

**7th Annual Chemical Management Services Workshop:
The Growing Trend of CMS**
GM Pontiac Campus: Pontiac, Michigan
October 23, 2003

Summary

Chemical Management Services Workshop: The Growing Trend of CMS, brought together 89 representatives from 37 different organizations to examine CMS from a wide variety of perspectives and industry foci. Highlights of the morning included case studies from GM/Quaker, AVChem/Boeing, UTC/Haas TCM, and Castrol/Delphi. The afternoon breakout sessions provided an opportunity to examine various facets of CMS in depth, such as international trends, expanding the service concept, information technology, and CMS in the smaller enterprise.

Companies and Organizations in Attendance

American Airlines, AVChem, Boeing Company, Castrol Industrial Americas, Chemical Strategies Partnership, Chemico Systems, CWT Distribution Limited, DaimlerChrysler Corporation, Dana Corporation, Delphi Corporation, Dow Corning Corporation, First Analysis, General Motors, Guide Corporation, Haas Korea, Haas TCM, Henkel Chemical Management, Houghton International, Hyundai Motor Company, Illinois State University, Interface LLC, Kyongbuk College of Science, Lockheed Martin, Mercury Marine, Morrison & Foerster LLP, Northern Michigan University, PPG Industries, Praxair Inc., Quaker Chemical Corporation, Rockwell Collins, Seagate Technology, Shell Services, Stanford Linear Accelerator Center, SusProNet, U.S. EPA, United Space Alliance, United Technologies Corporation.

Sponsors

The workshop was sponsored by Chemical Strategies Partnership and the CMS Forum, which includes the following company members:

Founding Members: Haas TCM and Air Products

Other Members: AVChem, Castrol Industrial Americas, Chemico Systems, Delta Airlines, DaimlerChrysler Corporation, Dow Corning Corporation, General Motors, Henkel Chemical Management, Hyundai Motor Company, Illinois Waste Management and Research Center, Illinois State University, Interface LLC, PPG Industries Inc., Quaker Chemical Corporation, Raytheon Company, Rockwood Electronic Materials, Seagate Technology, Shell Services USA, the Society of Tribologists and Lubrication Engineers, and United Technologies Corporation.

Welcome and Introductory Remarks

Jill Kauffman Johnson, *Executive Director, Chemical Strategies Partnership*

Jill introduced the day's speakers and discussed the role of Chemical Strategies Partnership (CSP). CSP is a non-profit organization working to promote the environmental and economic benefits of CMS. CSP's mission is to reduce chemical use, waste, risks, and cost through the transformation of the chemical supply chain by redefining the way chemicals are used and sold.

CASE STUDIES OF CMS PROGRAMS

The Evolution of Chemical Management Systems at a Corporate Level

Mike Knoblock, *General Motors Worldwide Facility Group*

General Motors (GM) began launching Chemical Management Services (CMS) programs in 1987. Currently, CMS programs have been installed in 89% of all North American GM manufacturing plants, and are expanding to GM facilities in Mexico, Australia, Europe and China. The basic chemical services of each program include at a minimum: an on-site laboratory, procurement services, process control, process improvement services, chemical tracking and reporting, and additional services specified by plants.

The implementation of CMS followed a grassroots process: from 1987 to 1995, programs were initiated on a plant-to-plant basis, and were specified and administered at the plant level. Plants implementing CMS programs witnessed significant financial and environmental improvements, such as better process control at the plant level, significant VOC reduction, and chemical costs reduction (on average 30% in the first year) as a result of standardizing chemicals within the plant and reducing the overall number of chemicals.

As CMS programs matured and the low-hanging fruit was picked, GM started to consider ways to optimize CMS services and increase its leverage of supplier expertise. Integration of CMS programs at the divisional level started in 1994, and the MetalFab Division started working with plants to develop a common divisional specification and administration process. Shifting the focus to the division level has helped to rationalize GM's supplier base, and has standardized products within the division. Additionally, major product/process development can be coordinated by divisional staff to facilitate the transfer of technical innovation from one facility to others in the same division, and encourage networking within divisions.

In 2003, GM re-quoted all Powertrain and Assembly programs to meet plant, divisional and corporate needs. A common contract structure was developed for all CMS programs, and the new contracts expanded the scope to include all indirect chemicals (which reduced the number of chemicals from approximately 150,000 to 70,000), and standardized data tracking (a new Chemicals Management tool was developed to track performance of CMS programs). Their supplier base was further rationalized from 13 to 5 to enable a better focus. To share best practices and lessons learned, quarterly web meetings are convened between the plant and its suppliers.

In moving forward, GM anticipates that CMS will continue to grow with the needs of GM, and further communication and networking will help to better leverage technical expertise. Networking will be expanded to include conferencing and web meetings to assure effective sharing of best ideas and common practices. As material savings plateau, process improvement is the only avenue to sustain ongoing improvements, and thus a paradigm shift within GM is needed to recognize and reward process improvements.

General Motors: Implementing CMS over a Decade

Allan Flachsmann, *CMS Divisional Coordinator for MetalFab Division, General Motors*
Art Helmstetter, *Global Director of Management Services, Quaker Chemical Corporation*

In response to a 2000 challenge by GM, Quaker led a study of automotive blankwash compounds to explore the possibility of finding a new chemical management process to maximize efficiency. This kind of process efficiency improvement is one way to generate new value in a mature CMS program. Therefore, Quaker did some initial research with GM and the blankwash equipment company on the chemical needs of the blankwash system. The following key performance

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indicators were selected to let Quaker and GM track the blankwash performance: the amount of mill oil the blankwasher removed, how much blankwash compound the blankwasher deposited, and the ratio of blankwash to mill oil on the blank going into the press.

Quaker found that it was necessary to look not just at the blankwash chemical but at the entire blankwashing system. In order to better understand the process of the product, Quaker analyzed the blankwash residue, looking at two types of coatings and doing a performance comparison of two comparable products from two suppliers. The blank wash efficiency proved to be only 20-60%, providing a cost reduction opportunity. The aim of the subsequent project was to develop the next generation blankwash product, improve corrosion protection for stamped parts, improve the longevity of the blankwash reservoir, and maintain the current forming performance characteristics.

Quaker developed two new chemicals for the blankwash product, which had fewer in-plant and downstream corrosion issues. The product usage was reduced due to better stability and improved formability, and the project was replicated in other plants because of its effectiveness. They are now looking to launch additional initiatives, especially around aluminum usage.

There were many reasons for this divisional program success, including: the management commitment from both GM and Quaker, the strong corporate support at the plant level from both GM and Quaker, the sound business cases on which the programs were built, the full integration of Quaker site staff with plant personnel and processes, and the fact that savings targets were well-defined and documented.

Getting Started with a New CMS Program

Frank Kimball, *VP Business Development, AVChem, Inc*

Roberto Zapata, *Sr. Procurement Agent, Boeing Aerospace Support Center*

AVChem, a spinout of the Boeing Company (Boeing), is a Business Process Outsourcing (BPO) company that offers chemical management services (CMS). With its operation started in August 2001, AVChem is currently supporting multiple customers across the U.S., including Boeing's Maintenance and Modification Center - Boeing Aerospace Support Center (BASC) - located at San Antonio. BASC provides critical support to U.S. Air Force global operation and U.S. forces around the world. The CMS program at BASC is part of Boeing's ongoing initiatives to outsource "non-core business". BASC was chosen because it is a relatively new facility - operated for about 5 years - and is on the leading edge of best maintenance and modification practices. The aim of BASC's program is to effectively manage and regulate all chemical requirements. The CMS contract for BASC was awarded to AVChem in April 2002.

AVChem provides a wide range of services, including: planning, forecasting and procurement of all products, warehousing of materials for just-in-time (JIT) delivery, stocking/replenishment of chemicals in point of use shop floor locations, complete tracking of all materials to use areas, maintenance of data for environmental reporting, and provision of environmental services such as shop floor management of waste. With the program implemented for more than a year, BASC has witnessed improved service level, including JIT delivery, and improved data tracking on chemical inventory and hazardous waste. Initial financial and environmental benefits are substantial. BASC has realized significant hard and soft cost savings (more than 25%) in terms of reduced total cost of ownership. Annual audits by both Texas DNR and internal Boeing environmental inspectors have been discrepancy-free. Additional, BASC's transported waste is being reduced. BASC's environmental reporting process has been streamlined as a result of better data tracking. AVChem was awarded the first year's cost savings share in August 2003 in accordance with the cost savings incentive plan established in the contract.

The success of BASC's CMS program comes from the joint effort of BASC and AVChem. At the initial stage, AVChem encountered a number of challenges, including skepticism of veteran production supervisors, the lack of high-speed internet in some parts of Kelly USA, difficulty in obtaining waiver from the Department of Defense for chemical warehouse, and lack of accurate baseline inventory data. AVChem believes that to sustain successes of the program requires AVChem to continuously maintain excellent rapport with shop floor workers, to further streamline the supply chain to maintain responsiveness and speed, and to strive to reduce total cost ownership for BASC.

Reselling a Chemical Management Program – Starting Over Again

Brian Ross, *Commodity Manager, United Technologies Corporation*

Leigh Hayes, *Executive Vice President, Haas TCM*

United Technologies Company (UTC) started implementing a chemical management program in 1999. The 1999 chemical management program placed a heavy emphasis on unit price – the supplier was rewarded a markup fee for every purchase – and lacked the appreciation of the value of chemical management services along the chemical lifecycle. The heavy emphasis on chemical purchase savings finally led to the failure of the 1999 program because the markup fee structure provided strong incentives for suppliers to look for cheaper materials, rather than higher quality products. There was generally poor data management and insufficient on-site engineering experience. In addition, because the program was initiated from the top down, there was a lack of site-specific goals and objectives for measuring program successes and failures.

In 2002, UTC decided to reform and re-sell its chemical management program. Instead of taking a corporate wide approach, UTC developed for each facility a site-specific business case and scope of services, and has successfully secured buy-in from the plant level. The focus of the 2002 program was also redefined to cover a wide variety of chemical-related services, including: process improvement, inventory ownership and management, leveraged procurement and supplier logistics to ensure just-in-time deliveries, chemical management planning, quality and specification control assurance, environmental reporting and MSDS management, on-site technical program support, and development and deployment of a web-based information management system. Haas TCM was awarded the 2002 contract for demonstrating its capacity for meeting UTC's comprehensive CMS requirements, and its understanding of the potential value of chemical management along the chemical lifecycle.

With the support of a comprehensive data tracking system and better integration of data across different stages of the chemical lifecycle, Haas helps UTC to streamline internal procedures. By eliminating unnecessary processes and improving internal efficiency, UTC has experienced significant savings from reduced management costs. In addition, Haas works together with UTC on source reduction initiatives such as process improvement, waste stream reductions, energy use reductions, inventory spoilage minimization, chemical reduction/reuse, and machine efficiency improvements. Haas also provides on-site technical support and works on reducing purchase price variance.

UTC and Haas concluded that factors leading to the success of the 2002 program included top executive support from UTC for the chemical management program, an empowered internal champion in UTC, a flexible scope of work and process improvement goals that fit the needs of individual sites, a change of purchasing mentality from focusing on price reduction to system savings, utilization of the pass-through model, capacity to appreciate value on enterprise data integration, and aligned program incentives for both suppliers and customers.

How to Keep Creating Value in a Mature CMS Program

Steven L. Avery, *Senior Administrator, Delphi Corporation*

Joel Day, *Sr. Regional Operations Manager, Castrol Industrial North America*

Castrol currently has CMS contracts with Delphi plants in Saginaw, Michigan and Athens, Alabama. Globally, Delphi has 18 manufacturing plants and operates as both a chemical customer and supplier, providing unique pressure on its chemical suppliers to be consistently competitive on chemical price and quality. Prior to 1986, Delphi had over 3,500 suppliers and 55,000 crib items. Over the past seventeen years, Delphi has implemented a comprehensive chemical management program. Though the two Castrol program sites have struggled with site turnover and leadership changes, they have been successful in achieving impressive cost savings by building trust between the two parties.

Delphi renewed its contract with Castrol three and a half years ago. The scope of work entails just in time delivery at point of use, providing cost-effective, environmentally friendly products, and offering full process involvement. Activities include metal forming, metal removal, cleaning, lubrication, waste processing, recycling, and environmental reporting. The typical profile of on-site staff includes chemists, chemical engineers, and mechanical engineers. Because of the long-term nature of the program, there are no longer any additional cost savings from chemical price reduction, so Castrol has had to look for process efficiencies in order to maintain economic benefit. They design effective metrics around set targets, and use them to challenge what kinds of chemicals Delphi should be using. Recently, Castrol mapped Delphi's waste stream to find a way to lower waste production. Every department supervisor issues a report on a daily basis to track spending and progress, which are then analyzed to ensure that the program is meeting its targets.

Some lessons learned are that suppliers need to measure hard savings, including price-to-price reductions, product replacement (with same or better performance), and process improvements. Trained onsite staff is critical to the success of a program. Additionally, it is important to be flexible to changing customer needs. For instance, in 1995, Castrol had over 13 onsite personnel, whereas now they have only nine. Since 1996, average annual savings have been \$627,000. Total savings from 1996 to the present amount to over five million dollars, with a 12.5% cost reduction in 2002 vs. 2001. Cost reduction primarily stemmed from increased effectiveness of cutting fluids with tooling suppliers and cutting oils with filter suppliers, recycling, and consolidating products.

BREAKOUT SESSIONS

Breakout Session One: International Trends

Chair: John Claussen, *Asia Project Manager, Chemical Strategies Partnership*

Panel: Arnold Tukker, *Senior Researcher and Consultant, TNO and SusProNet*

Scott Gordon, *Commodity Manager, Seagate Technology*

Eric Johnson, *Business Director, Henkel Chemical Management*

The discussion focused on different approaches for promoting CMS in foreign markets. The main challenges in bringing CMS to other countries are cultural differences, an ingrained cost-per-capita focus in many foreign markets, vertical integration among foreign companies, and labor and union issues. The main forces driving CMS in foreign markets are large multinational customers who have had success with CMS in North America and want to globalize CMS within their companies, ongoing quality efforts, and an increasing environmental mentality.

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Panelists discussed the unique challenges of promoting CMS in different areas of the world. The concerns driving CMS are very different in Europe vs. Asia, the two regions discussed most prominently in the session. In Europe, socialist labor conditions make bringing CMS to manufacturing operations there more difficult. Labor is less of an issue in China and other regions of Asia, but they tend to focus heavily on material savings. Outsourcing in Asian and Pacific markets is very sensitive, with the possible exception of Singapore, but is not as much of an issue in Europe. In Asia, productivity improvement is not as much of a priority, and the key is to focus on quality improvement. In Europe, environmental concerns are the main selling point for CMS. Regardless of the region or country, having support from local managers is very helpful. A regional champion is also very useful, and top-down support is key.

Participants agreed that CMS will continue to expand internationally, initially because of multi-national North American companies, and then due to market forces driven by CMS-savvy suppliers.

Breakout Session 2: Expanding the Service Concept

Chair: Tom Votta, *Deputy Director, Chemical Strategies Partnership*

Panel: Tim Behmlander, *Business Development Manager, PPG Industries, Inc.*

Bill Soliday, *Business Development Manager, Shell Services USA*

John Torgerson, *Market Development Manager, Dow Corning Corporation*

There is potential to expand the service concept for customers both around the chemical lifecycle and outside of chemicals. Expanding services is especially critical to more mature CMS programs. In the chemical lifecycle, potential expanded services include waste, new chemical formulations, and moving upstream towards process. Outside of the chemical lifecycle, possible services include EHS, facilities/maintenance, energy services, solid waste, and others. Panelists discussed some different approaches to defining and marketing those services.

It is difficult to put a value on service: there are major costs for service suppliers including labor and rent, both of which are difficult to quantify. Suggestions included asking the marketing or sales head or risk management personnel what they would pay for the service in order to better understand its value. Additionally, it is useful to go backwards through the life cycle costs of the chemicals in order to analyze the chemicals' uses and their development and assessment. One approach for suppliers is to start working up or downstream of their position in the chemical lifecycle in order to expand their service offering. Service providers are frequently stuck in silos, but it is important to form partnerships in order to expand to other service areas.

Breakout Session 3: Information Technology and CMS

Chair: Jill Kauffman Johnson, *Executive Director, Chemical Strategies Partnership*

Panel: Butch Byers, *Environmental Manager, Stanford Linear Accelerator Center*

Mitch Rushing, *President, Interface LLC*

Geb Marett, *Program Associate, Chemical Strategies Partnership*

The panelists discussed the benefits and challenges of implementing Chemical Management Information Systems (CMIS). To begin with, development of a CMIS program should start with looking at what the data should be able to do and then molding the IT program to that end; bottom-up development is by far preferable to top-down. Obviously, different situations require different models of data storage. Ideally, a CMIS database should be the parent database in any situation. GM uses a single source for information and then plugs that information into several of their legacy systems. For instance, small companies may need a crib, while GM, with true on-site service, does not. It is important for suppliers to note that many customers value the storage and analysis aspects of IT over logistics tracking. The key to a successful CMIS program is the flexibility of its design.

When creating a CMIS contract, it should be agreed upon and stipulated that data like MSDS's must be returned upon the termination of the contract in order to control data loss. A chemical service provider should not hold a company's information hostage, which is one common concern of customers. Additionally, customers want a common nomenclature for chemical data between competing suppliers in order to make transitions to different suppliers easier.

In the future, tax benefits will become an increasingly solvent issue as customers determine what processes entitle them to tax breaks due to better tracking with CMIS. Additionally, chips are being developed that scan products to determine how long they have been on the shelf and their originating sources.

Breakout Session 4: Supporting CMS in the Smaller Enterprise

Chair: Kris Pierre, *Manager, Green Supplier Network, U.S. EPA*

Panel: Tom Bierma, *Professor of Environmental Health, Illinois State University*

Leon Richardson, *President, Chemico Systems, Inc.*

Freda Fung, *Program Associate, Chemical Strategies Partnership*

Panelists discussed examples of CMS in the smaller enterprise, including universities and small manufacturing plants. Because of the smaller chemical spend, it is sometimes difficult to justify CMS through a cost analysis perspective at a small site level. However, successful CMS in the SME setting is possible by maintaining flexible approaches. There may not be a common solution for all SMEs, but there certainly are some common elements at work in each case. CMS programs in smaller companies are just as complex as those for larger companies. General themes discussed in the panel included the problem of resistance to CMS at various levels in an organization and the need to create economies of scale by combining the requirements from various companies in a region.

The corporate "hard line" which has proven effective in other examples of CMS simply won't work in a university setting because personnel can resist change due to tenure and grant-funded cash streams; so, it is necessary to show on-the-ground benefits in order to sell the concept. The problem is one of organizational culture, so it is necessary to use the threat of removing financial support for lack of compliance with initiatives, as well as to get away from pure stress on the bottom line of cost savings. The total cost analysis is what presents the case to most SMEs. Bundling companies, providers, and services (like central procurement outlets with a service fee) is one possible solution to create profitability. Bringing together local industries like hospitals and smaller colleges in the rural setting may produce scaled savings enough to kick-start a program. Partnerships and coalitions may be the key facilitating condition (as well as a multi-tiered team approach). A team approach is the best way to change a culture resistant to change. Long-term engagement and follow-through with SMEs will result in the evolutionary refinement of optimal approaches.

Future Directions for CMS and Perspectives from Participants

Tom Votta, Deputy Director, Chemical Strategies Partnership

Tom thanked everyone for attending the workshop. CSP and the CMS Forum continue to grow and adapt to the changing industry of CMS. This workshop clearly outlined the potential for CMS to keep growing beyond its current size and scope to international markets, additional service offerings, and smaller enterprises. As CMS moves increasingly into the mainstream, we are looking forward to finding new ways to effectively promote its adoption in new industries in North America and internationally.