

Environmental Management System at an Iron and Steel Plant



Transferable Solution

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Contact Information

Project Title: Development and Implementation of an EMS at the Steel Production Flow of Sidex Galati

Leader: Sidex S.A. (Galati, Romania)

Partner: Aquatest (Prague, Czech Republic)

Location: Galati, Romania

Project Duration: January 2000 – December 2000

EcoLinks Project Investment: Total Project Investment: \$80,000; EcoLinks Grant Support: \$50,000; Project Team Cost Share Contribution: \$30,000.

Best Practice: Transferable Solution

This project is a Best Practice because it demonstrates how to generate an Environmental Management System (EMS) starting from an initial environmental review stage and ending with a pre-certification assessment. The EMS successfully promotes recycling and oil recovery improving Sidex's environmental performance and generating cost savings. Sidex's experience can be easily replicated in similar facilities throughout the region. The general steps and procedures used to develop the EMS at Sidex, for example, can be used to guide EMS development in other companies.

Project Summary

Sidex is the biggest iron and steel works plant in Romania. It produces steel plates, sheets and pipes. Iron and steel works involve high levels of energy consumption and

produce vast quantities of wastewater and solid waste. Hot rolling, used to develop heavy plate and hot strip, raises several environmental concerns. The consumption of fuel and electricity is especially high in this process. The emission of air pollutants such as NO_x, SO₂, CO₂, and CO is inappropriately high due to high fuel consumption and inefficient combustion. The generation of water pollutants such as suspended solids and hydrocarbons (i.e., oils) is also an environmental consideration in the production process. Solid waste is further generated from dismantled refractories and furnace scale.

With the support of an EcoLinks Challenge Grant, Sidex teamed with Aquatest, a consulting company from the Czech Republic, to develop an Environmental Management System (EMS) at Sidex. The goals of this project were to decrease the adverse environmental impacts of production, achieve compliance with environmental regulations, improve the company's competitive stance on the open market, reduce production costs, and improve public access to environmental information.

The project involved monitoring and assessing the environmental aspects and impacts of site operations. For example, an evaluation of the major material and energy consumption flows was conducted in order to identify possibilities for pollution prevention. Based on an analysis of the environmental components reviewed, an environmental management program was developed. Sidex employees were successfully trained to participate in implementing the new program.

The immediate results of this project include a significant reduction in energy and material consumption leading to environmental and economic benefits. Less consumption of resources and less waste means less impact on the environment and more economic savings. The waste separation program developed as part of this project provides a savings of approximately \$24,000 per year. An annual savings of \$3,000 from oil recovery (650 liters of oil recovered in one month) can also be expected.

Project Activities

The goal of the project was to establish an EMS at Sidex. An EMS was developed and pursued as part of the project to improve the organizational and technical aspects of Sidex operations.

1. Conducted initial environmental review

Action: An assessment of the legal issues and reporting procedures for ISO 14000 certification was made. The working procedures using registration sheets in environmental auditing were established. A meeting with the certification agency (Representation Office of TUV Sud Deutschland in Romania) was conducted.

Product(s): 1) EMS Implementation Team at Sidex 2) Environmental Assessment Report 3) Working procedures regarding registration sheets for environmental auditing 4) Meeting with certification agency.

2. Prepared employee training courses

Action: Training courses on ISO 14000 series were developed for Sidex management and the Sidex EMS Implementation Team.

Product(s): Training courses on ISO 14000 series.

3. Designed and prepared EMS documentation

Action: The environmental aspects of Sidex operations were assessed and prioritized. Environmental objectives and targets were set. An environmental management manual was prepared. System and operational procedures were established. Posters and leaflets were produced and delivered. Specific implementation instructions for the plant's main departments were developed.

Product(s): 1) An assessment of environmental considerations at Sidex 2) Documentation supporting the EMS: Environmental Management Program; Awareness Raising and Advertising; Environmental Manual, System Procedures, and Operational Procedures 3) EMS implementation instructions for plant managers.

4. Conducted training for trainers and for employees in EMS implementation

Action: KPMG, the project associate, conducted a training-for-trainers for the implementation team. Employee training sessions were conducted later by the implementation team.

Product(s): 1) EMS trained trainers of the Sidex Implementation Team 2) EMS trained Sidex employees.

5. Conducted two study tours of other EMS programs

Action: Study tours of the EMS programs at the iron and steel plants at VSZ Kosice in the Slovak Republic and Nova Huta Ostrava in the Czech Republic were conducted.

Product(s): Study tours for information exchange.

6. Implemented an EMS in the Steel Plates Plant at Sidex

Action: An environmental management system was designed, documented, and partially implemented within the Steel Plates Plant, one of Sidex's largest facilities, that includes: Hot Rolling Mill, Cold Rolling Mill, Heavy Plates Rolling Mill, and Longitudinal Welded Pipes Plants

Product(s): EMS in place at one of Sidex largest plants.

7. Conducted a pre-certification audit

Action: A pre-certification audit was conducted that included 1) an on-site review of EMS documentation, 2) an on-site inspection and interviews with the management

and staff, 3) a presentation of preliminary findings by the EMS Implementation Team and Sidex management, and 4) a final report of the findings and recommendations.

Product(s): Audit report.

8. Conducted pilot project on wastewater monitoring

Action: Wastewater was monitored at Sidex using a portable ultrasonic flow meter and an automatic measurement and pH control loop. Water samples were analyzed weekly in a specialized laboratory. The parameters that were measured included pH, amount of suspended solid waste, concentration of SO_4^{-2} ions, and total concentration of Fe. The data gathered in the monitoring process was used to control the wastewater quality and to prevent polluted effluent from being released into the river Siret.

Product(s): Survey on wastewater parameters.

Project Benefits

This project provides multiple capacity building benefits as well as environmental and economic benefits. The training program developed and delivered as part of this project enhanced the capacity of Sidex to implement an EMS by training employees in the key aspects of environmental management according to ISO 14000 series standards. Through the project initiatives, Sidex reduced its consumption of energy and materials producing both environmental and economic benefits. These benefits are outlined below.

Capacity Building Benefits

This project built the capacity of Sidex employees to participate in implementing an environmental management scheme. Their participation was critical to the success of the EMS prepared in this project. Approximately 5000 employees were trained in environmental issues. This raises employee awareness of environmental problems and the link between health and the environment at Sidex. Ultimately, the training provided the basis for improving the environmental conditions at Sidex through changing personnel work behavior.

Environmental Benefits

Several immediate environmental benefits were generated through this project. The company has increased its overall efficiency by reducing its consumption of energy and materials through improvements in maintenance and monitoring.

The maintenance of equipment was improved after an evaluation of lubricant losses. As a result, oil and grease losses were reduced by 10% and 650 liters of oil were recovered in one month. In this way, non-renewable resources are conserved and environmental damages from oil leaks are prevented.

The management of waste materials and wastewater was improved. A selective waste collection system for recycling was established which was unanimously accepted by the management and Sidex employees. Six different types of waste (e.g., waste oil, waste grease, rubber, paper, and plastic) are now collected in separate containers. Waste separation is important in recycling products for re-use and reducing the amount of waste that ends up in landfills or incinerators. The wastewater recycling rate was increased improving the management of wastewater overall.

Economic Benefits

This project generates several economic benefits. By improving consumption patterns and waste management approaches, savings are generated.

The main economic benefits of this project result from more efficient consumption, especially of oil and grease, achieved through organizational and technical improvements. As a result of the improved maintenance of company equipment 650 liters of oil are now recovered monthly, resulting in an annual savings of \$3,000.

The selective industrial waste collection system will bring additional benefits as the factory recycles and reuses ferrous waste as a raw material in the main production lines. Another benefit is the improved image of Sidex in the market due to the EMS certification expected by the end of 2001. Waste materials separated and prepared for recycling can be delivered to recovery facilities. This will result in an anticipated savings of \$2,000 per month. Further savings are expected with the implementation of a waste separation system in other areas of Sidex.

Lessons Learned

The following lessons were learned during this project:

- The success of an EMS requires physical changes in company operations as well as changes in the perspectives of employees.
- Establishing a fully equipped office at Sidex for the Implementation Team was “a big help for this project.”
- Site visits to plants where an EMS has been implemented facilitated specific knowledge transfer.
- The implementation of an EMS may require more resources than originally anticipated including financial resources as well as human resources. It is important to try to approximate these needs in advance.
- Communication can be improved amongst the people developing the EMS documentation by clarifying individual tasks before the work is started.
- Outreach and media relationships should be stressed to share the benefits of the EMS both for the company as well as for the community-at-large.

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