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## **ENVIRONMENTAL MANAGEMENT IN A STEEL SMELTING COMPANY AND ENVIRONMENTAL ASPECTS**

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### **ABSTRACT:**

The paper presents concept and features of environmental management. Modern environmental management is active, constants and preventives and it is also a set of integrated activities into the environmental protection domain. To realize the active management companies should identify the environmental aspects and their influence on environment. Analysis of environmental aspects helps to solve environmental problems of steel smelting companies. On the base of realized analysis companies in environmental management tend to toward preventing the waste production. Companies continuously improve their management systems to reduce negative environmental impacts but first of all they should correctly identify and classify environmental aspects. The paper shows how to do it.

### **KEYWORDS:**

environmental management, environmental aspects, environmental management system

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### **1. ENVIRONMENTAL MANAGEMENT AND ENVIRONMENTAL MANAGEMENT SYSTEM**

The environmental management appeared in the late first half of the 20th century along with the development of the ecology awareness of societies and companies. The term of environmental management mainly refers to an environmental management system integrated with the general management system. The Environmental Management System comprises an organisational structure, planning, responsibilities, and rules of proceeding, procedures, processes and measures used to develop, implement, analyse and maintain the environmental policy [1]. The structure of environmental management is presented in the standard ISO 14001. The environment management as the management of polluted and damaged environment. So the environment management tends towards eliminating wrong impact (pollution prevention). The Environmental Management System is based on environmental policy.

The company in metallurgical sector know, that the environmental policy is the most important task of modern management. The environmental policy has to be co-ordinated with other company's policies and it may not be contrary to them. The environmental policy is first step to build the environmental system. In it the company declares that environmental management is priority for it. The environmental policy is a written statement of goals and intentions regarding the use, protection and development of natural environment. The next step is realizing the inventory analysis

to identify the environmental aspects and impact. Companies in metallurgical sector can use different classification of environmental aspects (table1). Lately they can estimate particular aspects (table 2). On the inventory table the company can separate the key aspects and settle the environmental programme. The companies in metallurgical sector are obligated to decrease environmental load. The programme is a plan, set of independent activities. The programme of environmental tasks and works to be performed in an agreed time. Environmental tasks are "specific requirements relating to effects of environmental activities expressed by volume, always, if possible, applying to companies or parts of companies and resulting from environmental goals" [1]. Realizing of the environmental tasks is connected with cleaner production (CP). The company can obtain the certificate CP or the certificate ISO 14001. All activities (products) in steel plants are controlled from cradle to grave to reduce contaminations. The Environmental Management System is based on continual improvement of it.

## 2. ENVIRONMENTAL ASPECTS – CLASSIFICATION

Environmental aspects may be classified according to various criteria. There are external aspects, outside of the company, e.g. transportation of hazardous materials, as well as internal aspects, inside the company. The aspects may concern different elements of the environment. Time-wise, there are current, potential and past aspects. Taking into account the importance of a given aspect, companies often differentiate between significant (important, key, priority) and secondary (insignificant) aspects.

Table 1. Environmental aspects classification [2]

No.	Classification criterion	Types of environmental aspects:
1.	Place	1. at the company 2. outside the company
2.	Link in the value added chain	1. on the part of the supplier 2. on the part of the company 3. on the part of the customer
3.	Impact on the environment	1. positive impact 2. negative impact
4.	Importance in the environment management process	1. significant – key, important, priority (have to be controlled and monitored) 2. insignificant – secondary
5.	Environment components	1. the air 2. soil 3. water 4. other
6.	Time	1. past 2. current 3. potential
7.	Type of activities carried out by the company	1. related to the core business 2. related to the auxiliary business
8.	Operating conditions	1. in normal operating conditions 2. in special operating conditions e.g. start-up of a new production line, launch of a new product 3. related to accidents and emergencies
9.	Factors that bring about the environmental aspect	1. company's activity 2. company's products 3. company's services
10.	Regulations	1. legally regulated 2. non-regulated
11.	Impact of the aspect	1. local 2. regional 3. national 4. International
12.	Susceptibility of the surrounding environment	1. causing low susceptibility 2. causing average susceptibility 3. causing high susceptibility

### 3. ENVIRONMENTAL ASPECTS – EXAMPLD METHOD OF IDENTIFICATION AND ESTIMATION

In accordance with ISO 14001 requirements a steel plant should develop a procedure for identifying environmental aspects of its activities, products and services, that are to be controlled by the company. First and foremost a company is to identify significant environmental aspects, i.e. those that have, or can potentially have, a significant impact on the environment. Since the term 'significance' has not been defined with precision, the process of identifying significant environmental aspects at a company usually involves the 'brainstorming' method or the development of significance criteria. Detailed technological diagrams along with material and energy consumption balance are particularly helpful in the process of environment aspect identification and classification. A correct choice of significant aspects constitutes the main tool of the Environmental Management System, indicating the direction of steel plants' actions for environment protection.

At steel plants the main criteria in the process of environmental aspect evaluation include both environmental criteria (scope, duration, toxicity, likelihood of impact) and those related to economy and business (costs of changes, compliance with legal regulations, corporate image).

The evaluation of environmental aspects may be carried out with the use of points. The process involves the following steps:

1. Make a list of environmental aspects.
2. Evaluate each aspect using points, from 1 to 3, where: 1 – less important aspect, 2 – of average importance, 3 – very important. The points express the significance (importance) of the aspect for the environment, globally.
3. Evaluate the impact of all environmental aspects of your company on the environment, on a 1 to 5 scale, where: 1 – very small impact, 2 – small impact, 3 – average impact, 4 – strong impact, 5 – very strong impact.
4. Multiply the significance by the impact.
5. Out of the whole set of identified aspects, select the significant ones, which have to be controlled and monitored by the company (aspects with the highest value (product)).

Table 2. Inventory and estimation table of environmental aspects (points are exempld) [2]

No.	Environmental aspects	Points (significance) from 1 to 3	Scale of impact from 1 to 5	Multiply the significance by the impact
1.	Emission of CO <sub>2</sub>	3	3	9
2.	Emission of SO <sub>2</sub>	3	4	12
3.	Emission of CO	3	4	12
4.	Emission of NO <sub>2</sub>	3	4	12
4.	Wastewater	1	4	4
5.	Sludge	2	1	2
6.	Noise emission	2	2	4
7.	Dust emission to the air	3	3	9
8.	Power consumption	2	2	4
9.	Leakages to the soil	2	3	6
10.	Emission of fluorine, aliphatic hydrocarbons, methane, hydrogen chloride and PCDD/F	2	3	6
11.	Waste production – iron-bearing sludge	2	3	6
12.	Water consumption	2	2	4
13.	Waste water production	2	3	6
14.	Effluent	3	4	12
etc.	Other contaminations			
	Sum total			

## 5. CONCLUSIONS

The analysis shows that environmental protection management has to be an orderly system of actions guaranteeing that the company's environmental protection policy will be executed. The document reviews the most important problem how to identify environmental aspects in steel plants. Inventory analysis of environmental aspects is the basic step to build Environmental Management System. In the paper only one inventory method was presented. The key goal of it is selection of the most important aspects that are base for environmental programmes in smelting companies.

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