WHAT TO DO ABOUT P2

CULTIVATING AN ENVIRONMENTAL MANAGEMENT SYSTEM

Our industry has not always been known for environmental innovation, but with the advent of the Strategic Goals Program a new generation of metal finishers committed to environmental management has emerged. Customer's such as the automotive industry have become a driving force to develop environmental management systems (EMS) like ISO 14000.

Industries today are pursuing programs for the minimization of waste and prevention of pollution. In addition to technical and analytical methods used, there is a third more holistic approach—management systems. The entire philosophy of management systems is "continuous improvement." It is a business process rather than a manufacturing process. Environmental management has become a basic consideration for many companies. The standardization of product quality and environmental protection is the wave of the future. International standards like ISO 9000 are quickly becoming a requirement to do business. If you have a quality system such as ISO 9000 or are working towards that end, shouldn't you consider an EMS to compliment your quality system.

The Metal Finishing Industry

Our industry is made up of small businesses performing a wide range of finishing services and employing some 100,000 people. A typical shop has 15 to 20 people and generates approximately 1.4 million in sales. The job shop metal finishing industry involves more than 4,000 firms, with total annual sales exceeding 4 billion. Our work is an essential part of the production of virtually all manufactured durable goods, ranging from nuts and bolts and surgical instruments to computer circuits and aerospace components. There is not one piece of metal in our homes or businesses that has not passed through a metal finishing plant somewhere. With out metal finishing the entire U.S. economy would grind to a halt.

Environmental Regulations

Environmental regulations for the metal finishing industry started with the clean Water Act of 1978, 40 CFR 413, which affected electroplaters. This regulation was implemented to control wastewater discharges and it contained the 1st pretreatment standards. The clean Water Act was amended in 1982 adding 40 CFR 433. This new regulation included all metal finishers and added stricter pretreatment standards and the first requirements for NPDES permits. Many more environmental requirements would soon follow: storm water regulations, Toxic Organic Management Plans, Form R or Toxic Chemical Release Report, Annual Air Emissions report, Discharge Monitoring Reports, and quarterly reports for the POTW's. The metal finishing industry is now the 2nd most regulated industry group in the U.S.

Environmental Management Systems

The most well known and predominantly used management systems are those formulated through the International Organization for standardization ISO, particularly ISO 9001 for quality and ISO 14001 for the environment. However, an EMS is simply an environmental plan that recognizes the potential impacts your organization may have on the environment. The plan addresses controlling and minimizing their impact on the environment. The ISO 14001 series of standards provides a vehicle by which an environmental management system may be constructed and implemented. This family of standards is strongly focused on establishing strong process controls, and providing an environment where continuous improvement flourishes. The ISO 14000 set of standards is broken down primarily into two groups: organizational standards and product related standards. The finishing industry is primarily interested in organizational standards: re: ISO 14001Environmental Management Systems (published September 1996).

The standard of particular interest is ISO 14001, Environmental Management Systems (EMS). EMS's are the instrument by which companies can integrate proactive measures into their environmental programs and upgrade from merely compliance-related activities. EMS is not a stand-alone system. It is to be worked in conjunction with other management requirements so as to provide not only environmental gains but economic benefits as well. The potential benefits from successful implementation of an environmental management system are numerous and include the following: cost control and process efficiency enhancements, industry and government relationship improvements, regulatory violation and liability reductions, insurance risks minimized, customer image improvements and potentially higher market share, and customer and public relations enhancement. ISO 14001 does

not state specific performance criteria. However, it does require that organizations create policies and objectives that take into account regulatory requirements and those issues within a company that may pose significant environmental impacts. An EMS is also a continuous improvement process that must be periodically reviewed for measuring performance against selected targets and the identification of new goals as business priorities evolve and change. The elements of ISO 14001 are listed in Table 2.

Table 2

Elements of ISO 14001

- 4.1 Environmental Policy
- 4.2 Planning
- 4.2.1 Environmental Aspects
- 4.2.2 Legal and Other Requirements
- 4.2.3 Objectives and Targets
- 4.2.4 Environmental Management Program(s)
- 4.3 Implementation and Operation
- 4.3.1 Structure and Responsibility
- 4.3.2 Training Awareness and Competence
- 4.3.3 Communication
- 4.3.4 Environmental Management System Documentation
- 4.3.5 Document Control
- 4.3.6 Operational Control
- 4.3.7 Emergency Preparedness and Response
- 4.4 Checking and Corrective Action
- 4.4.1 Monitoring and Measurement
- 4.4.2 Non-conformance and Corrective and Preventive Action
- 4.4.3 Records

4.4.4 Environmental Management System

4.5 Management Review

ISO 9001 (or 9002/3 as applicable) is often pursued prior to ISO 14001. There are many good reasons for this. ISO 9001 is tied directly to company's product. Thus, its implementation can improve the product while creating a heightened reliability, for the customer. This is pivotal considering that executive management buy-in is the first and most crucial step in pursuit of either standard. ISO 14001, typically exudes much less significant impact on a product, but provides a vehicle by which compliance with applicable regulations, operational efficiencies, and public perception are improved. Hence, ISO 9001 provides an excellent foundation for the pursuit of ISO 14001. The opposite, however, my not hold true. Management Systems in general provide a common focus that fosters: Greater communication company wide, written definitions of internal department policies, procedures and direction, improved sense of teamwork and overall company direction, working together towards a common goal, and dedication to continuous improvement. Prior to implementation of ISO 14001, many of the environmental, health and safety (EHS) functions may have been perceived within the company as inconvenient, optional, or of less significance than directly related production issues. In many instances, environmental issues were managed from the environmental department in the traditional role of "cop" with little in the way of a judicial system to insure conformance. In essence, accountability, was weak. The standard requires that all processes use suitable production, installation, and servicing equipment, and provide a suitable working environment. Translation of this requirement means that all processes must be in compliance with applicable environmental, health and safety regulations/standards. A process that is not in compliance is deemed one that is out of control. ISO 14001 registration alone will not significantly improve compliance, but it will close the loop on the management of environmental affairs. This will promote more proactive actions and a higher public presence.

Registration to ISO 9001 prior to ISO 14001 can have significant benefits. ISO 9001 plays a major role in the development of new business both domestically and internationally as well as improving relationships with existing customers. ISO 9001 also establishes a business management system that requires that all internal procedures be implemented as written, almost as if it were law. Tacking on an environmental management process once this structure is in place can be accomplished at a much lower level of effort. Remember, the implementation of a management process carries a much greater weight if it is tied to the survival or prosperity of a company (ISO 9001 registration) versus a perceived benefit through "doing the right thing" (current attitude toward ISO 14001 registration). The two most significant effects from registering to ISO 9001 prior to pursuing ISO 14001 are as follows: Establishment of a strong business management system which is monitored externally at fixed intervals (typically every six months); and creation of a document control system that necessitates ownership and responsibility at all managerial and departmental levels: company wide accountability. Seeking registration to ISO 14001 prior to achieving registration to ISO 9001, may be considered to be equivalent to "putting the cart before the

horse." In addition, ask yourself "What improvements will ISO 9001 bring to my business versus ISO 14001?" ISO 14001 is definitely a strong tool that establishes proactive environmental and process control programs. However, it is not generally accepted as a process wherein new business is generated. It is not specifically tied to the product, but rather to business practices. This reality, may change, but in the foreseeable future the "wait and see" attitude by business and the regulatory community only serve to reinforce that ISO 14001 is a "nice to have" versus that for ISO 9001 as a "got to have". However, the three U.S. automobile manufacturers have recently declared that ISO 14001 is required of all of their plants. Tier 1 and tier 2 suppliers can't be far behind. Most finishers are either tier 2 or tier 3 suppliers.

SWD and Environmental Regulations

S.W.D. was started in 1980 with 3 employees performing black oxiding, passivating, pickling, and cleaning. We currently have around 100 employees, and we have expanded into bright-dipping, phosphating, and fastener sorting. A big change occurred in the early 1990's. Regulators started some voluntary programs and started the move away from command and control. For the first time there was open dialog between industry and regulators. Still there was no trust between EPA and regulated industry sectors. S.W.D. joined the U.S. EPA's voluntary 33/50 program in 1991. S.W.D. reduced the use of Trichlorethane 111 by 98% from 1991 to 1992, and completely eliminated Trichlorethane 111 by the end of 1993. We were recognized by Al Gore as one of two metal finishers in the nation who successfully completed the program and received the prestigious Hammer Award. S.W.D. is a 1997 charter member of the Strategic Goals Program that falls under the Common Sense Initiative metal finishing sector. The metal finishing industry is the only industry out of five industries targeted by the U.S. EPA to work in cooperation with the regulators under the common sense initiative to successfully start a voluntary program. The first concession given to industry from the EPA was to extend the 90 day storage rule for F006 sludge to 180 days. More incentives are needed from the U.S. EPA to make the Strategic Goals Program a success.

Many things S.W.D. has done for the environment were not required, but they made good sense for the business and the environment: Counter flowing rinses to conserve water, Back rinsing after chemical baths, and Using treated water for wash down just to name a few. A wet scrubber and not a ventilator was added to evacuate the fumes from process tanks.

A Commitment to Quality

Environmental management has become a basic business consideration for many companies, including those in SWD's markets. The standardization of product quality and environmental protection is the wave of the future. We've already seen it in the automobile industry with initiatives such as QS 9000, and we're seeing it on a larger scale with international standards like the ISO 9000 and 14000 series. SWD was on its way to achieving certification under the QS 9000 and ISO 9002 standards when we found out about ISO 14001. We looked into the certification requirements for ISO 14001 and realized that we were already doing most of what they required, so we might as well get certified for it. With that decision, SWD became the first U.S. company to achieve ISO 9002, QS 9000 and ISO 14001 certification simultaneously. It was the right thing to do, but it was not free. The ISO 14001 certification effort added approximately \$50,000 and six months to the initial ISO 9000/QS 9000 certification, but the company is more efficient as a result of the work undertaken for ISO 14001. Equally important is the company's competitive position as the next century approaches. Accreditation under ISO 9002 and QS 9000 has become an industry standard in the 1990s. We believe that ISO 14001 accreditation will be just as much of an industry standard into the next century, and we're ready for it. If a company wants to be competitive, it has to be proactive by adjusting its operations to accommodate changing needs and standards in the industry.

Building the foundation

While the certification process and resulting environmental management system gave SWD improved control over its environmental management function, the company's commitment to environmental responsibility goes back many years. In the early 1990s, when SWD was bursting the seams of its existing facility, the company took a decidedly environmental perspective on obtaining the room necessary for its growing operation. The company built a new plant, integrating several environmental innovations into the structural, ventilation, lighting, waste control and storm water management systems. Although the innovations added \$300,000 to the cost of the building, the results were worthwhile. Included in those innovations were: a sloped floor in the plating area that ensures containment of process materials, exposed steel coated with foam and ceramics to prevent corrosion, self-contained truck docks that prevent contaminants from reaching storm sewers, a waste treating system built 16 feet below grade to allow for a gravity-feed system. That system eliminates pumping, conserves electricity and eliminates pump-related failures. A ventilating system, containing scrubbers, that is located inside the building to prevent storm water contamination. ¹/₄" PVC flooring covering the concrete under all process tanks and in waste treatment. Heavy mill plastic under the

concrete floor "Like putting a diaper under the baby". Lighting and compressed air systems chosen for their energyefficiency save 20% annually, and a combination heating/make-up air system allows for quick turnover of air inside the plant. The same kind of careful planning, with an eye to maximizing efficiency and minimizing environmental impact, has gone into SWD's day-to-day operations. The company's decision to recycle water led to installation of an elevated 5000- gallon water tank that uses gravity, rather than a pressure pump, to deliver recycled water for noncritical rinses. The decision to recycle office paper translated into the installation of a cardboard baler that turns cardboard scrap into a salable commodity. And the decision to replace hazardous chemicals with non-hazardous ones allowed S.W.D. to save more than \$100,000 a year in disposal costs. Continuous improvement is the name of the game for our company. With 15 individual projects completed in the past two years, these efforts have made our company more productive and more cost-efficient. Among these is the use of a chloride-based polymer and polymer feed pumps that automatically mix water and polymer in the waste treatment process; selection of a heavy zinc phosphate that reduced sludge generation by 80 percent; and the recycling of waste oil as fuel.

Beyond the Doors

SWD's environmental policy is, straightforward. It reads, in part, "SWD Inc: is committed to prevention of pollution and continuous improvement. To that end; every environmental aspect will be monitored to meet regulatory requirements and evaluated for opportunities to move beyond compliance." The same philosophy fuels work with organizations such as the Pennsylvania-based Multi-State Working Group on Environmental Management Systems, formed to investigate the effect of environmental management systems on environmental performance, conditions and compliance; stakeholder involvement; and pollution prevention. The group's investigations will focus on ISO 14000 pilot projects, and it plans to assemble relevant data at the University of North Carolina, Chapel Hill.

SWD also is one of approximately 10 facilities participating in a program sponsored by the Illinois Environmental Protection Agency run by the Waste Management Research Center (WMRC). The voluntary, Regulatory Innovation Pilot Program centers on five-year environmental management system agreements between the agency and participating facilities. In lieu of complying with federal and Illinois regulatory requirements, participants commit to meeting the requirements established in the agreement, which may include self-permitting for process and equipment modifications, custom reporting or record keeping, materials accounting and management. We've worked very hard to develop strong relationships with regulators. Generally speaking, the metal-finishing industry has had problems in the past, partly because the technology just didn't exist to deal with the environmental problems. That is changing now. Technology is catching up with the needs of the industry. Industry members and regulators are working together to find the most effective and cost-efficient way of achieving environmental objectives. And the industry itself is changing as our customers express greater quality and management expectations. Environmental management systems—whether [they include] ISO 14000 certification or not—are going to help determine which companies succeed into the next century and how our industry as a whole moves forward.

SWD is committed to helping improve our environment. The choice to develop and implement an environmental management system has saved SWD money and it has allowed us to see the big picture of how what we do at SWD impacts on the environment. Creating an EMS for your company will help make your organization become more efficient and give all of your employees a better understanding of how their actions effect the environment.

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- 4. Darin Childers, Integrating Quality and Environmental Management Systems, Bell Helicopter Textron Inc., Fort Worth, Texas