APICS
The Association for Operations Management

Calgary Chapter Newsletter

December 2005

Winter Course Offering

Inside this issue:

Education Update

With the holiday season upon us, it is a time to reflect and a time to look forward.

This fall, APICS Calgary held two CPIM preparation courses – Basics of Supply Chain Management, and Detailed Scheduling & Planning. I would like to congratulate the students and thank the instructors (Karen Matile and Mark Teeple) for yet another successful term of APICS education.

Looking forward, we will be offering three courses for the winter term, including an "accelerated" offering of our "Fundamentals of Inventory Control" where this introductory course that normally requires 10-12 week night sessions can be completed in four Saturday sessions in March. We hope this new course time will provide increased flexibility for potential students and/or corporations who would like to have some of their staff upgrade their inventory control skills. Please see the "education offerings" section for the details of this winter's scheduled courses which are currently accepting registration.

Just a reminder, APICS Calgary courses are offered in two streams:

- **CPIM prep courses:** for individuals pursuing their designation
- **Fundamental courses:** for companies and individuals that are interested in upgrading their inventory and production planning skills. These courses can be tailored for individual companies and can be delivered on-site (assuming sufficient registration).

Feel free to contact me if you have any questions or comments about APICS Calgary education.

Brent Snider, VP Education

Proposed Winter Course Offering:

#	Course	Timing
1	**Master Planning of Resources**	Tuesdays, January 17th to March 28th (skip March 14th) 5:30 pm - 8:30 pm (10 classes)
2	**Basics of Supply Chain Management**	Thursdays, January 19th to March 23rd 5:30 pm - 8:30 pm (10 classes)
3	**Fundamentals of Inventory Control**	Saturdays, March 4th to March 25th 9:00 am - 5:00 pm (4 classes)

APICS The Association for Operations Management is the global leader and premier source of the body of knowledge in operations management, including production, inventory, supply chain, materials management, purchasing, and logistics. Since 1957, individuals and companies have relied on APICS for its superior training, internationally recognized certifications, comprehensive resources, and worldwide network of accomplished industry professionals. To learn more about the APICS community, visit www.apics.org.

Membership Fact Sheet

APICS is the global leader and premier source of the body of knowledge in operations management, including production, inventory, supply chain, materials management, purchasing, and logistics. Since 1957, individuals and companies have relied on APICS for its superior training, internationally recognized certifications, comprehensive resources, and worldwide network of accomplished industry professionals.

The APICS membership community of 270 local APICS chapters and 33 International Associates supports nearly 60,000 members in 20,000 manufacturing and service industry companies worldwide. By joining APICS, professionals keep up-to-date on industry best practices, new technologies, and techniques and gain access to exclusive members-only resources, networking, and cost savings on educational materials. Employers who endorse APICS membership for their employees create a more capable, knowledgeable, and productive workforce.

Membership in the APICS community provides

- Unmatched education and training to improve job performance, achieve career success, and contribute to bottom-line profitability
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- Award-winning publications and resources to gain a competitive advantage through industry knowledge
- An international APICS community to draw on the expertise of professionals in the field of operations management
- Local chapter networks that provide opportunities to develop leadership skills through APICS chapter participation.

Membership Fees

Student	$ 25.00 (US)
Professional	$175.00 (US)
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Retired	$ 55.00 (US)
International Member-at-Large (Professional)	$195.00 (US)
International Member-at-Large (Group-Site)	$875.00 (US)

APICS-CALGARY Chapter Newsletter

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APICS-CALGARY Chapter
P.O. Box 73176
206, 2525 Woodview Dr. SW
Calgary, AB T2W 6E4
(403) 281-3170

This newsletter is the official publication of the Calgary Chapter of Region VIII APICS. It keeps members informed on topics of professional interest, upcoming programs, courses, seminars, meeting details, educational and career opportunities, and professional certification.

Submissions

Articles should be typed or word-processed in Microsoft Word format. Send articles to Kevin Falenda. See directory on page 8 for phone/fax numbers and e-mail addresses.

Classified Advertising Rates

	Member	Non-Member
Full Page	$250.00	$400.00
Insert	$500.00	$750.00
1/2 Page	$125.00	$200.00
1/4 Page	$ 75.00	$100.00
Business Card	$ 25.00	$ 35.00

For non-camera ready ads, and for revisions to ads, a layout charge of $25 per hour applies.

Regular advertisers receive discounts. Please call VP Marketing (see directory on page 8).

Editorial Policies

Suitability for publication is at the Editor's discretion within the guidelines established by the Chapter Executive. The Editor reserves the right to edit copy for length. Articles may not be reprinted without written permission from the Editor or Chapter Executive.

President's Report

As we begin to wind down 2005 in preparation for the upcoming holiday season, I would like to thank the membership for the continued support of our Chapter as well as all the non-member individuals and organizations who have helped the Chapter by hosting tours, professional development meetings, and enrolling personnel into the various education offerings that we provide.

Of course, none of this could happen without the assistance and dedication that our Board of Directors provide by volunteering their time and resources to schedule and manage the events and education offerings. A heartfelt thank you to all of you and your corporations who equally support you and our Chapter in your roles.

Before you all break for your holidays, I would like to provide you with a quick review/update on the efforts of your local APICS Chapter over the year. As most of you are aware, the roll-out of the new brand of APICS (i.e. logo, acronym change, etc.) is more or less complete across Canada. In the months to come, you will continue to see more and more changes from the Chapters in Region 8 (Canada) to continue towards the alignment with APICS HQ.

Part of the new APICS strategy also includes a more formalized Chapter management system whereas each Chapter was to set annual goals or targets in the various areas of the Chapter and review these on an on-going basis. For our Chapter, we set the following goals:

- Increase the membership by 10% (currently at 12%)
- A minimum of eight (8) events such as tours, professional development meetings, etc. (currently at 2)
- A minimum of six (6) education offerings (currently at 2)
- Increased communication and feedback to and from membership (we are developing membership surveys as well as providing event critique cards at each event)

As always, we look forward to your input and direction with regards to what you would like to see the Chapter provide to you, the member. If you have any additional ideas for Chapter goals or improvement suggestions on the events or courses that are provided, please e-mail me directly. Your inputs are always most welcome.

Have a great holiday season. On behalf of myself and the APICS-CALGARY Chapter Board of Directors, we wish you a happy holiday and a great new year!

Kevin B. Falenda, C.E.T., CPIM
President
APICS-Calgary Chapter
E-mail: president@apics-calgary.org
Phone: (403) 620-6944

Past President's Message

APICS International Conference and Exposition

Last month I attended the 2005 APICS International Conference and Exposition in Kansas City, Missouri from 16-18 Oct. Although I've been involved with APICS for the last few years this was a first for me. For those who didn't attend here is what you missed:

- 90 leading-edge educational sessions – these were grouped into 'focus zones' so if you have a particular interest, like for example, Lean Strategies, you could easily identify those sessions. Three to four Sessions ran concurrently so you had to choose the sessions that you were interested in.
- General Session Speakers – These were presented to the entire conference in the lavish Kansas City Music Hall. They included: Mike Ditka, Former Head Coach, Chicago Bears and New Orleans Saints; Ken Schmidt, former Director of Communications, Harley-Davidson Motor Company; Gary Maxwell, Senior Vice President, Merchandise Replenishment, U.S. Wal-Mart Stores Division.
- Trade Exhibition Hall – containing 130 leading solution providers demonstrating the latest technologies and products.
- APICS bookstore – Outstanding collection of Operations Management books and resources (as well as golf shirts, etc.).

I estimate there were about 3,000 attendees. It was a great opportunity to meet people from around the world who share similar professional interests. The social side was active as well; Kansas City is known for BBQ, and I can attest that they do a fine job! The unseasonably warm weather made a night out to an open-air jazz club with some folks from the Winnipeg APICS Chapter quite enjoyable.

To make things even more memorable, I had the good fortune to win a draw for a gift basket at the conference. The tickets were in support of APICS scholarship programs and each region donated a gift basket loaded with goodies. I won the basket from Minnesota. Who knew SPAM is from Minnesota? Or, that that many cans of SPAM would fit in one basket? Along with making my suitcase heavy, it did make for an interesting conversation with Canada Customs on my return….

Hats off to the organizing committee, who had the challenge of relocating the conference from New Orleans to Kansas City in a matter of a few weeks – a job well done!

Maybe I'll see you at the 2006 APICS International Conference and Exposition in sunny Orlando, Florida on October 29-31.

Flint Walters, CPIM
Past President
APICS-Calgary Chapter

Toward Rational Production Flow

Over the last few centuries there has been increasing recognition that the flow of materials through production processes and supply chains is a key determinant of manufacturing success. In this paper a progression of steps leading to modern production systems is briefly examined. Doing so can help strengthen appreciation of how layout, mechanization, material handling and quality all came together in creating what might now be termed rational production flow. In the first part of this paper the progress that was made to the end of the 18th century is examined. An example of production flow rationalization that precedes the Industrial Revolution is initially reviewed. Following this, the advent of the Factory System is discussed. In later parts of this paper the American System of Manufacturing, Mass Production and Lean Manufacturing will be briefly considered.

Part I - The Factory System of the 18th Century

One of the earliest references to material line flows was in the naval ship yards of Venice, known as the Arsenal. The Arsenal was founded in 1104, then expanded in 1303 and again in 1473. The respective sections became known as the Old, New and Newest Arsenal. From between 1290 and 1540 the most important vessel built within the Arsenal was the light galley. These galleys were mainly propelled by rows of oarsmen and designed for hand-to-hand combat. Superior speed was of the essence since this allowed warriors the choice of either pursuing or fleeing from the enemy.

Fairly early on there was a recognition that galleys could be constructed and sit in dry dock in a nearly completed state until required for service. This eliminated the need to crew the galleys not immediately required as well as reduced deterioration. At the same time, being able to launch these reserve galleys on short notice was considered of utmost importance. When called to service the seams were quickly filled, the hulls greased and the galley was launched. Once on the water, the oars, cordage, anchors, sails, masts, spars, deck furnishings and arms were installed. As early as 1436 there were descriptions of a direct line layout for this final assembly procedure. The galleys were towed along a narrow waterway with rows of warehouses on either bank. Material was handed out from windows in the warehouses as each galley passed. By the end of this unique work "flow" process, the galley was fully equipped.

From the mid-1400s the Ottoman Turks represented a particular threat. In 1537 a new conflict led to a decision to build a reserve of 100 galleys. In 1570 the whole reserve fleet was launched within 50 days when it became known the Turks intended to attack Cyprus. As well as line assembly, the success of the Arsenal in being able to furnish a fleet on short notice was due to advanced inventory control and the standardization of at least some components. For example, each galley in the reserve was numbered and material or components to finish this unit was then given the same number and systematically stored. Bookkeepers in the warehouses kept track of all transactions as well as monitored the quality of components constructed by the craftsmen.

The Venice Arsenal was possibly the largest industrial complex of its time, covering about 60 acres and employing 1,000 to 2,000 men. It should be noted that it reached this size and level of organization well before commercial shipyards became important in England, France or Holland. As well, large-scale standing armies and war fleets did not became common to most European states until the 1600s.

The factory system of production did not materialize in any significant way until the 18th century. In 1717 Thomas Lombe (1685-1739) set up what could be considered the first fully developed factory. This silk-throwing mill, located in Derby, was based on technology that his half-brother John smuggled out of Italy. The factory used power from water wheels for complex operations and employed about 300 people. By the middle of the century factories for manufacturing other types of goods had been developed, such as John Taylor's button factory at Birmingham. These replaced the domestic production system in which work was "put out" to individual craftsman. The main advantage of the factory at this time was that it allowed division of labour to be exploited, since all workers were under one roof. Years later Adam Smith (1723-1790) formally described division of labour within a Birmingham pin factory in his famous "Wealth of Nations" of 1776.

Most factory work was done by hand tools in mid-century, with machinery still being very primitive. Power sources and machinery were still largely made of wood and there was little to distinguish wood-working equipment from the limited metal-working machines in existence. Metal articles were usually small, such as time pieces, locks, instruments, tools and cooking utensils. Items like buttons or buckles used for personal adornment, called "toys", were also popular. Heavy metal work was largely confined to foundry work producing cannons or cylinders for early steam engines.

During the latter half of the 18th century one of the most visionary individuals in manufacturing was Josiah Wedgwood (1730-1795). The Wedgwood family had a tradition as potters going back to the early 17th century. In 1758 Josiah opened his own pottery in Burslem. He proved to be very successful in terms of innovation, quality and management. By 1765 he was supplying pottery to the Queen of England. In 1769 he expanded his operations by opening the famous Etruria works. By this time he was employing about 150 people.

Wedgwood made a number of contributions to production and supply chain management. First, he may have been the first to fully appreciate the practical links between logistics, price reduction and market expansion. A large problem for potteries was that goods required transport by pack-horse trains or carriages over rough roads, often resulting in 1/3 of the goods being smashed. Wedgwood early on recognized that canals could solve supply and distribution problems. In 1766 he was instrumental in starting the Trent and Mersey canal, on which he later constructed the Etruria factory. A canal boom followed from 1768 to 1776, whereby much of England and Scotland became linked through a network of waterways. As a result transport and damage costs dropped dramatically and the prices of pottery and other products fell. New markets opened up due to both the reduced prices and accessibility. It was not until the 1820s that railways began to provide a viable alternative.

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Brent Snider: brsnider@ucalgary.ca

Toward Rational Production Flow

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Second, Wedgwood was a pioneer in organized production. He not only used division of labour but also organized his shops so that there was progressive material flow through them. As well, Wedgewood implemented a system of cost accounting. The costs of individual operations were determined and products priced accordingly. Both factory layouts considering material flow and product costing were unique for the time.

During Wedgwood's era there was another development that would fundamentally change manufacturing systems. In the early 1780s Matthew Boulton (1728-1809) and James Watt (1736-1819), who were friends of Wedgwood's, were finally successful in developing a steam engine that could provide rotative power. Until this time Watt's steam engines, as well as the earlier engines of Thomas Savery (1650-1715) and Thomas Newcomen (1663-1729), were used only as mine pumping engines. Power could only be transmitted on the down stroke, with gravity acting to raise the piston through the weight of the pump plunger. The development of the rotative engine allowed its use in corn and cotton mills initially, and in other factories subsequently. As steam engines became a viable alternative of waterwheels, factories no longer needed to be located near streams providing sufficient water power. Shortly, there were also dramatic changes in power transmission. The huge Albion mill, opened at London in 1786, was the first to use iron shafts and gearing in place of wood. This innovation was attributed to John Rennie (1761-1821), who at the time was just starting an engineering career that would make him famous.

By the mid-1750s the naval ships of the various European powers had changed considerably in both design and function from those of the Venetians. They were powered by sails and had become large and complicated enough so that mechanical aids were important. A 74-gun ship required 1,400 pulley blocks of various sizes for handling sails, guns and other things. These pulley blocks were constructed and maintained by hand.

Walter Taylor II was a carpenter who became imprisoned by the French in 1746 after the ship he was working on was captured. In the early 1750s be returned to Southampton and found his son, Walter Taylor III, apprenticed to an artisan making pulley blocks. Walter II was well aware of the quality problems in pulley blocks and took it upon himself to learn as much as possible about other block-making facilities. After completing his investigative travels, he acquired the business employing his son. The Taylors then proceeded to develop machines for sawing, boring and turning components. Of particular significance was the development of the first circular saw. The initial machines were human powered, with water wheels and then steam engines coming later.

The quality of the Taylors' pulley blocks attracted the attention of the British Navy and they were eventually given a supply contract. Captain Bentinck, a naval officer, soon realized that the higher quality blocks could be made smaller and therefore cheaper. This also substantially reduced the weight of the mast and rigging. In 1770 the block shop and all inventory at the Portsmouth Dockyards burned down and a request was made to have Walter Taylor III replace the stock. Taylor and Bentinck took this opportunity to draw up tables of standards for the replacement of Navy blocks, based on the reduced sizes Bentinck had experimented with. Taylor also continued to put a great deal of design and experimental effort into reducing friction. Emphasis was placed on fits, materials and bushing designs. Taylor's success allowed him to guarantee his blocks for seven years.

At its peak, Taylor's shops near Southampton employed over 100 men. As well, he had block-making shops at Deptford and Walton-on-Thames. In 1803 Walter Taylor III died. Two years later, Horatio Nelson won the Battle of Trafalgar. In the five years prior to this 1805 battle, Taylor's factories had produced over 500,000 blocks for the Navy, as well as many pumps.

It could be argued that Walter Taylor II and III established many of the fundamentals of machine tool practice. Taylor's 1762 patent covered concerns related to squareness and parallelism. Stops for adjusting positions based on part sizes were also described The Taylors achieved repetitive accuracy with the use of rigid frames, slides, distance pieces, wedges, clamping screws and feed screws. Their machines were made of wood but wearing surfaces were faced with metal.

Another early proponent of machine tools was Joseph Bramah (1749-1814) of London. Bramah was a prolific inventor whose endeavours included the development and manufacturing of water closets, locks, fountain pens, beer pumps, fire engines and many other items. He is also often considered to be the father of fluid power for his work in applying hydraulic force to presses and cranes. In 1784 Bramah patented a security lock with sliders placed radially in a barrel. This lock was virtually impregnable. Prior locks had allowed thieves to easily make impressions of the notches in the sliders that allowed movement of the bolt. Bramah's new design was a big technical advance and demand soon exceeded his production capability. Machine tools hardly existed and both volume and precision were problems. As well, the concept of standard components that would allow interchangeability was not yet well understood. Bramah developed machine tools and mechanizing production of the locks to keep up with demand. Much of the execution in building tools was left to Henry Maudslay (1771-1831) who joined Bramah in 1789. Maudslay would later go on to become one of Britain's premier machine tool builders.

Lombe, Wedgwood, Taylor, Bramah and others all advanced the factory system within Britain during the first part of the Industrial Revolution. Prior to the 19th century there was little significant manufacturing in America. However there was one notable advancement which would have profound implications for later factory development. This was the automatic flour mill conceived by Oliver Evans (1755-1819) around 1782. By 1785 Evans had constructed a multi-story mill in which grain was elevated to the top floor. The grain then descended by gravity through levels containing the millstones and sifting machines, ending up as sacked flour on the ground floor. This was perhaps the first facility ever designed for continuous flow. In the process of developing this mill Evans also created various material handling devices and unique applications. These included bucket conveyors, belt conveyors and screw conveyors. Power was supplied by an overshot water wheel. Evans' mill allowed 300 or more barrels of grain per hour to be milled within a facility where only

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Membership Update

We're growing!! As of the end of October, we have grown to 112 members, an increase of 16, or more than 16% since our Annual General Meeting this past May.

As we have said a number of times in the past, by joining APICS you are investing in career success. APICS is the global leader and premier source of the body of knowledge in operations management, including production, inventory, supply chain, materials management, purchasing and logistics.

The APICS certification programs are just one of the many benefits of membership. These certifications are recognized world-wide as the standard of professional competence in the field of operations management.

The CPIM (Certified in Production and Inventory Management) program provides a common platform for individuals to evaluate their knowledge of the evolving field of production and inventory management. By obtaining this designation, you can increase your functional knowledge of production and inventory management, improve efficiency across the processes of your organization's supply chain and increase profitability by optimizing your organization's inventory investment.

The CIRM (Certified in Integrated Resource Management) program concentrates on the integration and collaboration among the key business functions of product development, sales and marketing, human resources, finance and operations. By obtaining this designation, you can gain a greater understanding of the strategy and role of the value-driven enterprise, collaborate with internal and external suppliers for enhanced profitability and initiate and manage change within the organization.

However, the supply chain profession is advancing at an incredible pace. Are you keeping up?

APICS has developed, and is bringing to you, the first comprehensive educational program for supply chain professionals – the CSCP (Certified Supply Chain Professional) program. This program takes a broad view of the field, extending beyond internal operations to encompass all the steps throughout the supply chain – from the supplier, through the company, to the end consumer – and how to effectively manage these activities to maximize a company's value chain.

The program provides professionals with the skill set necessary to understand and manage the integration and coordination of activities within today's increasingly complex supply chains. Individuals will learn how to design and develop a supply chain strategy that aligns with corporate strategy; understand how to manage supplier and customer relationships; and discover how to achieve the seamless integration of all processes to meet customer needs, reduce costs and increase profits.

The CSCP examination is available to individuals who have relevant work experience and education. To be eligible for the examination, a candidate must meet one of the following criteria:

- Bachelor's degree or equivalent, plus two years of related business experience
- CPIM, CFPIM, CIRM or CPM designation
- Five years of related business experience.

The program is being introduced in the United States and examinations are scheduled for March 11th, June 17th and December 2nd. More details will be available soon.

It is our Chapter's intention to have a certified instructor available to teach the courses by late Fall 2006. We will keep you posted as we get more information.

Dave Mandolesi, VP Membership

Toward Rational Production Flow

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100 barrels could be produced manually. At the same time the required labour was less than half. In 1795 Evans published a handbook, "The Young Mill-Wright and Miller's Guide", to publicize his invention. This became a best seller for both mill and water wheel construction, going through 15 editions before the Civil War. Evans, like Bramah, was a prolific inventor and achieved success in a number of other areas, most notably with high-pressure steam engines later in his career.

In summary it could be stated that by 1800 the merits of division of labour were understood. Layout designs for progressive material flow were in their early stages. The mechanization of manufacturing processes was not yet well developed although water and steam power had become more readily available. More progress had been made with wood-working, as opposed to metal-working, equipment but even these were mostly special-purpose rather than general-purpose machines. As well, with the exception of Evans' milling technology, there had been little attention paid to mechanized material handling. Finally, industries that would later be able to exploit the use of interchangeable parts were in the early stages of development.

In the next part of this paper the first mechanized production systems designed specifically for efficient material flow will be identified. As well, some of the first line flow systems with mechanized material handling will be examined. These advancements occurred in the 19th century, during which time the American System of Manufacturing gained prevalence.

S. T. Enns, ©2005

Webinars

APICS Webinars

Operations Management Training in a Budget and Time Constrained World
Submitted by Matt Hartman, VP Marketing – APICS Calgary Chapter

Do you need to educate large groups of staff, yet don't have the budget or time to arrange for the training? APICS has the answer for you. APICS offers a broad range of **operations, distribution and business management webinars** for a fraction of the cost of almost all other forms of training and consulting. APICS webinars are:

- Affordable – only $99 USD for members or $139 USD for non-members
- Flexible – you receive a 30-day window subscription to view the webinar at your leisure over the internet on demand
- Scalable – you choose how many people can attend
- Repeatable – after watching the original webinar you receive a CD copy of the presentation to watch again as many times, for as many people as you require
- Topical - cutting edge operations management topics which include lean manufacturing, six sigma, collaborative manufacturing, supply chain design, VMI and consignment inventories, supply chain metrics, etc.

Recent Webinars

As an example of some the topical subjects of the APICS webinars, our most recent offerings in December included:

- Applying Lean to Distribution and Customer Service
- Improving Enterprise Information Systems with Lean Principles

Member Benefits – Free Access to Archived Webinars

As an added benefit of being an APICS member you receive **free** access to a broad range of archived APICS webinars, which include such operations management subject matter as total supply chain cost analysis, change management, cycle counting, ERP systems, inventory performance, pull systems, etc.

To find out more or to sign-up to be notified about APICS webinars, visit the APICS website at **www.apics.org/Education/Webinars**.

Events Update

Dear Members,

As we head into 2006, there are exciting things happening in our APICS Chapter. This early in the New Year we have a tour at the now world-famous Chocolaterie Bernard Callebaut, which, lucky for us, is located right here in Calgary. In the spring we've been invited to tour Thixotech, the world leader in magnesium-injection moulding. If 'high-tech' and 'high calorie' isn't enough, we are also hosting some really great professional development meetings. The topic for the first meeting will focus on employee retention strategies presented by one of the top HR specialists in the city. So watch for announcements in your email in-box and in upcoming APICS newsletters. If you have any questions, or comments, or would like to make a suggestion for a tour or meeting, please feel free to contact myself at **tim.sweet@revolveconsulting.com**.

Tim Sweet, VP Events

APICS
The Association for Operations Management

BOARD OF DIRECTORS CONTACT LIST

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Kevin B. Falenda
Manager, Manufacturing & Operations
Net Safety Monitoring Inc.
kevinf@net-safety.com
Phone: (403) 717-8216

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Phone: (403) 236-6469

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flint.walters@gdcanada.com
Phone: (403) 850-1458

V.P. Education:
Brent Snider
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University of Calgary
brsnider@ucalgary.ca
Phone: (403) 220-7164

V.P. Communication:
Tajammul Hussan
Supply Chain Performance Specialist,
Supply Chain Management
Suncor Energy
t_hussan@yahoo.com
Phone: (403) 920-8360

V.P. Membership:
Dave Mandolesi
Manager, Materials Management
Standen's Limited
dave.mandolesi@standens.com
Phone: (403) 258-7814

V.P. Events:
Tim Sweet
President
Revolve Business Consulting Ltd.
tim.sweet@revolveconsulting.com
Phone: (403) 241-5875

V.P. Marketing:
Matt Hartman
National Director of Procurement & Materials
National Process Equipment
hartmanm@natpro.com
Phone: (403) 219-0293

Secretary:
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Associate Professor
University of Calgary
enns@ucalgary.ca
Phone: (403) 220-5802

Director-at-Large:
Mark Teeple
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mark.teeple@ge.com
Phone: (403) 214-4268

Director-at-Large:
John Hankins
Director of Sales & Marketing
Flextronics
john.hankins@flextronics.com
Phone: (403) 769-7725