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## CORPORATE BACKGROUNDER

### Overview

Cascade Solutions has offered customers expertise in integrated process and automation engineering from a broad spectrum of industries for over 20 years.

Key to its corporate philosophy is the recognition that the control, operability, and long term success of a manufacturing facility begins with the process design. This philosophy is key to all of its work – from conceptual process design through field commissioning and validation.

Success in the design and implementation of today's data intensive manufacturing facilities requires a wider range of expertise than in the past. Cascade addresses this challenge head-on with a staff of:

- **Process engineers** knowledgeable in control system implementation
- **Controls engineers** well versed in information technology
- A team of **software development engineers** familiar with the manufacturing environment

Cascade's holistic approach – linking the process to its control, the control to the data, and the data to the operation of the plant – affords its customers **optimal solutions and services**.

The staff is made up of committed, profit-sharing employees located in the Chicago area. Its knowledge of what works and what does not work in a manufacturing environment is the most valuable component of Cascade's intellectual property.

### Target Markets

Cascade's most recent projects have been in the life science industry, including pharmaceutical and biotechnology, but it maintains a strong presence in the chemical processing industry as well as the steel and food ingredients industries.

### Market Overview

While process equipment and instrumentation on plant floors have experienced significant changes over the last two decades, software components have undergone an even larger evolution.

Automation has evolved from a simple black-and-white trade to a highly integrated technology in the 21st century, inextricably tied into a business' overall information infrastructure. This evolution requires a collaboration of information systems, development, manufacturing, quality, engineering and executive management.

### **A Proven Solutions Approach**

At Cascade Solutions, its staff's breadth of knowledge in process automation has resulted in the successful execution of hundreds of projects, including:

- Batch automation for entire manufacturing facilities
- Process skid system automation using our **BatchEM™** solution
- Continuous process automation
- Electronic batch records with e-signatures
- Data management and data warehousing for MES
- Process data historian implementation and event archiving
- The **largest DeltaV installation** for the biotechnology industry in the U.S. – a commercial cell culture facility in Rhode Island

### **Industry Standards and Regulatory Guidelines**

The engineering professionals at Cascade Solutions are well versed in the various guidelines and regulations that impact the process industries. Cascade's expertise helps companies produce high-quality products in compliance while using technology and integration to the highest degree possible, ensuring that projects for FDA regulated commercial manufacturing facilities are completed accurately, on time, and within budget.

### **Process Engineering and Consulting**

Cascade Solutions offers full-service process engineering and consulting services because the process itself is central to any manufacturing solution. Its expertise in the biotechnology and pharmaceutical industries includes experience in both engineering and manufacturing management in these highly regulated environments.

Having come directly from today's life science industries, Cascade's engineers have the knowledge to incorporate process designs from their hands-on experience. That experience includes:

- Bioreactors and fermentation systems
- Spray dryers, reactors, filter dryers, batch distillation, bulk synthesis
- Centrifugation, homogenization and recovery
- Chromatography, UF/DF and purification operations
- Lyophilization
- Clean in place (CIP) systems, steam in place (SIP) and high purity water

## Complete Project Support

Cascade offers engineering design for process skid, process suite or for an entire manufacturing facility. Coupled with its engineer's automation skill set, Cascade is unique in its ability to deliver complete systems – from design, procurement, automation, through commissioning and validation.

For clients that have manufacturing facilities with more projects than available personnel, Cascade frequently serves as part of the solution right on the plant floor, providing on-site assistance with production support, process optimization, engineering project management and equipment procurement.

## Proprietary Technology

Leveraging its experience designing and implementing key projects ranging in the tens of thousands of I/O points, Cascade has developed its own internal technology tools. These include:

### **Project Studio™**

This software program expedites delivery of projects by establishing project development consistency and project checkout and testing. It generates the required validation and/or test documents to qualify the system. Project Studio™ provides the ability to manage complex, system wide changes, such as I/O or control module-level changes, with little to no impact on the project schedule or budget.

### **BatchEM™**

This innovative engineering approach addresses the problem of out-of-date or complete lack of OEM skid management software automation technology in the industry. It breaks down the typical supplied fixed sequences for operating the equipment into small, stand-alone modules, which can be operated independently or easily combined to create an infinite number of recipes.

## Benefits of Working with Cascade

Companies working with the Cascade Solutions team experience numerous benefits:

**Reduced risk** – Particularly in the biotech/pharma markets, companies have spent a significant amount on R&D and don't wish to waste excessive time or money on the automation, commissioning, or manufacturing phases.

**Well thought-out data management process that aids validation and compliance** – The expertise with FDA, EPA, and government regulations enables Cascade to manage the data for clients so that they can deliver any kind of report and documentation needed.

**Expertise in the complexity of details tied to industry standards** – Cascade's engineers design systems in line with the latest standards so that future enhancements can be easily accommodated.

**Experience of engineers who have completed multiple projects** – Experienced engineers ensure the project will be completed correctly the first time, saving money and getting the product to market faster.

**Investment in technology** – Working with Cascade enables companies to leverage the best and smartest of today's technology.

### Professional Engineering Services

Cascade Solutions is a full-service engineering firm, available for all phases of customers' projects – from conceptual process design, through commissioning and startup, to the optimization of existing facilities. It offers its clients the ease, consistency and economy of one-source project management, with expertise and experience in all of the following services:

- Automation engineering
- Process engineering
- Engineering project management
- Data management
- IT services instrument and electrical design
- Control system design and implementation
- Startup and commissioning
- Validation
- Custom applications
- OEM & supplier management
- Long-term support contracts

### The Cascade Approach

Cascade Solutions has developed a phased approach to its management of quality projects that ensures consistency and eliminates the scope-creep that often occurs with capital projects.

In the **discovery phase**, Cascade Solutions engineers work closely with the customer to identify any and all business goals. Needs are identified and quantified, providing the foundation and direction (vision) for process, process automation, data management, and IT needs.

During the **strategy phase**, as ideas and goals mature into specific projects, Cascade Solutions delivers strategic offerings, including project definition, gap analysis, future state architecture, feasibility studies, and user requirements. The company also consults on selection and evaluation of service firms.

**The design, implementation and verification phase incorporates Cascade's Project Studio™** to streamline delivery while developing functional specifications, detailed designs, instrument specification, process and instrumentation diagrams, full range component and system testing and simulation.

During the final stage of **deploy and maintain**, Cascade Solutions provides complete commissioning and startup services, including such activities as loop checking and tuning, full system checkout, electrical and automation trouble-shooting, on-site recipe development, mock process runs, field simulation and validation protocol execution.

### **Domain Expertise**

Cascade Solutions' employees have extensive background in process, electrical, and automation services and platforms including a variety of distributed control and PLC platforms ranging from Rosemount System 3, to Fisher Provox, Delta V, Honeywell, Yokogawa, Allen-Bradley, Siemens, Omron, Modicon, GE, Texas Instruments, Bristol Babcock, and Micon.

Unlike in-house engineers, who may only work on 1-2 projects each year, Cascade Solutions' engineers enjoy the benefit of multiple exposure and experience with a variety of technologies required in today's IT-focused businesses. Whether it's OPC, SQL Server DeviceNet, Profibus, Foundation Fieldbus, HTML, XML, XSLT, .NET or an ASP model, the Cascade Solutions team has the technology experience.

### **Customers**

Their life science customers have included Abbott Laboratories, Allergan, Amgen, Baxter, Bristol-Myers Squibb, Biogen Idec, Genentech, and Pfizer. Their chemical processing customers include Corn Products, DSM, Flint Hills Resources, Koppers, GreatPoint Energy, Mead Johnson Nutritionals, Praxair, Rhodia, Rohm & Haas, Sun Chemical, and Uniqema. The company continually looks for new challenges and opportunities to provide services on the information side of the business, for a truly integrated process, automation and IT capability.

### **Company History**

The company's roots go back to a sole proprietorship founded by President John Sever in 1993 as Alpha Associates in Chicago, Illinois. As a chemical process engineer, Sever had worked in several plant environments and developed expertise in a variety of markets, including pulp and paper, bulk food grade oil, coatings, and other chemical applications.

Originally the company focused on instrumentation and solutions, and has expanded over the years from that starting point. In 1994 Dan Katzinski joined John Sever and the company was renamed Cascade Controls. In its 20+ years, the company has continually added experienced, degreed engineers and now employs a wide variety of experts.

The majority of the company's work today is in automation, which is characterized by innovative approaches and a focus on implementing new capital projects.

In August 2008, the company was renamed Cascade Solutions, to better emphasize its focus on offering clients complete process and automation solutions.

### **Future Direction**

The company will continue its original focus on automation services to include developing services and point solutions in the complementary area of process engineering. Cascade will continue to seek new challenges and opportunities to provide services on the information side of the business, for a truly integrated process, automation and IT capability.

### **Management**

John Sever – Co-Founder and President  
W. Dan Katzinski – Co-Founder and Vice President

### **Information**

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