

# 10 reasons why you & your manager should attend ...



## **1. Alunorte Fieldbus Project for the largest alumina refinery in the world – implementation and lessons learnt - Hans Sjudahl –ABB (GOLD SPONSOR) ABB Asia Pacific Business Manager – Process Control Systems**

When two new production trains were commissioned in 2006, Alunorte became the largest alumina refinery in the world, increasing output from 2.5Mt/y to 4.4Mt/y. This project involved the installation and commissioning of a very large number of fieldbus devices. All device interfaces were completely integrated with the Automation System. Also libraries for communication - with 35 different device types from several suppliers - were developed and tested during the project phase in close cooperation between Alunorte, ABB and third party suppliers. The result was a significant enhancement in the solutions library and the fastest commissioning time ever experienced for this kind of plant.

The automation system has a total of 18 000 I/O points utilising Foundation Fieldbus, Profibus interfaces (including smart motor controllers) and redundant controllers.

Foundation Fieldbus High Speed Ethernet has been utilised for all instrumentation with Profibus DP implemented for motor control centre interfaces.

After five months of commissioning and 12 days of ramp-up operation (which is the lowest ramp-up time ever registered for this kind of industry) ALUNORTE has been operating at nominal load since April 2006.

This integration with intelligent devices provides a centralised amount of diagnostic information, opening up a wide range of possibilities in the Asset Optimisation area.

This technical paper details how the project was implemented and highlights lessons learnt during the various phases along with potential for the future.

## **2. Open-Architecture Physical Layer Diagnostics Speed Installation and Reduce Down-Time Presenter: Phil Saward, Product Manager, MTL Instruments, England**

Hand-held test tools have been used routinely on the world's major fieldbus installations to speed the installation process by diagnosing wiring errors prior to start-up. In response to end-user feedback, recent enhancements have delivered better features such as noise measurement in multiple frequency bands and the ability to store field measurements before downloading them in the maintenance shop. Now, with the advent of continuous, on-line monitoring of the fieldbus physical layer, diagnostic information can be integrated into the asset and alarm management environments of today's fieldbus control systems. The paper will describe how the use of Foundation fieldbus as the protocol for communicating diagnostic information delivers an open architecture that is independent of control system choice. The key benefits of physical layer diagnostics will be explained, such as the ability to detect deterioration of segment performance before it affects the process, and improved use of maintenance resources during commissioning, hand-over and long-term operation.

## **3. Digital Fieldbus Implementation For Mineral Processing - Manoj Pandya, Design Manager/Greg Daniels, Control Systems Leader - Gove Expansion Project Alcan Engineering**

A technological change is emerging in the process control and monitoring environment. The enormous economic benefits of the application of digital communication for instrumentation equipment are influencing decisions to abandon the conventional point-to-point technology, making the shift to digital technology imminent.

To date the large-scale use of digital technology has been limited to the petro-chemical sector; however, Alcan Inc has taken steps to keep abreast of this technological change as demonstrated by the introduction of FOUNDATION™ fieldbus and Profibus DP as part of the AUD2bn expansion of Alcan Gove's alumina refinery.

This paper discusses the implementation of digital communication technology for process control equipment from concept to commissioning. The primary focus of the paper is a technology plan developed by Alcan Engineering Pty Limited (ALCENG). The topics covered include migration to new technology and associated risk management, engineering design process and commissioning, as well as the benefits gained and “tips and traps” for a successful project implementation.

#### **4. Detailed Specification and Implementation of a Foundation Fieldbus Project – Phil Eastwood - Lead Instrument/Controls Engineer-Angel Gas Project**

This presentation is based on the experience of implementing a Foundation Fieldbus based control system for an offshore “Not Normally Manned” gas platform from the detailed design phase of the project through to fabrication site commissioning.

The project has been conducted based on the client’s project philosophy of developing a set of FF standards for the specification of field devices, host and integration of data to the upstream asset management system which may be universally applied to future projects. The following subject areas are covered;

- System Architecture and Control Philosophy
- Segment Risk Management
- Host PCS requirements
- Software configuration
- Field Device selection and Configuration Requirements
- FISCO specification and Certification
- 3rd Party Vendor Supplied Equipment
- FF Documentation Requirements
- Factory Inspection and Testing Requirements
- Installation and Site Integration Requirements

#### **5. Planning and Implementation of FF-SIS within the Process Industry - Gordon Stevenson - Control Systems EGS -Worsley Efficiency and Growth Project**

The approval of fieldbus for use on SIL 3 rated systems has opened the door to manufacturers, system designers and production companies to incorporate the many benefits of FF into the IEC 61511-1 safety lifecycle model. How to realise the benefits of FF and its impact on the specification, design, validation, verification and maintenance of an SIS are addressed. The risks associated with FF-SIS are examined and practical risk reduction/mitigation steps proposed.

#### **6. Maintaining the Functional Value an FF System Delivers - Craig Webb - Asset Effectiveness Consultant - Honeywell Process Solutions**

A component of the justification for the use of FF field devices has been the capability of those devices to provide comprehensive diagnostics. Delivering a useful result from these diagnostics has proven to require a structured approach to information collection, management and access. Raw device diagnostics must be processed to translate them into focussed, actionable outcomes that align to predefined maintenance actions and understood response urgencies. This has been show to benefit from the coupling of off-device assessments with on-device diagnostics to attain a functionally oriented assessment.

Application of FF devices in minimally manned and unmanned plant increases the reliance on FF dependability and the performance of diagnostic assessment. Performance of the device function must be sustained and rare failure events must be recognised and acted on quickly to prevent loss of function. Managed appropriately, diagnostics can greatly assist in the timely detection of the need for planned intervention.

An approach for the management of device diagnostics for a range of FF device types, including transmitters and valve positioners, is discussed as applied in the oil and gas industry in on-shore plants and off-shore processing facilities.

#### **7. Implementing Fieldbus Technology on the Ravensthorpe Nickel Project - Rob Winter- BHP /Dirk Pieterse – Senior Instrument Engineer RJV**

In March 2004 BHP Billiton approved the development of the Ravensthorpe Nickel Project. The production capacity design of the Plant is 45000 tons per annum. Fieldbus technologies have been implemented on the processing plant as follows;

- FOUNDATION Fieldbus was selected for Instruments and Valves including a significant number of digital signals;
- Profibus DP for Drives; and Modbus RTU for non critical serial data communications.

Key implementation objectives were to make effective use of fieldbus information in operating and maintenance strategies. This required integration of various systems, as well as adapting work practises.

By the time of the FFEUCA presentation a majority of the Fieldbus systems would have been commissioned. As of to date about 90 % of Instruments and valves have been delivered to Site. The testing and verification Contractor has tested 90 %. The E&I Contractors commenced with installation of the Instrumentation. The Lump Sum Key Contractors (LSTKs) implemented FOUNDATION Fieldbus as well and commenced with pre-commissioning activities.

The RJV presentation will cover a brief overview of the Process, implementation design criteria, Engineering and diagnostic tools utilised, pre-commissioning philosophy and lessons learnt – what to do different on the next major FF Project.

### **8 A Truly Redundant Wiring Technology for FF H1 Segments - Mike O'Neill -Director, Fieldbus System- MooreHawke Fieldbus, UK**

Foundation Fieldbus is becoming the 'de facto' standard for modern process control systems, allowing advanced field diagnostics and sophisticated plant communications networks to be easily implemented via relatively simple bus-powered wiring technology. One of the restricting factors in the uptake of this technology is that the physical layer technology used does not naturally allow for redundancy. Power supplies (conditioners) and systems interface packages (H1 cards) can be duplicated as redundant pairs, but all device communications are dependent upon the performance and integrity of a single twisted-pair cable.

This paper introduces a completely new and secure solution for fieldbus segment cabling with no changes required in the design and operation of field devices, making this the final piece necessary to make 'control in the field' truly acceptable. The paper describes the technology used to make the physical layer redundant and demonstrates its performance in an industrial application, with particular emphasis of the overall MTTF achieved.

Finally, the paper describes the impact of such a redundant wiring system on the choices for hazardous area protection technology, with a prediction that intrinsic safety as a technique will be completely overshadowed by a return to non-incendive and flameproof solutions.

### **9. Foundation Fieldbus Future Technical Directions - Bill Tatum – Fieldbus Foundation - Austin Texas**

This paper describes new developments underway at FF including:

- Device Description (DD) Extensions to IEC 61804-2
- Safety Instrumented Systems (SIS)
- Information Integration ... HSE, & OPC DX
- Electronic Device Description Language

### **10. FF Questions and Answers Session**

This session will give the delegates an opportunity to ask questions and get answers from the FF technical "experts".

**Please feel free to place a printed copy of these brochures on your notice board**