1) Siemens TIA drastically simplifies a complex Batch Processing System

DMC was tasked with converting and streamlining a machine that was using an AB PLC and various software packages - replacing them with a S7 PLC and Comfort Panel. The system originally required a PLC, Full PC, SCADA HMI, Data Historian, Batching Control Software, Microsoft SQL Database, and many custom interface screens. DMC was able to drastically simplify the system (while maintaining all of the required functionality) using a Siemens PLC and HMI Comfort Panel and the TIA portal platform. Find out how we did it and learn some of the interesting tricks we employed to fully leverage the power of the S7 platform in order to accomplish this remarkable task.

2) Wireless Networks and Machine Safety: Lessons Learned in a Unique Environment

Today's automation systems offer wide flexibility; both within industrial applications as well as non-industrial ones. Wireless and safety designs usually implemented in the industrial space can follow similar design principles even in a non-industrial application, providing maximum benefits in terms of reliable operation and safety, even when faced with unique challenges. The Smithsonian National Zoological Park decided to renovate its Elephant House, home to its Asian elephants, and transform it into the Elephant Community Center. Wireless and safety technologies were employed to control a multitude of gates and doors that provide access, control, and safety; for both zookeepers and the elephants. Challenges faced included complex issues like a heavily-metallic environment, hydraulic access door control, and potential interference from consumer electronics. This presentation will help you discover the gains that can be achieved through implementing wireless and safety systems, either separately or combined, including improving safety, maximizing wireless coverage, and impacting your company's bottom line through improving productivity.

3) Turning Water Pipelines into Renewable Energy Generators

Lucid Energy, Inc. is a renewable energy technology company that has developed the LucidPipe Power System, a patented in-conduit (or in-pipe) hydropower technology that enables water-intensive industrial, municipal and agricultural users to produce carbon-free, base-load, low-cost electricity from their water pipelines and effluent streams. LucidPipe efficiently recaptures energy embedded in fast-flowing water inside of large-diameter, gravity-fed pipelines without disrupting pipeline operations and with no environmental impact.

The LucidPipe spherical turbines fit inside of large diameter (30”-96”) steel water transmission pipe and spin as water passes through them. The system produces consistent, environmentally-friendly and non-weather-dependent renewable energy that can be used to power equipment on-site (even in off-the-grid locations) or the electricity can be fed back to the grid to reduce energy costs or develop new revenue streams through Power Purchase Agreements with local utilities.

Using the Sinamics Motion to Grid (M2G) system from Siemens for the 42” pipe design, Lucid found the optimal solution for system efficiency and quality of energy. Utilizing this solution streamlines the communication and essentially eliminates integration issues. Being a startup company that specializes in turbine design and manufacturing, this partnership allows Lucid to focus on their specialty while still providing a complete system to the customer. This paper will discuss this unique renewable energy technology and the functionality benefits of utilizing Siemens as single supplier for an entire M2G system, including generators.
4) Applying Distributed Architectures in Automotive Powertrain Manufacturing

Automotive manufacturers need highly flexible and modular assembly systems to quickly accommodate changes in product variants and consumer demand. Powertrain assembly systems originally designed for 300,000 units/year may need to change for the following model year’s increase in demand of two to three times that amount. Accordingly, the controls architectures that run these systems must be modular, safe, easily and quickly designed and installed, with extensive diagnostics that keep MTTR at a minimum. We prefer to use Siemens TIA hardware because no other industrial automation supplier has the breadth of product and innovation to support the systems we manufacture. Siemens helps us deliver value to our customers by reducing design, installation, commissioning, and troubleshooting times while increasing modularity, safety, energy efficiency, and diagnostics. Siemens provides a distributed architecture configured to communicate via the Profinet and Profisafe industrial networks. These systems included Simatic S7-317F failsafe programmable controllers, ET 200pro distributed I/O, MP 377 Multi Panel HMIs, RFID read/write systems, RF170C RFID for automatic and manual stations, RF180C RFID high-speed communication modules for Profinet, and Scalance X208 managed Ethernet switches. Siemens also provides disconnect switches, motor starters, and Sinamics drives. Almost all of these components have an IP65 rating, which means they can be mounted on the machine where they are needed. If the customer needs to make changes to accommodate workflow or increase capacity, the automation components can be easily moved or added as everything easily disconnects, moves and reconnects including power, controls, communication and safety components. This hardware combined with the powerful engineering software and global support help us deliver world-class powertrain manufacturing systems on-time and under budget.

5) Energy Savings and Third-Party Control Compatibility with SINAMICS Drives S120 Active Front End

Corporate standards often dictate a hardware vendor without regard for the best technical or cost-effective solution. A thorough understanding of both the customer's needs and available technology can open the door to a superior solution with added benefits. This case study will tell how a paper converting plant upgraded an aging machine with a modern control system that featured a Siemens active front end (AFE). Beyond the typical retrofit of obsolete hardware, the AFE solution reduced energy consumption and eliminated dynamic braking hardware that is problematic in this application. The key to the solution was a pair of Siemens S120 AFEs, controlled by a customer-specified, third-party PLC, via Ethernet IP, powering over two dozen coordinated drives on a regenerative common DC bus.

6) Alliance Customer's Implementation of PCS7 V7.1 and V8.0 Standard Library using APL

Dow Corning, a Siemens Alliance customer, has standardized globally on PCS 7 for continuous, batch and discrete control applications. A key component of the roll-out of PCS7 is the global use of a standard Dow Corning library, which has been created based on APL blocks. This presentation will cover our approach to the creation and maintenance of the library including the migration to PCS7 V8.0 and beyond. We will review lessons learned from completed projects and see how feedback is incorporated into future version of the standard library. We will examine custom blocks and templates that have been developed for batch control (S-88), continuous sequential control (S-106, state based) and process shutdown/interlock logic. And finally we will explore functionality implemented in templates which is currently not part of the APL blocks for consideration as future PCS 7 product enhancements.
TransCanada Keystone Pipeline is 2,150 miles long with multiple pump stations a final design capacity of 590,000 barrels per day. Siemens was contracted to equip 35 stations with medium voltage motors, switchgear, contactors, soft starters (SS), variable frequency drives (VFD), pumps and automation control systems. This paper discusses the challenges and solutions for the initial and various lifetime configurations of the pumping automation system. The automation system architecture included:

- Hardware/software upgradable for up to 5 pumps per station
- Motors controlled by VFD, SS or both
- Alarm/trip thresholds individually configurable
- Existence of static VAR compensation and power factor correction and Power failure recovery.
- The pipeline required future changes to control schemes and SIMATIC S7 platform and PLC software once pipeline operation commenced.

Additional challenges included:

- Training and maintaining field service and system upgrade personnel over the deployment and operations phases
- Risks associated with future modifications
- Enabling future modifications without complete factory acceptance testing
- Version control of individual software routines, complete builds and field installed versions
- Maintenance and version unique PLC programs for each station.

The solutions developed together with TransCanada and implemented on the TCPL Cushing Extension are planned for the proposed TransCanada Keystone XL Pipeline to create one of the world's longest and safest pipelines.

8) PCS 7 Innovative Features Review

The presentation will provide tips and tricks of the PCS 7 innovative architectures including PCS 7 V8 SP 1 new features. We will focus on scenarios related to scalable solutions including the use cases for ET200 IO and smart electrical devices on Profinet DP today and discuss the tips and tricks for PCS 7 Profinet IO. We will discuss the use case for the PCS 7 Box and AS41x controllers today and discuss the use cases of the new PCS 7 ASmEC and AS410 controller series. We will compare the traditional control system network architectures to using the new teaming strategy and the new "flat" System and Terminalbus networks. You will learn when, why and how you can apply these new features.

9) The Integrated Control & Safety System for FPSOs: An Overview

Abstract: The Integrated Control and Safety System (ICSS) is at the center of the action on board SBM Offshore's fleet of Floating Production, Storage and Offloading vessels (FPSOs). At the heart of this system is Siemens PCS 7. Some of the key elements of the system are: the process control system (PCS), the process safety system (PSS), the Fire & Gas System (FGS), and the Human Machine Interface (HMI). The ICSS interacts with many key packages and systems that are critical to the proper and safe operation of the offshore facility. One challenge that SBM has faced with package interfaces is load balancing on older digital output modules. In some cases, this caused unplanned shutdowns, commissioning delays, and errors or failures reported in the diagnostics. An interim solution was implemented by fitting
interposing relays or parallel resistors on the lowest loads to achieve the required balance. The new F-DO modules from Siemens eliminate this issue. Some of the lessons learned are:

- Only certified safety relays should be used for shutdown commands
- Relays selected should have the proper resistances
- Parallel resistors should only be used as a last resort.

SBM Offshore is a leader in floating production and mooring systems, in production operations and in terminals and services. We supply floating production solutions through the entire product lifecycle, from engineering to procurement, construction, installation, operation and relocation.