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DCS Offerings
System 800xA, Freelance are current offerings. Prior generation systems include Symphony (Harmony and Melody); INFI 90; Conronic; Master; MOD 300; Freelance 2000; SattLine; DCI System Six.

DCS Business
In ABB’s view, the primary market drivers behind the implementation of automation today are increased productivity and flexibility, reduced lifecycle costs, safe-guarding investments, energy efficiency and environmental and safety management. These are also the primary drivers behind the System 800xA architecture.

A powerful object-oriented technology, called Aspect Objects resides at the core of System 800xA. Put simply, Aspect Objects allows users to view any aspect of the automation scheme, from a pump or a valve to a process unit or pressure transmitter, as a software object. Each object in the system has a number of attached aspects that can range from integration to computerized maintenance management systems (CMMS) and enterprise asset management (EAM) systems to schematic drawings and trending information. Aspect Objects provides the key real-time linkage between equipment and applications.

System 800xA provides these functions with a single window environment for context-sensitive information access and navigation, and builds on a common environment for engineering, operations, information management, and asset optimization. System 800xA also provides a common operator environment for ABB’s entire portfolio of safety and process control systems, providing access to information across the enterprise as well as context-sensitive decision and action tools that allow the right users access to the right information at the right time from any point within the system.

A key strength of System 800xA is its ability to extend its reach beyond the traditional functions of the DCS to include functions such as collaborative production management, safety and critical control, advanced control, information management, smart instrumentation, smart drives and motor control centers, asset management, enterprise connectivity and documenta-
tion management capabilities. System 800xA was built from the ground up as an integration platform and its architecture, together with the Aspect Object technology, provides the foundation for integrating ABB and third-party hardware and software.

In early 2009, ABB released the Industrial IT Extended Automation System 800xA with SIL3 integrated safety. This release completed ABB’s portfolio of SIL-certified safety systems and provided a diverse architecture that supports both dual and quad configurations.

**IEC 61850 Module**

In addition to SIL3, ABB also released its IEC61850 communication module supporting the IEC61850 standard for communications with medium and high voltage switchgear and protection equipment. This enables ABB to deliver a seamlessly integrated automation and electrical solutions providing interoperability between IEDs (intelligent electrical devices) and thus reducing operational and engineering costs. Today, ABB can integrate the process control, process electrification, and power distribution and management portions of a plant with System 800xA, so information is available to all areas. The IEC61850 standard is a key component of their strategy. This strategy is particularly interesting to industries that are heavy electrical users such as oil & gas, utilities, pulp & paper, and metals. These industries view electricity as a raw material. The company now has many
projects under way for integrated process and power automation, and the approach continues to gain traction.

**800xA Release 5.1**

ABB’s latest release of System 800xA came out at the end of the first half of 2010, and ABB currently claims over 6,000 800xA installations. ABB’s 800xA Version 5.1 includes major enhancements in alarm management and situation awareness, engineering, management of change, system maintenance and diagnostic features, several improvements in the control system hardware, and better connectivity to wider variety of networks, including wireless and IEC 61850.

Version 5.1 is a Windows 7-based release. The system is well suited for very large applications, but the latest version expands the size capabilities even further, with the base system being able to accommodate 120,000 objects. The new version also supports larger applications and makes it easier to integrate multiple systems together.

**Diagnostics, Security, and Virtualization Features**

Version 5.1 includes a documented procedure for node backup and recovery using Acronis True Image. There is a new overall system administration interface for security and overall system management. This includes a new security update tool, diagnostics collection tool, and system checker. All of this makes it easier to keep up with Microsoft security patches and other IT infrastructure management issues.

Support of virtualization for all 800xA servers was first released in June of 2009. Version 5.1 offers support of virtualization for VMware VSphere 4 ESX/ESXi. Virtualization is heavily emphasized in the new release and can cut down on the number of PCs required for installation by as much as 75 percent.

**Fieldbus, Wireless, and Network Connectivity**

ABB has long been a supporter of both Foundation Fieldbus and Profibus for process and discrete automation. Version 5.1 of 800xA features a High Speed Ethernet (HSE) solution for Foundation Fieldbus that has greatly reduced infrastructure requirements, allowing for a fourfold increase in the number of devices that can be connected to one node.

Support of DeviceNet through Ethernet IP is also part of the new release as is support of WirelessHART. ABB has an alliance with Pepperl+Fuchs to provide that company’s WirelessHART gateway. For IEC 61850 integr-
tion, ABB has increased the number of devices supported from 50 to 80, with 160 intelligent electrical devices (IEDs) per OPC server instance.

**Alarm Management and Situation Awareness**

Alarm management and overall situation awareness continue to be a primary concern for end users and ABB has made several advancements in this area for 800xA. Alarm management enhancements include alarm suppression, alarm shelving, and built in alarm analysis techniques. The new alarm analysis list is all inclusive of the ISA 18.02 standard. Built in alarm and analysis displays are natively accessible by operators through the Windows Presentation Foundation (WPF).

Along with the additional alarm management capabilities, version 5.1 allows operators in different areas of a facility to take control of a plant area or unit from the currently responsible operator. Once the action is approved, permission to operate that area or unit of the plant is transferred to the new operator and it is captured in the audit trail log. All area or unit alarm and event messages are then routed to the new operator. This “point of control” capability improves coordination of operators during critical periods of plant operation such as shift changes, and improves safety and security in the process.

**Engineering and Configuration**

On the engineering and configuration side, ABB has made several enhancements to the Function Designer, Foundation Fieldbus engineering functions, and change management. Version 5.1 features a detailed difference report that can compare pre change to post change configuration to determine what has changed. The multi user support for Foundation Fieldbus means that multiple users can commission multiple H1 segments faster. Foundation Fieldbus bulk data management capabilities are also part of the new release, offering the same bulk data handling capabilities as the rest of the 800xA system.

A Task Analysis Tool lets users evaluate how applications will be executed based on the current task rates assigned before they download the application. Latency or conflicts are easily identified and download of the application can be prevented if an error seems imminent. The Task Analysis Tool also performs “what if” scenarios. The Detailed Difference Report allows users to see changes made to control applications and graphics and generates a report on what has been modified, added, or removed.
Base Hardware Improvements
ABB has also made some key improvements so System 800xA control hardware. Improvements have been made in controller to controller communication. A new high performance PM 891 controller is available that offers more applications per controller. PM 891 has three times the clock speed at 450 MHz and 4 times the memory.

Integrated Applications
In addition to ABB’s new System 800xA features, several integrated applications have been certified over the past few years. These applications include ABB’s own Enterprise Connectivity solution, Intergraph’s Smart Plant Instrumentation and ABB’s 800xA Evolution for Honeywell System Migration (HSM).

The Enterprise Connectivity solution (ECS) provides a streamlined, single point interface for vertical integration that is suitable for enterprises of all levels of complexity. ECS provides a unified framework for dealing with transactional and event-driven systems in a common environment. It provides a single, highly flexible and configurable interface, which results in a higher degree of reliable information flowing between manufacturing and business systems and lower engineering and interface maintenance costs.

The Intergraph Smart Plant Instrumentation (SPI) integration with System 800xA provides automatic configuration of the control system; updates to the control system during design changes; documentation of control system configuration; consistent as-built documentation during plant handover; and improved decision-making during critical maintenance and operations events. The bi-directional synchronization between SPI and 800xA enables efficient engineering and maintenance through the entire lifecycle of the control system.

The 800xA Evolution for HSM connectivity package enables supervision and operation of objects from a Honeywell TDC3000 from System 800xA. It provides integrated alarm and events, standard 800xA graphical elements and browsable OPC items. The single-window environment of 800xA provides visibility for all control data (from 800xA and TDC3000) to the operator to ensure that the right information is provided in the right context to support accurate decisions and actions.

Load-Evaluate-Go as a Path to High Availability Control
The Load-Evaluate-Go feature sprang from ABB’s relationship with Dow and is a key requirement for Dow applications. Load-Evaluate-Go enables users to modify, download, and evaluate a “revised” application without interfering with the running or “current” application. The “revised” application can then be put on line, further modified, or discarded. Load-Evaluate-Go provides many end user benefits in the area of reducing risk. Aside from reducing the overall risk of unplanned downtime, Load-Evaluate-Go reduces the risk of applying erroneous application changes to the process during application changes in running processes.

System 800xA supports on-line version upgrades. With System 800xA AC800M controllers in a redundant configuration, online upgrades of the controller’s firmware is accomplished by loading the new firmware into the backup controller, evaluating various parameters, and then switching it to be the primary controller. The second, now the backup controller, will then have its firmware upgraded and redundancy will be re-established. This is particularly important in the chemical industry, where process plants often have many process streams plus a “common” for process services that never shuts down to facilitate such upgrades.

**Freelance System**

ABB recently released the latest version of its Freelance hybrid process control system, which includes new direct and remote input/outputs (I/Os) for even more communication with field devices, as well as a new bulk data management system to streamline engineering time, effort and cost. The new release also adds to the system’s PROFIBUS connectivity and includes OPC interfaces that provide expanded access to system information, including alarms and events.

ABB’s Freelance control system provides a footprint and price more typical of a PLC system with the functionality of a DCS. It is ideal for smaller applications, or applications that will expand over time. The integrated environment facilitates engineering, commissioning, maintenance and fieldbus management. The intuitive operator interface enables easy operation and diagnostics of the entire system and it allows the integration of all
common fieldbuses, leaving the user to select any they wish - whether FOUNDATION Fieldbus, PROFIBUS, or HART.

**Partnerships and Acquisitions**
ABB recently made news in the oil & gas world when it signed an agreement to acquire the business of Ber-Mac Electrical and Instrumentation Ltd. of Calgary, Canada. Ber-Mac specializes in industrial automation, electrical, instrumentation design, process optimization, panel fabrication, and field services. It is particularly strong in the oil & gas industry. Established in 1980, the company has enjoyed steady growth in recent years and earned revenues of ca. $100 million in 2007.

In October of 2009, ABB also purchased another Canadian systems integrator called Sinai Engineering. Sinai Engineering is a consulting firm whose customers include electric utilities, conventional and heavy oil, gas processing, pulp and paper, mining, pipeline operators, and, independent power producers. It employs about 30 employees.

ABB's strong position in both drives and in many of the world's most energy-intensive process industries, place it in a good position to take advantage of the energy efficiency revolution. The company's recent acquisition of Ventyx for over $1 billion (over four times revenues), enables ABB to provide a suite of software that provides the glue that allows ABB to track the flow of electrons from the point of generation to the point of use.

**Key Industries**
ABB is a leader in many of the traditional heavy process industries, including upstream oil and gas, metals and mining, cement, pulp and paper, and power generation. Although the company has not particularly been a leader in DCS sales to the refining industry, ABB recently won a major contract with Petrobras to provide process automation systems to 10 of the company’s refineries in Brazil.