

THE MASSACHUSETTS TOXICS USE REDUCTION INSTITUTE

Implementation of ISO 14001 at the Acushnet Rubber Company, Inc.

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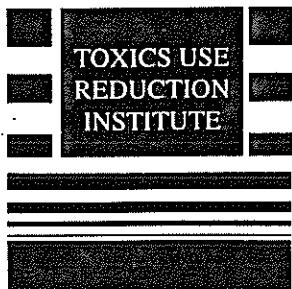
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**The Toxics Use Reduction Institute
University of Massachusetts Lowell**

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The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs, and provides technical support to promote the reduction in the use of toxic chemicals or the generation of toxic chemical byproducts in industry and commerce. Further information can be obtained by writing the Toxics Use Reduction Institute, University of Massachusetts Lowell, One University Avenue, Lowell, Massachusetts 01854.

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1.0 Introduction to ISO

The International Organization for Standardization (in French, the acronym is ISO) was founded in 1947 to promote the development of international manufacturing, trade and communication standards. ISO is composed of national standards bodies from 118 countries. The American National Standards Institute (ANSI) is the United States representative to ISO. The stated goal of ISO is "*to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services and to developing cooperation in the sphere of intellectual, scientific, technological, and economic activity.*" Initially ISO focused on technical matters such as product specifications and performance attributes. All standards developed by ISO are voluntary; the standards are documented agreements of technical specifications for companies to use as guidelines to ensure that materials and products fit their purpose. For example, the size and format of credit and ATM cards are taken from an ISO standard. Those cards that follow the standard, which defines such properties as thickness and placement of the magnetic strip, can be used worldwide.

In 1979 the ISO Technical Committee 176 was formed to address quality management and quality assurance concerns. There was a new emphasis on holistic business management systems. ISO issued the 9000 series of quality standards in 1987 which provides guidelines for designing and documenting a firm's quality procedures and practices. Development of ISO 9000 was dominated by European firms. US firms largely declined to participate but the standards have gained wide acceptance and are becoming a requirement for doing business in many industries throughout the world. ISO 9000 is made up of interrelated standards. ISO 9001 is the most comprehensive standard including design, development, installation and servicing elements. QS 9000 is the quality standard specific to the automotive industry. QS 9000 addresses environmental health and safety issues not mentioned in ISO 9000. Acushnet Rubber Company, Inc. is currently certified to the ISO 9001, QS 9000 and ISO 14001 standards. They are the first company in the world to be certified to all three ISO standards.

1.1 ISO 14000

ISO 14000 is intended to apply to a diverse range of companies and geographical, cultural and social conditions. It is therefore a general guide to firms describing the recommended scope of their Environmental Management System (EMS). ISO 14000 does not require specific operational practices or set performance standards for firms to meet. Its purpose is to provide firms with the elements of an effective environmental management system, outlining a method of integrating strategic environmental management into company

Figure 1
Reasons for Adopting an ISO 14000 EMS

- Improve environmental performance
- Meet customer expectations/vendor approval
- Reduce insurance costs
- Obtain a competitive advantage
- Conserve resources
- Control costs
- Increase acceptability of products and services
- Increase operating efficiencies
- Limit liability
- Improve government relations
- Improve worker safety and health
- Community goodwill

operations, thereby helping them to achieve environmental and economic goals. Implementation is verified through third-party audits to guarantee the reality of voluntary actions. Acushnet was the first company in Massachusetts and the 5th company in the U.S. to be recommended for ISO 14001 certification. The first four companies were certified to the draft standard and are currently in various stages of certifying to the final standard. Figure 1 offers a list of reasons for adopting an ISO 14000 EMS. Figure 2 gives a short list of some helpful ISO 14000 information sources.

Figure 2
Helpful Sources of Information on ISO 14000

The ISO 14000 Handbook, Joseph Cascio, Ed., CEEM Information Services, ASQC Quality Press.

"Introduction to the ISO 14000 International Environmental Management Standards," *International Journal Of Environmentally Conscious Design and Manufacturing*, Vol. 4, No.2, 1995.

Cichowicz, Judith A., "ISO 14000, New Opportunities for Expanding P2," *Pollution Prevention Review*, Spring 1996.

"ISO 14000 Update," *Business and the Environment*, Cutter Information Corporation.

"Preparing for ISO 14000: An Assessment Guide", *Total Quality Environmental Management*, Winter 1995/96.

2.0 The Acushnet Rubber Company, Inc. and ISO 14001

The City of New Bedford, Massachusetts, once the whaling capital of America, has encountered difficult economic times recently. The Acushnet Rubber Company Inc. is unique in New Bedford, not only because they have been experiencing unprecedented growth in sales and hiring in a city with high unemployment, but also because they have achieved this while posting outstanding pollution prevention results at their two New Bedford plants. Acushnet's Director of Environment, Safety and Health, Jack Bailey, feels that this increased efficiency and focus on pollution prevention played a critical role as his company prepared for certification to the new international standard, ISO 14000.

Acushnet Rubber Company, Inc. designs and manufactures elastomeric products including liquid cast polyurethane product lines serving several specific niches within key industrial markets such as automotive, office products and high performance o-ring seals. Some of Acushnet's customers include Ford, Chrysler, General Motors, Lexmark and Xerox. The rubber company employs 850 workers in the City of New Bedford.

Jack Bailey was in charge of the ISO 14001 implementation plan with solid support from Acushnet President and Chief Executive Officer, James DeMello, Vice President & Chief Financial Officer, Ron Fernandes and assistance from Acushnet's Compliance Officer, Nelson Alves. Jack Bailey drew on valuable experience gained from the company's ISO 9001/QS 9000 quality management systems to develop an implementation plan for ISO 14001. He also

employed Balaji Ekambaram of Sarla Quality Consultants, Providence, RI and Ted Cochin, an intern from the Massachusetts Toxics Use Reduction Institute to help him prepare for registration.

2.1 Preparing for ISO 14001 Certification

The implementation plan included the fine-tuning of an already existing EMS that links environmental impacts and aspects with the operation controls at their two New Bedford facilities. The ISO 14001 EMS standard specifies only the structure of the EMS and relies on companies to determine the content. The greatest amount of time and effort was spent on sections 4.2 and 4.3 of the standard. The main requirement of section 4.2 is documenting the environmental policy, and section 4.3 outlines the planning process.

To conform with the standard, management must establish an environmental policy which is documented, implemented, maintained and communicated to all employees. The policy must also be made available to the public and must contain at a minimum the following three commitments:

- ▶ Prevention of Pollution
- ▶ Continuous Improvement
- ▶ Compliance with regulations and other requirements

A copy of Acushnet's policy statement is in the Appendix. This statement was prepared by assembling a team to discuss Acushnet's commitments and the standard's requirements. The statement was added to and revised over the course of the ISO 14001 project.

Initial work focused on documenting the EMS and writing procedure for identifying aspects and impacts associated with the company's existing and new processes, products and services. This process entailed performing a "gap analysis" -- going through existing documents (e.g., purchasing records, materials use documents, monitoring logs and current environmental procedure manuals) to determine what information already existed and, therefore, what still required documentation. In many cases specific records and manuals could be referenced, rather than unnecessarily duplicating large volumes of documentation. This helped to save time, money and resources.

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In companies such as Acushnet that are already ISO 9000/QS 9000 certified, the framework is in place. The connections between quality and environmental performance allow a smoother transition in other ways as well. Many requirements such as training, communication, documentation, and process evaluation are common to both standards. Striving for continuous improvements in quality can result in positive impacts on the environment that are often overlooked. Among these benefits are reduced scrap material, more efficient use of resources, improved communication, training, and understanding of manufacturing processes.

2.2 The Massachusetts Toxics Use Reduction Act and ISO 14000

Because Acushnet is a Massachusetts company and falls under the Massachusetts Toxics Use Reduction Act (TURA), they report annually on inventories and emissions of regulated chemicals and plan biennially for reduction in emissions and byproduct generation. The TURA chemicals used at the two New Bedford plants at the time of the project were: trichloroethylene, chlorine, zinc oxide, and zinc stearate. Some similarities exist between the TURA planning requirements and the ISO standard. See Table 1 for a simple comparison of some of the requirements of the two systems.

Table 1: Comparison of the Massachusetts Toxics Reduction Act and ISO 140001

TURA	ISO 14001
Applies only to firms triggering certain threshold levels of use of listed chemicals	Any company can pursue certification
Requires firms to file annual inventory reports and perform planning for efficient use biennially	Requires firms to have documentation which proves conformance to the standard
Statement of facility-wide policy regarding TUR Statement of the scope and objectives of the plan	Statement of organization's environmental policy
Emphasizes team approach	Emphasizes team approach
Goal of continuous improvement	Goal of continuous improvement
Does not require an outside audit but plan must be approved by a TUR planner	Can use inside auditors and self-declare conformance with the standard or outside auditors can recommend certification
Identification of options for TUR	Identification of environmental aspects and impacts
Evaluation of appropriate options	Environmental performance evaluation
Setting of goals	Setting of objectives and targets
Requires that potential worker health and safety issues are addressed	Does not specifically address worker health and safety issues
Life cycle assessment	Life cycle assessment

One common theme between ISO 9000, ISO 14000 and TURA is that of continuous improvement. Massachusetts companies seeking ISO certification can use regulations such as TURA as benchmarks from which to work. ISO 14000 can serve as a mechanism to include pollution prevention and other environmental issues in business strategies and operations. When pollution prevention is incorporated into a corporation's EMS, it becomes part of the corporate culture, enabling the company to better understand economic benefits that can be achieved from undertaking specific pollution prevention projects. These projects can then be weighed objectively against competing expenditures. Companies need to ask whether clear, specific, challenging environmental goals and objectives have been developed and measurable targets set. They also need to show a strong commitment to meeting goals and resolving problems.

In order to integrate pollution prevention and cleaner production strategies into the Acushnet EMS, the Acushnet team chose to broaden the scope of the policy statement and planning steps to recognize that pollution prevention goes beyond toxic use reduction. Some additional areas in which any company developing an EMS could focus include: examining all waste materials (not only TURA-regulated chemicals), identifying opportunities for reducing consumption of natural resources, and creating a system that fosters continuous improvement of the EMS. Specific pollution prevention techniques not mentioned under TURA are available to help implement these strategies, such as process changes to improve energy efficiency and yield, product return for reuse or recycling, product changes to increase life, and non-closed loop on-site recycling.

3.3 Identifying Environmental Aspects, Impacts and Setting Targets

As part of Acushnet's overall environmental policy, continuous improvement teams for environment, safety and health already met regularly to discuss environmental concerns. These teams are comprised of production workers and management. Therefore, teams were in place to address the requirements of ISO 14001.

Figure 3
Existing Regulations and Records

Federal:

OSHA 29 CFR 1900-1926 (Occupational Safety and Health regulations for General industry and construction)
EPA 40 CFR Chapters I -V, Subchapters A-D, Parts 100-199 (air, water, waste)
DOT 49CFR Subtitle B, Subchapters A-D, Parts 100-199 (Transportation)

State of Massachusetts:

310 CMR 50 (Massachusetts Toxics use reduction act of 1989 -TURA) M.G.L c.21I,s.10
310 CMR 6.0-8.00 (Air Pollution Control) M.G.L. c. 111,ss.142A-142D
314 CMR 8.00-15.00 (Water Pollution Control) M.G.L. c. 30A,,ss.6 and c. 233 ss.75
310 CMR 30 (Hazardous Waste Regulations), M.G.L c.30A, ss. 6 and c. 233, ss. 75

City of New Bedford Code of Ordinances, Chapter 16 Article II

Forms and Records

Sampling and testing documents
Regulatory reports and permits
TURA
Material Safety Data Sheets
DEP requirements
EPA requirements
City of New Bedford requirements
The Federal Register

According to the legal and other requirements section of the standard, "*the organization shall establish and maintain a procedure to identify and have access to legal, and other requirements to which the organization subscribes directly applicable to the environmental aspects of its activities, products or services.*" Acushnet's environmental policy manual correspondingly states that they will "establish and maintain procedures to identify and have access to legal and other requirements directly applicable to the environmental aspects of its activities, products or services." Specific activities undertaken to help satisfy this requirement included researching existing permits and regulations at the federal, state and city levels. Members of the team also reviewed all regulations that applied to the facility, including industry requirements and media specific permit requirements. Figure 3 contains a list of the existing regulations and records that were reviewed.

The standard addresses the root cause of an environmental effect or impact. Specifically, "*the organization shall establish and maintain a procedure to*

identify the environmental aspects of its activities, products or services that it can control and over which it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment. The organization shall ensure that the aspects related to these significant impacts are considered in setting its environmental objectives.”

Acushnet's policy manual references this requirement by stating that they will “establish and maintain procedures to identify the environmental aspects of its activities, products or services that it can control and over which it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment.” The team’s brainstorming sessions provided valuable insight into possible causes of the environmental impacts associated with plant operations. The team first identified significant environmental aspects associated with the day-to-day functioning of the plant. Acushnet developed their own system to rank processes according to potential or actual environmental, health and safety impact.

“The team’s brainstorming sessions provided valuable insight into possible causes of the environmental impacts associated with plant operations.”

A great deal of attention was given to environmental effects in product standards development. Because a product's environmental effects are determined largely by the inputs used and the outputs

generated, Acushnet strives to perform a life cycle analysis on both new and existing products. During this assessment, the company identified many significant aspects and impacts ranging from generation of hazardous waste to worker commuting.

The next step was to develop a set of environmental objectives that the company as whole would work toward, along with corresponding performance requirements called targets. This process was outlined in the standard: *“The organization shall establish and maintain documented environmental objectives and targets, at each relevant function and level within the organization.”* Acushnet's policy requires documented environmental objectives and targets at each relevant function and level within the company. When establishing and reviewing its objectives, Acushnet will “consider the legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements, and the views of interested parties.”

The standard also requires that a vehicle for communicating these objectives and targets be developed and implemented. The organization shall *“establish and maintain procedures for: 1) internal communication between the various levels and functions of the organization, 2) receiving, documenting and responding to relevant communication from external interested parties, and 3) documenting its environmental aspects and environmental management system.”* Within their procedure manual Acushnet has procedures for documenting and acting upon internal and external communications from interested parties regarding its environmental aspects and EMS. Acushnet will consider processes for external communication on its significant environmental aspects and record all decisions.

3.4 Examples of Environmental Aspects and Targets

Two potentially significant environmental concerns identified during the brainstorming sessions were already being addressed due to company interest and other regulations. The first involved the degreasing of metal parts using trichloroethylene (TCE) in two degreasing tanks. TCE was of great concern due to the health risks it poses to workers and the environment, and the regulatory and disposal costs associated with its use. The company objective was to reduce the use of chlorinated solvents, so the target set was to eliminate the use of TCE in degreasing. To accomplish this, the objective and target had to be communicated to the appropriate personnel so that processes could be modified, alternatives tested and costs estimated. The result of this work is that the use of the degreasers have been discontinued and the cleaning step was eliminated for production parts. This project incurred an estimated annual cost savings of \$60,000.

Another identified concern was the disposal of solid waste; here the defined objective was to reduce the volume of solid waste. After the discussion, a 25% reduction was set as the target. A large percentage of Acushnet's solid waste is in the form of scrap rubber. Acushnet currently is working on a new recycling process that would grind up waste rubber and mix it back in with raw rubber at the beginning of the production process. This recycling/reuse program could be used for many types of processed rubber, not only the scrap rubber from the Acushnet plants, but also finished rubber products after they have exceeded their useful life. This will not only reduce the amount of waste rubber that is sent to the landfill, it will also help to reduce the impact of their product's disposal.

3.5 Implementation and Training

In order for the ISO 14000 EMS to truly be effective and accomplish its stated goals, it must be implemented. Implementation requires activities such as training employees, routinely monitoring and measuring performance against the plan, identifying non-conformances, keeping proper records, and taking corrective action where necessary. Internal audits must be conducted to assess the continual improvement and implementation of the system.

Acushnet currently identifies training and retraining needs on a quarterly basis. Personnel whose work may create a significant impact upon the environment are qualified through appropriate education, training and/or experience. As a result of preparation for ISO 14000 certification, these employees have been required to absorb significant amounts of new training and to document activities which had previously been accomplished informally. The success of these exercises would not have been possible without the tremendous help and support of the employees who were enthusiastic about continuously improving their environmental management system and the subsequent ISO 14001 certification. According to the standard, "*the organization shall identify training needs. It shall require that all personnel whose work may create a significant impact upon the environment, have received appropriate training.*" Acushnet maintains procedures to make its employees or members at each relevant function and level aware of the importance of and their responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the EMS, including emergency preparedness and response requirements. Records of education, training, certifications, and other qualifications are maintained by department heads or the Human Resources Department. Roles, responsibilities

and authorities are defined, documented and communicated through job descriptions in order to facilitate effective environmental management.

Acushnet maintains procedures to identify the potential for and respond to accidents and emergency situations. Every attempt is made to prevent and mitigate the environmental impacts that may be associated with them. A unique component of Acushnet's EMS is that it includes a health and safety system not required in the ISO 14001 standard. Acushnet reviews and revises, where necessary, its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations. These procedures are tested periodically where practicable.

"A unique component of Acushnet's EMS is that it includes a health and safety system not required in the ISO 14001 standard."

3.5 Documentation

Because the ISO 14000 standard focuses on continuous improvement, the EMS implementation plan should have a built in methodology for tracking and measuring environmental performance. The standard refers to these activities in the section on checking and corrective action, monitoring and measurement: *"The organization shall establish and maintain documented procedures to monitor and measure on a regular basis the key characteristics of its operations and activities that can have a significant impact on the environment. This shall include the recording of information to track performance, relevant operational controls and conformance with the organization's objectives and targets."* The implementation stage of the Acushnet EMS included the development of procedures to "monitor and measure on a regular basis (a) the key characteristics of its operations and activities that can have a significant impact on the environment, and (b) characteristics to ensure compliance with relevant environmental legislation and regulations." This will include the recording of information to track performance, relevant operational controls and conformance with its objectives and targets.

The standard requires that environmental records be maintained to demonstrate achievement and effective operation of the EMS. Acushnet found that integrating document and data control with the ISO 9000 quality system could save time and resources. As with the ISO 9000 documents, Acushnet maintains procedures for identification, storage, maintenance, and disposition of environmental records. Records are stored and maintained for easy retrieval. Environmental, health and safety (EHS) records are released to interested parties at the discretion of the EHS Director. Procedures are in place to control all documents and data relating to Acushnet's standards. Acushnet maintains procedures to ensure that these documents are reviewed and approved by authorized personnel prior to issue. Clearly identified current revisions of documents are available at appropriate locations. Obsolete documents are either removed, destroyed or marked suitably. External documents (e.g., documents required by state and federal environmental laws) are controlled by designated personnel. Any changes or modifications to documents are reviewed and approved by the same authority that approved the original, unless designated otherwise. Controlled copies of the Environmental Manual are distributed internally. Copies may be distributed to customers and updated only upon request by the customer.

3.6 Audits

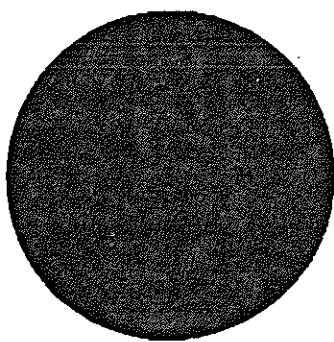
Acushnet used two types of audits: internal and third party. Two teams of internal auditors, meeting weekly, were selected to perform the internal audits at Acushnet. Audits are carried out by trained, internal auditors in compliance with procedures to ensure conformance to the ISO 14001 standards and legal and other requirements. The EMS audit schedule encompasses all activities, products and services related to environment, safety, and health impacts. The schedule is planned on the basis of status and criticalness of the activity. An auditor doesn't audit functions under their direct responsibility. The audit results are brought to the attention of the personnel responsible for the activity being audited. Audit results are evaluated and corrective actions planned in a timely manner. These corrective actions are followed up for their implementation and effectiveness. The results of all internal audits are documented and used by a Management Review Group to determine the effectiveness of the EMS system.

Acushnet used third party auditors to certify compliance to the standard. During the preliminary audit by TUV America, Acushnet's EMS and supporting paperwork was reviewed for conformance to the ISO 14001 standard. In addition, many employees were interviewed and asked to describe the environmental impact of their job. The auditors concluded that the EMS system and paperwork was in conformance but recommended additional training of employees on practicing spill drills and environmental awareness. Acushnet had three weeks to complete the additional training prior to the follow-up audit. The follow-up audit resulted in a recommendation for certification to ISO 14001. Acushnet became the first company in Massachusetts to obtain ISO 14001 certification.

4.0 Conclusion

A properly-functioning EMS can be a cost saving system, eliminating production inefficiencies and environmental risks throughout the product life-cycle. This life-cycle approach helped give a broader perspective to the assessment of environmental aspects and impacts, providing a more comprehensive understanding of a product's environmental effects and how changes to the product will alter those effects. The Acushnet team was able to consider aspects which might have otherwise gone overlooked, such as packaging and energy conservation, in relation to product standards development. This is one of the many areas in which the ISO 9000 Quality Management System augmented and facilitated the development of an effective EMS. Concentrating on production-based pollution prevention and design for the environment was the factor which helped make the ISO 14001 process a worthwhile investment rather than just another cost of doing business.

COMMITTED TO A SAFER WORK PLACE AND A CLEANER WORLD



To ensure employees, company's, and society's sustainability, Acushnet is committed to develop and maintain a management system that integrates sound business practices with environmental, safety, health, and quality objectives.

These objectives will be reviewed and updated periodically.

Acushnet will strive for continuous improvement in all activities with focus on pollution prevention, life cycle analysis, and toxic use reduction techniques. Acushnet will work with governmental and non-governmental agencies including vendors, research organizations, the local community, and customers to improve product and processes so as to reduce their environmental, safety, and health impact. Acushnet will promote responsible and accurate statements of its product while avoiding false or misleading claims of quality, safety, health, or environmental benefits.

Acushnet will comply with all federal, state and city regulations.

Jim DeMello

Ron Fernandes

Jack Bailey

