presentation, SMART Automation</td>
</tr>
<tr>
<td>Vanderbilpark, South Africa</td>
<td>Oct. 20, 2011</td>
<td>CONTROL Roadshow</td>
</tr>
<tr>
<td>University of Miskolc, Lillafüred, Hungary</td>
<td>Oct. 24-26, 2011</td>
<td>DCS17 Conference</td>
</tr>
<tr>
<td>STC Brielle, The Netherlands</td>
<td>Nov. 10, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Abu Dhabi, UAE</td>
<td>December 2011</td>
<td>Multaqa 2011 FOUNDATION Fieldbus End User Conference</td>
</tr>
</tbody>
</table>

#### EVENTS IN ASIA/PACIFIC

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>EVENT INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osaka, Japan</td>
<td>March 11, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Tokyo, Japan</td>
<td>March 11, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Vungtao, Vietnam</td>
<td>April 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Bangkok, Thailand</td>
<td>April 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Singapore</td>
<td>May 12, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Kaohsiung, Taiwan</td>
<td>July 6, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Urumqi, China</td>
<td>July 21, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Mumbai, India</td>
<td>Sept. 20-23, 2011</td>
<td>Automation 2011 Exhibition</td>
</tr>
<tr>
<td>Seoul, Korea</td>
<td>October 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Shanghai, China</td>
<td>Oct. 20, 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Tokyo, Japan</td>
<td>Nov. 16-18, 2011</td>
<td>JEMIMA Exhibition</td>
</tr>
<tr>
<td>Rayong, Thailand</td>
<td>November 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Kuala Lumpur, Malaysia</td>
<td>November 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Jakarta, Indonesia</td>
<td>December 2011</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
<tr>
<td>Australia</td>
<td>To be determined</td>
<td>FOUNDATION Fieldbus End User Seminar</td>
</tr>
</tbody>
</table>
Yokogawa
In 2011, Yokogawa will continue to contribute to Foundation fieldbus seminars, exhibitions, training and any other events all over the world with leading-edge technology and customer-centric solutions, including the Plant Asset Effectiveness Optimization Service InsightSuite AE, the Distributed Control System CENTUM, the Plant Resource Manager PRM, and various intelligent and multi-sensing field devices.
Yokogawa is also supporting fieldbus training sites in the Asia/Pacific region, including Japan and Thailand, which have recently gained Foundation Certified Training Program (FCTP) approval.

MooreHawke
MooreHawke, a division of Moore Industries-International, Inc., exhibited at all of the Foundation fieldbus end user seminars in North America in 2010. In addition, MooreHawke participated in the program by demonstrating to attendees how to put together a fieldbus system using various physical layer components. The demonstration included step-by-step handling of wire, wiring, power supplies, and device couplers — showing how Foundation fieldbus is different from 4-20 mA wiring, but not complex. This was followed by a walk-thru review of various physical layer components on each of the featured demo stands.

Emerson Process Management
Emerson is an active participant in Fieldbus Foundation activities, seminars, and trade shows around the world. It participated in all the end user seminars held in North America in 2010 and will continue to do so in 2011. Using its DeltaV control system and AMS Device Manager, Emerson participates in these seminars by showing how the vast amount of diagnostic information enabled with Foundation technology provides customer value.

Pepperl+Fuchs
Pepperl+Fuchs is supporting Foundation fieldbus seminars and events on a global basis. The company is excited about the revamped seminar program including live demos. Experts from Pepperl+Fuchs are present at the seminars to explain fieldbus technology, and often play a central role in the event organization. A recent highlight was the German Foundation Fieldbus Conference where the newly updated Advanced Diagnostics Manager found great interest from the more than 70 attendees.

Invensys
Invensys fieldbus experts participate in various Foundation technology events, explaining how fieldbus engineering, commissioning, and plant start-up are made easy. Invensys’ Foxboro I/A Series for Foundation fieldbus provides a high availability platform solution with superior device management and fieldbus control in the field.

R. STAHL
R. STAHL is an active member of most Fieldbus Foundation marketing committees worldwide and participates in nearly all related events and trade shows. During last year’s ME Roadshow, in cooperation with ISA, R. STAHL presented the latest fieldbus technology developments in front of several hundred attendees. As a German company, R. STAHL is closely involved in German Foundation fieldbus activities such as the successful end user seminar at Bayer in Leverkusen. It also participated in the Hannover Fair as part of the Field Communication Lounge.

CONTINUED FROM PAGE 16

users across the region who can share their own experiences of implementing Foundation technology into their own plants,” said Van Pelt. “By discussing real case studies and taking part in practical technology demonstrations, delegates get a real taste of how Foundation can fit into their enterprise.”

Asia/Pacific
A full slate of Foundation fieldbus events is planned for Asia/Pacific during 2011. This ambitious program, which includes 18 end user seminars and two technology exhibitions, is intended to serve all of the established and developing industrial markets throughout the region.

End user seminars are planned for: Australia; Singapore; Mumbai, India; Shanghai and Urumqi, China; Seoul, Korea; Osaka and Tokyo, Japan; Kaohsiung, Taiwan; Bangkok and Rayong, Thailand; Vungtto, Vietnam; Kuala Lumpur, Malaysia; and Jakarta, Indonesia.

Foundation fieldbus technology exhibitions will be staged at Automation 2011, September 20-23, in Mumbai, India; and at JEMIMA 2011, November 16-18, in Tokyo, Japan.

For additional information about Foundation fieldbus events around the world, please visit www.fieldbus.org.
Advancements in Physical Layer Testing Assist Device Developers

Consistent testing of H1 fieldbus devices ensured via predefined test cases

Seeking to enhance FOUNDATION fieldbus physical layer testing, the Fieldbus Foundation charged its Physical Layer Maintenance Team with identifying improvements to the current H1 Physical Layer Test Specification (FF-830). The Physical Layer Working Group has analyzed current test specifications and generated improved test cases. This work, in conjunction with test specifications for power supplies, couplers, and cable for improved fieldbus system interoperability, supports updated test specification FF-830 2.0, which will be published in the first quarter of 2011.

In addition, the foundation has been developing physical layer testing services using an automated test tool that supports the current specification, FF-830 1.5, and a number of new test cases. Additional test cases will be developed for compliance with the updated specification.

CONTINUED ON PAGE 20
The Fieldbus Foundation is also preparing to launch an independent physical layer testing service for manufacturers of FOUNDATION fieldbus devices. This service will reduce the cost of device development by eliminating the need for suppliers to purchase dedicated tools or services for physical layer testing, and will ensure consistent testing through a predefined set of test cases.

According to Fieldbus Foundation Director – Fieldbus Products, Stephen Mitschke, prototype devices are needed to help in developing the physical layer test system and process. During the startup testing phase, H1 fieldbus device manufacturers will be able to send equipment to the foundation for physical layer testing at no charge, subject to lab availability. Suppliers will be given the test results to assist with internal product development. The detailed test report findings will provide a preview of new test cases in FF-830 2.0 and offer feedback for improving device interoperability.

For more information, please contact the Fieldbus Foundation at (512) 794-8890, Ext. 21, or send an e-mail to member.services@fieldbus.org.

**CONTRIBUTIONS BY LEADING COMPANIES**

**Pepperl+Fuchs**

Pepperl+Fuchs has supported the Fieldbus Foundation’s Physical Layer Maintenance team from the very start. Gunther Rogoll, head of the company’s product group FieldConnex® Fieldbus Infrastructure, and his engineers contributed knowledge gained during the development of the Power Hub System with advanced diagnostics.

**Yokogawa**

The Foundation fieldbus Physical Layer Maintenance Team includes two Yokogawa engineers. One is from the host side and the other is from the device development section. They are both experienced H1 physical layer circuit designers who have contributed to an effective test specification. In particular, the Yokogawa engineers played a significant role in the jitter tolerance test, which is intended to keep FOUNDATION fieldbus communications robust.

**Emerson Process Management**

Emerson’s involvement in the Physical Layer Maintenance Team has lead to enhancements to test specifications to improve interoperability in fieldbus customer applications. Test specification enhancements include H1 Physical Layer Test Specifications for Fieldbus Devices (FF-830), Fieldbus Power Supplies (FF-831), Fieldbus Device Couplers (FF-846) and Fieldbus Cables (FF-844). In addition, EMC Testing requirements for fieldbus devices were proposed to be included in the next update to the IEC 61326-2-5 specification.
Yokogawa’s InsightSuiteAE service solutions show you how to operate your plant assets at optimum efficiency while keeping maintenance costs to a minimum. One such solution is field digital baseline tuning. With this service, we can help you maximize the effectiveness of your FOUNDATION™ fieldbus devices by making all asset conditions clearly identifiable at a glance, improving asset availability, and enabling a planned, predictive, and condition-based maintenance (CBM) approach.
New DesignMATE™ Tool Simplifies Fieldbus Implementation

Software audits segment layouts for conformance with industry standards

DesignMATE™, a complete software tool for planning, validation and documentation of FOUNDATION fieldbus H1 segments, is now available from the Fieldbus Foundation. User-friendly DesignMATE automatically audits segment layouts for conformance to the FOUNDATION physical layer specification, which is based on the international IEC 61158-2 (Type 1) standard. This assures end users their fieldbus infrastructure will work with desired parameters such as cable length, number and type of installed devices, and selected power supplies.
“With the DesignMATE software, end users can simplify the implementation of FOUNDATION technology,” said Fieldbus Foundation Director – Fieldbus Products, Stephen Mitschke. “This tool verifies that a fieldbus physical layer conforms to accepted industry standards and is designed for optimal performance and reliability. It is ideally suited for engineering firms or system integrators designing new or expanded process plants, as well as plant control engineers or technicians adding new devices to existing fieldbus segments.”

Mitschke added, “DesignMATE helps in foreseeing any issues with the configuration of a fieldbus system prior to implementation. It allows users to perform rapid calculations, eliminate human error, improve efficiency, and minimize the amount of paperwork required during the segment design phase.”

Available for free download on the Fieldbus Foundation’s website (www.fieldbus.org), the DesignMATE software provides an intuitive graphical user interface and mouse support, enabling fieldbus segment design “on the fly” with drag-and-drop capabilities. The tool displays fieldbus segments in the form of an exportable image of a stylized topology. A printable report in Rich Text Format (.rtf) is also available. Users can analyze and check key physical layer parameters, such as supply voltage, load conditions at all terminals of power supply, fieldbus couplers and field instruments. An error log indicates deviations from the FOUNDATION specification in clear text visuals for immediate remedy by the user.

DesignMATE also has the unique capability to consider ambient temperature and cable parameters, which can be easily set in the respective dialog windows. Default values for spur length or device load current only need to be established once.

Additionally, the DesignMATE tool is equipped with libraries for all components in the typical FOUNDATION fieldbus infrastructure, including power supplies, fieldbus couplers for both safe and hazardous plant areas, and field instruments. Fieldbus devices from a wide range of automation equipment manufacturers are available in the software. An easy-to-use device editor is included for creation of custom instrument libraries.
Wireless I/O Makes Progress with Successful Lab Tests

WIO provides open fieldbus infrastructure incorporating both HSE and wireless

The Fieldbus Foundation has released its High Speed Ethernet Remote I/O (HSE-RIO) preliminary specification for review by members and is now validating wired HART® and WirelessHART™ integration specifications. Currently under test are laboratory prototypes of Wireless and Remote I/O (WIO) gateways from three major manufacturers; additional prototypes will be tested later in 2011.
Within the FOUNDATION automation architecture, H1 (31.25 kbit/s) and HSE (100 Mbit/s) provide a distributed function block capability with HSE serving as a larger pipeline with increased speed and throughput. The WIO development expands these capabilities by establishing open, non-proprietary specifications for a wired HSE backhaul network, a wireless HSE backhaul integrating various wireless gateways, and an interface to wireless field device networks. HSE-RIO technology provides an efficient way to bring large concentrations of discrete and analog field I/O from modular devices to the control room using a high-speed HSE connection. The addition of remote I/O further tightens the integration of process instrumentation within a FOUNDATION control system infrastructure.

At a WIO Validation Team meeting in November 2010 at the Fieldbus Foundation’s facility in Austin, Texas, the first WIO gateway interconnecting WirelessHART devices to a wireless backhaul network was tested successfully. The WirelessHART process parameters were mapped into transducer blocks in the gateway according to the specification, and communicated over the wireless backhaul network using the Fieldbus Foundation’s HSE protocol. As part of the proof of concept testing for WIO, the foundation’s Interoperability Test Kit (ITK) system successfully tested the WIO gateway over a 300 Mbit/s wireless Wi-Fi backhaul network.

According to Dave Glanzer, Fieldbus Foundation Director of Technology Development, the test results are an important milestone for the WIO effort. “The Fieldbus Foundation’s WIO project will open the door to utilization of an open, interoperable fieldbus automation infrastructure incorporating both HSE and industrial wireless applications,” said Glanzer. “This technology program has significant implications for the future of industrial automation.”

The next steps in the WIO program include final validation of the wired HART and WirelessHART specification. This development will give automation suppliers the opportunity to develop full WIO gateways initially running on a wired HSE backhaul. At the same time, the Wireless Sensor Interface Team and Fieldbus Foundation/ISA Cooperation teams will work to finalize the first draft of the wireless backhaul specifications and address key requirements such as security.

The WIO solution employing HSE-RIO allows industrial plants to access high data requirement devices directly in the fieldbus host system via HSE. Using gateways functioning like a smart remote terminal unit (RTU), it brings all forms of conventional I/O into the native fieldbus environment easily.
Improved Fieldbus Operations with Advanced Diagnostics

Eastman Chemical installs fieldbus system designed for hazardous environment

Chris Williams
I&C Engineer
Eastman Chemical Company

The Eastman Chemical Company in Columbia, South Carolina, uses FOUNDATION fieldbus technology and Emerson DeltaV hardware throughout its relatively non-hazardous facility. This system has functioned so well, Eastman decided to install fieldbus technology in a second plant. The challenge was to figure out how to install a FOUNDATION fieldbus system similar to the one in the first plant in a second plant that has a very different environment.
The Challenge

Our second plant has many Class I Div. 1 and Class I Div. 2 hazardous areas with processes that are not only explosive but also extremely corrosive. Traditional, intrinsically safe FISCO (Fieldbus Intrinsically Safe Concept) segments typically have some amount of signal loss and only permit a maximum of four devices with short segments. We wanted to install a FOUNDATION fieldbus system that would function reliably in a harsh and hazardous environment and maximize intrinsically safe segment capacity. Also, I wanted our personnel to be able to work on the instrument in the field.

FISCO provides a way around the limitations of normal intrinsic-safety. It makes more voltage and current available in hazardous locations — 12.8 V and 115 mA. Trunk and spur lengths are 1000 m and 30 m respectively, it verifies safety, system certification is not required, and FISCO avoids having to segregate live-workable and non-live-workable parts of the network in the field junction box.

One of the hesitations I had bringing fieldbus technology with restricted voltage into the plant was the fact that a system can be clean when it goes in, but with our corrosive environment, connectors get dirty, and boxes start to fatigue. Rust and corrosion degrade communication over time and lead to network instabilities. These conditions also create additional resistance and capacitance, which results in voltage drops. Random and intermittent communication problems are hard to pinpoint and eliminate. Usually you find them only after the plant goes down. I wanted to be able to find those problems before they caused a shutdown. Also, I wasn’t sure if 12.8 V would be enough to compensate for corrosion, given that the fieldbus devices require at least 9 V to operate.

A Possible Solution

In an effort to find the best solution to our challenge, we attended a seminar at Robert E. Mason in Charlotte, North Carolina, where we saw a presentation about the Advanced Diagnostic Module (ADM). Pepperl+Fuchs claimed that its ADM would not only save time during startup and commissioning, but would also detect degrading conditions or faults occurring on fieldbus segments. Any change in the installation, such as those caused by corrosion or those unnoticed by the operators, would be detected before the change becomes critical to plant performance.

The ADM is part of Pepperl+Fuchs’ FieldConnex product line for fieldbus communications. FieldConnex allows you to design your fieldbus topology specifically for your application. While the fieldbus transmits the data, FieldConnex provides the infrastructure: power supplies, installation equipment, and accessories. The High-Power Trunk concept (HPT) together with FieldBarriers provides a new approach to creating intrinsically safe fieldbus segments. The entire installation is continuously monitored by the ADM integrated in the FieldConnex power hub.

The High-Power Trunk

Rather than limiting the amount of energy on the fieldbus trunk cable to intrinsically safe or nonincendive levels, the HPT limits the energy on the spur connections to the instruments. Using FISCO with the HPT, the energy on the trunk is increased to 500 mA rather than 115 mA. This increases the amount of energy available for field instruments and facilitates a consistent installation design regardless of the area classification. By limiting the energy in the field with a FieldBarrier rather than in the control room, power is more efficiently distributed to the instruments where it is required. As a result, the segment protection devices are similarly installed for hazardous or general-purpose applications. Consistency, cable runs, and cost savings are all increased with HPT.

Another benefit of HPT allows users to standardize on one power conditioning system with optional redundant modules for all areas of the plant. Supplying 30 V / 500 mA allows users to achieve maximum cable lengths and maximum loading without using repeaters.

FieldBarriers

FieldBarriers are the core of the HPT. They are mounted near the field devices to provide short-circuit protection as well as energy limitation for explosion protection. They guarantee that the segment remains in operation even during a fault condition on a spur. The HPT expands the FISCO validation methods by considering each spur connection separately. FieldBarriers can be daisy-chained on the trunk and enable the field devices to be serviced without the need for a hot work permit. And they can be used in FISCO, FNICO, hazardous, as well as general-purpose installations.

The Installation

When we brought our original plant system online, we did it using the standard method: pulling the trunk cables apart, and performing resistance and capacitance checks. When we had a problem, the technicians went out into the field and determined if it was coming from the trunk system, spur cables, or the instrumentation. It was rather time-consuming to get the bugs out of the system at startup. Yet, once we got it online and commissioned, it worked very well. The instrumentation for FOUNDATION fieldbus eliminated the need for technicians to be out in the field doing calibration checks, putting scaling factors inside transmitters, and validating the 4-20 mA coming back. Startup
FieldBarriers with FISCO spur connections.

was extremely fast. In just one day we commissioned and brought over 40 instruments on line.

For our second plant installation, we were told that we didn’t need to go through all of that. Supposedly, with advanced diagnostics, we could shoot our networks and scan them before we hung the instrumentation. After hanging the instruments, we could scan the network again and compare the noise levels, power draws, and the health of the network.

But I wasn’t convinced that this would work. I do know that installation practices have a significant effect on the quality of communication. So, we were very careful to install our system perfectly. We installed the first four segments and did all the initial checks: we walked down all the bricks and terminations, did the resistance and capacitance checks, performed a manual scope sweep, and checked each instrument with a handheld configurator. Then, we used the ADM to validate all of that information — and it matched perfectly.

The Advanced Diagnostic Monitor

In fact, the ADM caught a problem on one of our bricks that the handheld communicator did not catch. It was over-terminated, but not to the point that it violated the minimum point where FOUNDATION fieldbus wouldn’t run. We still had a running system, and we weren’t getting any communication errors, yet the network was unhealthy. The ADM caught it. We had failed to turn off the built-in terminating resistor on one of the bricks. My confidence in advanced diagnostics was starting to grow.

The next system we brought on line had eight segments. This time we made sure that the terminators were right and the trunk cables were terminated correctly. After we deter-
mined that the segments were good, I used the advanced diagnostic monitor to commission all eight segments. It took only 20 minutes and actually found two problems that my field guys missed: one where they forgot to turn on the termination at the end of the field, and another where the polarity was reversed. The errors were corrected in ten minutes, and the segments were back up on line and completely healthy.

After that, we connected 40 instruments on the segments and used only the diagnostic system to validate. Not one had a problem. In fact, even our longest run — 1500 feet — came on line with no problem, as quickly and as easily as the run that was five feet from the cabinet.

Currently, we have six different areas in my facility where we’ve installed Foundation fieldbus using the High-Power Trunk concept. We’ve stopped using the handheld, and we no longer haul the oscilloscope out to the field. Once the system is installed, I do the sweep remotely, and we are ready to go. I have total confidence in the ADM.

Even More Features

The diagnostic system also provides a commissioning wizard, alarming and data logging, and a built-in oscilloscope for displaying in-depth detail of fieldbus signals. Once all the instrumentation is on the network, the software allows me to enter the tag names for each node address manually on a particular segment. During troubleshooting, it’s easy to see which instrument has the problem without ever going out into the field. The commissioning wizard is easy to use and very intuitive.

The diagnostics feature is equally as reliable. It measures device signal level, proper termination, and cable continuity. It provides a baseline report and comprehensive system documentation. The baseline is continuously compared against actual values and if there’s a problem, it tells me exactly what that problem is, indicates possible causes, and then offers possible solutions. Best of all, I’ve never had to go out into the field to diagnose a problem.

The physical layer diagnostic module captures snapshots of all values and can store that data for up to two years for long-term trending. Because it has the ability to create a visual representation of the digital fieldbus communications coming from the control room, it truly provides an “extra set of eyes” on communications — making you aware of a problem before it arises. As a matter of fact, we were having trouble with a valve, and the manufacturer tried to tell me that it was because I had an unhealthy network. I showed him some of the screen shots from the software — he’s never mentioned the health of my network again.

Another neat feature of the system is the remote software. When I commission the segments, I do it remotely,
from the comfort of my office. I don’t need to be out in the field fumbling with my laptop. I can monitor the network remotely — even when I’m at home.

We’ve never had any issues or compatibility problems with any of our vendors’ fieldbus products. We have Endress+Hauser, Emerson Rosemount, Yokogawa, Fieldview, Smar, and all of it is plug-and-play.

The amount of time that we’ve saved with advanced diagnostics has been dramatic. It actually takes longer to walk down the system to set the jumper switches and the boxes than it does to commission the system. The physical walk-down and commissioning for the first four-segment system took a day and a half; on the following eight-segment system, the physical walk-down took about 60 minutes and the commissioning took a mere 20 minutes. Our confidence level in the network also increased dramatically. When the ADM certified that the system was good, we knew it was good.

**From Incident-Based Maintenance to Predictive Maintenance**

Advanced diagnostics has enabled me to go from incident-based maintenance to predictive maintenance. When you have a chemical plant that is running 24/7, and an instrument failure of any kind will bring your operation to a halt, you need a communication system that you can rely on: one with greater power capacity, signal quality, consistency, and efficiency. The ADM delivered on every requirement.
**RID14 AND RID16 Foundation Fieldbus Field Indicators**

- Brilliant 8-channel field indicator
- Function block interconnection
- NEW! Listener Mode reduces costs and traffic on the bus
- Further function blocks like PID, arithmetic or integrator block support flexibility
- Advanced Diagnostic block offers detailed information on status or failures
- LAS capable
- Various housing designs in glass-reinforced plastic, aluminum or stainless steel

**Endress+Hauser** • www.products.endress.com/RID14 • www.products.endress.com/RID16

---

**Phoenix Contact Releases New Solutions for Foundation Fieldbus**

Phoenix Contact has added two new families to its ever-growing process infrastructure portfolio. A new line of preconfigured junction boxes makes it easy to connect and protect process instruments, and a redundant fieldbus power supply can prevent downtime in critical applications.

In the field, FB-...-SS stainless steel and FB-...-AL aluminum enclosure assemblies include internal components for trunk connection, termination, surge protection and flexible shielding for easy connection. The user can snap in the necessary type and number of modular device couplers, FB-2SP or FB-ISO, based on the hazardous area and isolation requirements. This reduces installation costs by avoiding unused capacity and minimizing enclosure size. At the same time, a one-to-one coupler to instrument relationship increases operational integrity.

In the control cabinet, the redundant power supply features a per-segment modular base for connectivity and signal conditioning. This improves overall process integrity while saving critical cabinet space and avoiding unused capacity cost. Power modules include Auto Current Balance (ACB) technology and Preventive Function Monitoring with an integrated remote indication contact per module.

The overall breadth of the Phoenix Contact offering provides the solution to almost any process automation challenge.

**Phoenix Contact** • www.phoenixcontact.net/processfieldbus

---

**Yokogawa Announces Enhanced Stardom FCN-RTU Low Power Autonomous Controller**

The Stardom FCN-RTU low power autonomous controller is a key component for remote asset management. Registered as an Integrated Host Class system, it brings Foundation Fieldbus technology to inhospitable (-40 to 70°C) and hazardous (FM non-incendive, ATEX Type “n”, and CSA) locations. With Foundation Fieldbus technology, operation expenditure (OPEX) is lowered by making it possible to diagnose and maintain devices from a central location, eliminating the need for periodic patrols of remotely located facilities such as oil and gas wellheads.

To make it easier to introduce Foundation Fieldbus technology to new applications, Yokogawa has enhanced the FCN-RTU's engineering tool and improved the hardware’s reliability and functionality.

**Enhanced software:** Improved Foundation Fieldbus engineering tool • An intuitive look and feel interface including drag and drop operations for device definition, and IEC61131-3-like logic programming • Improved reusability of program code • Compatible with Windows™ 7 for a wider selection of PCs.

**Enhanced hardware:** Reliability • The introduction of error check and correct (ECC) memory prevents software malfunctions caused by memory errors • A battery voltage drop detection function provides timely notification to operators of the need to back up parameters stored in volatile memory.

**Yokogawa** • www.yokogawa.com
TRULY INTEGRATED CONTROL AND INSTRUMENTATION ... ONLY FROM ABB

Only ABB delivers the extended automation functionality that gives you the visibility and control you need to run your plant more efficiently — optimizing your precious time, resources and money. Find out how truly integrated control and instrumentation can save you money ... get your FREE copy of our asset optimization white paper at: www.abb.com/systrumentation.

ABB • www.abb.com/systrumentation

EMERSON ANNOUNCES NEW OPTIONS FOR ROSEMOUNT® SINGLE-LEAD GUIDED WAVE RADAR (GWR) LEVEL TRANSMITTERS FOR CHALLENGING APPLICATIONS

Emerson Process Management has enhanced the single probe offering of the Rosemount® 5300 Series Guided Wave Radar (GWR). The new options include a thicker rod for longer measurement lengths and a Hastelloy C-276 probe and wetted parts for applications in corrosive, hot and high pressure environments. The new, thicker 13mm probe is designed for an extended measurement range and is available in stainless steel for standard operating temperatures and pressures. The new Hastelloy C-276 probe and wetted parts option make the transmitter ideal for use in corrosive, hot and high pressure environments.

EMERSON PROCESS MANAGEMENT • www.emersonprocess.com

HONEYWELL'S FIELD DEVICE MANAGER ADDS KEY CAPABILITIES

Now, for the first time, Honeywell's award-winning Field Device Manager (FDM) has added support for FOUNDATION fieldbus advanced diagnostics through FDT/DTM technology. FDM R410 has been enhanced to access devices connected to Experion R400 FIMs and to provide support for those devices through DTMs. This comes in addition to existing FDT/DTM support for HART, Profibus, and HART over Profibus. FDM features the ability to detect smart devices and automatically add them to its database. It uses information accessed from the actual, connected device to automatically assign the proper device template. This saves time by eliminating the need to build templates and assign them to devices. Users can now take full advantage of maintenance and advanced diagnostic features available only through DTMs for FOUNDATION fieldbus devices.

HONEYWELL • www.honeywell.com

MICROCYBER DEVELOPS MODBUS-TO-FOUNDATION FIELDBUS CONVERTERS

As one of the leading suppliers of premium industrial communication products (FOUNDATION fieldbus, Profibus PA, HART and Modbus), Microcyber has developed a converter for MODBUS to FOUNDATION fieldbus (NCS-MF105). It is able to integrate device/board with MODBUS communication interface to FOUNDATION bus system. As a MODBUS host, NCS-MF105 communicates with the device with MODBUS-RTU interface, and can achieve read/write operation for MODBUS register data via fieldbus transducer blocks, and convert MODBUS data to fieldbus communication system via standard AI, AO, DI, DO function blocks. Also, Microcyber provides OEM Board Solutions and Fieldbus Development Toolkits.

MICROCYBER • www.microcyber.cn/en/product.asp

REDUNDANT FOUNDATION FIELDBUS PHYSICAL LAYERS

One difficulty still remains with fieldbus technology: all segment communications and power integrity are vulnerable to a single broken, twisted wire pair. The MooreHawke TRUNKSAFE Fault-Tolerant Fieldbus System provides a cost-effective, yet highly reliable, strategy to maintain continuous communications between field devices and a host system in the event of any single point failure on a FOUNDATION fieldbus physical layer.

MOOREHAWKE • www.miinet.com/moorehawke
THE NEW MTL9370-FB — FIELDBUS BARRIERS, ONLY BETTER

MTL’s new range of Fieldbus Barrier wiring hubs establish a new benchmark for FOUNDATION fieldbus networks. The 9370-FB Series Fieldbus Barrier retains the major benefits of the “High Energy Trunk” technique while removing the drawbacks associated with existing implementations. Gone are inflexible, custom-built field enclosures and complex wiring looms. The result is lower cost, safer operation and higher reliability throughout the lifecycle of the fieldbus network, with benefits not only for the plant operator, but for all parties involved in the design and installation process.

- Live pluggable modules for safer maintenance
- Optional surge protection — even as a retro-fit
- Standard enclosures eliminate “customized” wiring
- Smaller footprint gives up to 70% space savings

MTL • www.mtl-fieldbus.com

PEPPERL+FUCHS INTRODUCES Newest Version of its Advanced Diagnostic Module DTM Software

Advanced Diagnostic Modules (ADM) monitor the quality of fieldbus communication for FOUNDATION fieldbus H1 and PROFIBUS PA networks, and Diagnostic Manager software includes a number of updates that dramatically speeds fieldbus commissioning and takes the guesswork out of troubleshooting for ADM users. The most significant improvement is a built-in expert system that automatically learns the communications behavior of a segment during commissioning, and over time is able to diagnose any situation on the basis of past experience. Additional updates of significance include: Automated tag reading to enable reading and documenting tags and device IDs in combination with any FOUNDATION fieldbus host, and an improved oscilloscope which offers more trigger events and automatically captures up to 10 shots in a row; each bit and telegram is identified with type and value, as well as source and destination address.

PEPPERL+FUCHS • www.fieldconnex.info

INSTRUMENT TECHNICIANS AND AUTOMATION ENGINEERS CAN BRING ASSET MANAGEMENT TO THE FIELD

The latest version of FactoryTalk AssetCentre enables instrument technicians and automation engineers to centrally-store configuration of isolated networks and/or smart process devices to improve diagnostic and troubleshooting capabilities. This field-enabled process device solution allows users to check out device files, edit the configuration data remotely while connected to the device, and check the file back in to create a new master device configuration file. This gives users the ability to customize their FOUNDATION Fieldbus device settings, perform realtime calibration and monitoring, and archive diagnostic and configuration information within the PlantPAx architecture. This can be used to improve technician productivity and process throughput while reducing risk. The solution is ideal for project commissioning when the automation system is not fully functional, as well as for OEM applications or projects that engage multiple control architectures.

ROCKWELL AUTOMATION • www.rockwellautomation.com

R. STAHL OFFERS SCALABLE PHYSICAL LAYER DIAGNOSTICS — TAILORED TO YOUR NEEDS

With the new scalable diagnostics concept, customers can choose exactly the level of diagnostics that they need — and are willing to pay for. Each Fieldbus Power Supply features integrated physical layer diagnostics of signal level, noise, jitter and unbalance. Perfect for installation or troubleshooting, the Fieldbus Power Supply can be connected to a PC via a front-side serial interface and all information is displayed on the screen without the need to install special drivers or DTMs. For pro-active alarming requirements, the Advanced Fieldbus Power Supply has adjustable warning levels, a relay contact and three LEDs to warn of any deterioration of the fieldbus quality. The brand new Diagnosis Communication Module reads the physical layer information from up to eight segments. Via an Enhanced DD system, integration is easy to achieve.

R. STAHL • www.stahl.de

NEW SITRANS LR560 IS THE FIRST 78 GHZ RADAR LEVEL TRANSMITTER FOR CONTINUOUS LEVEL MEASUREMENT OF SOLIDS

Siemens Industry Automation Division has launched Sitrans LR560, the first radar level transmitter operating at 78 GHz frequency. Sitrans LR560 is a non-contacting 2-wire FMCW (Frequency Modulated Continuous Wave) radar level measurement transmitter with a measurement range of 100 meters (328 ft). The transmitter emits a narrow four-degree beam which avoids silo wall obstructions and other installation interferences, allowing it to be installed practically anywhere on the top of the silo. As the first radar transmitter to operate at 78 GHz frequency, it emits a short wavelength to provide exceptional signal reflection even from solids with a steep angle of repose. The graphical Quick Start Wizard guides the user to get Sitrans LR560 operational in minutes for accurate and reliable level measurement readings without any additional fine-tuning. Sitrans LR560 is available with HART™, PROFIBUS PA, or FOUNDATION™ fieldbus protocol.

SIEMENS • www.siemens.com/sitranslr560

SMAR RELEASES SIMULATION VIEW FOR CONTROL STRATEGY SIMULATION

Smar presents the ultimate software that helps improve your business by analyzing the impact of new FOUNDATION fieldbus control strategies prior to live implementation by customers. All procedures can be done offline, without causing disruptions in service. Using its powerful features, technicians are able to develop and simulate strategies based on FOUNDATION fieldbus function blocks and ladder logic according to the IEC 61131-3 standard. The simulated data are available through SYSTEM302’s OPC™ server to any OPC™ client. Houston, TX – sales@smar.com – 1-800-762-7833.

SMAR • www.system302.com
Foundation Fieldbus – we put the pieces in place.

The right skills to optimize your projects.

It’s powerful and versatile, but getting the most from your FOUNDATION™ fieldbus architecture is a major challenge. At Endress+Hauser, we complement our wide product offering with top industry expertise and experience. This enables you to realize your project’s potential and achieve the return on investment you expect.

Independent of the DCS we offer solutions integration for condition monitoring, asset management and control in the field. We deliver improved plant performance and better business results and reduce hassle and risk. Nothing puzzling about that.

www.automation.endress.com/fieldbus
The Fieldbus Foundation is “Changing the Playing Field” in industrial automation. The scope of FOUNDATION™ technology makes it a process automation infrastructure—one of the most advanced and scalable solutions available.

This infrastructure is supplier-neutral and standards-based, providing end users with a common framework to implement and manage strategies for operational excellence and continuous improvement in process manufacturing.

Today, FOUNDATION fieldbus dominates the worldwide process automation market—and is a growing solution for the hybrid industries. It’s the “technology of choice” for both early adopters and new end users around the globe, especially in developing markets such as Asia-Pacific, Latin America and Eastern Europe.

Find out more.

Process Industry Fieldbus Market Share

- FOUNDATION fieldbus: 68.1%
- Profibus-PA: 31.7%
- Other Protocols: 0.2%