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Evaluation Study of Environmental Impact on Industrial Processes

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Abstract
This paper presents a study on the evaluation of significant environmental aspects of industrial processes according to ISO 14001: 2005. The aim is to establish harmonized methodology t the organization, identification of environmental aspects associated with the operations of collection, storage, recycling and the impacts associated with them in order to monitor and control significant environmental aspects. The process of identification of environmental aspects is made by analyzing all processes / services, phases, operations, activity areas, taking into account normal operating conditions, abnormal (starts, stops, overloading, maintenance, etc.) and emergency situations. The results of the evaluation process, the main significant aspects of environmental concerns to: risk of leak of dangerous substances, soil pollution, waste oil generation and impregnated materials.

Keywords
evaluation criteria, significant environmental aspect, environmental impact

1. Introduction

Environmental impact assessment is a process accordance to national environmental legislation and provides that activities with significant environmental impact to undergo a process of environmental impact assessment. Environmental impact study consists on prediction estimation of the effect on the environment of certain activities in various conditions that can occur in order to quantify the effective environmental impact [1].

Environmental management consists of identification, evaluation, monitoring and control of environmental aspects in order to prevent the pollution and to improve the environmental quality, and to minimize the amount of waste discharged into the environment [2, 3, 4].

The overall environmental management objectives are:

- Reducing the amount of waste produced within the organization, selective controlled storage and efficient and ecologically valorization of recyclable waste;
- Efficient use of raw materials and utilities to save natural resources, and wherever possible use materials with minimal environmental impact, recoverable or recyclable;
- Monitoring the customer satisfaction and other interested parties, in order to continuously improve the product quality and services and to anticipate and exceed their expectations;
- Improving the environmental performance of the organization, pollution prevention, promotion of technical solutions and technology "clean", reducing the environment;
- Implementation of measures to reduce the negative environmental impacts caused by emissions into the atmosphere and waste waters resulting from technological processes and activities.

2. Environmental Impact Evaluation. Case Study

2.1. Evaluation methodology

The case study consists in identifying, assessing, monitoring and control of significant environmental aspects specific to industrial processes according to ISO 14001: 2005. The scope is to identify the

environmental aspects associated with the processes of collection, storage, recycling and to evaluate the impacts associated with them in order to monitor and control significant environmental aspects (Fig. 1) [2].

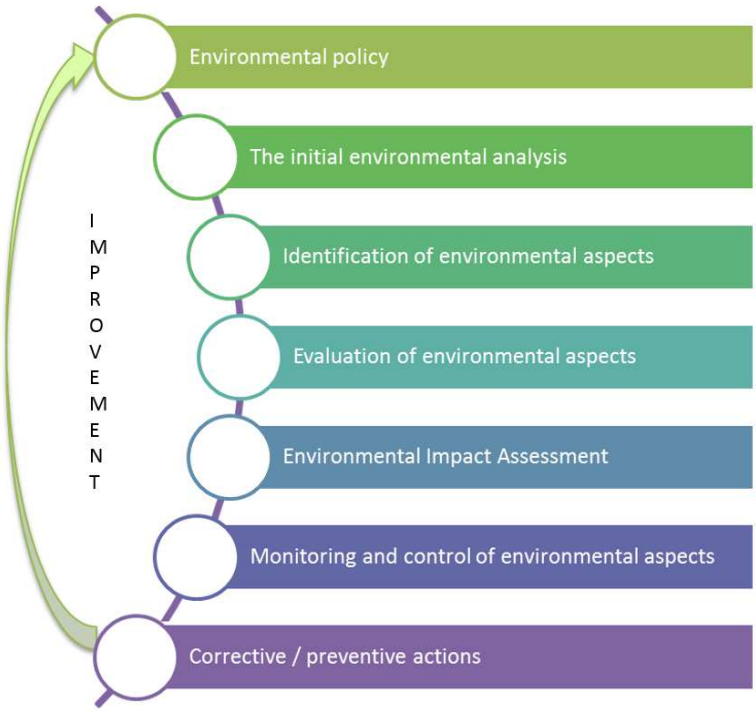

Fig. 1. Implementation methodology of environmental management processes

By implementing the environmental management it is intended to ensure the use, handling, transport and storage of dangerous substances and the carriage comply with the legally dangerous goods, both in terms of the potential hazard to the environment, as well as in terms of measures in case of emergency.

The process of identification of environmental aspects is made by analyzing all processes / services, phases, operations, activity areas, taking into account normal operating conditions, abnormal (starts, stops, overloading, maintenance, etc.) and possible emergency situation.

The main activities performed by the organization are:

- Preliminary analysis of samples in laboratories approved and recognized by the relevant authorities;
- Wastes sorting;
- Waste collection and transport in accordance with norms of environmental protection and ADR transport (European agreement on international road transport of dangerous goods);
- Cleaning services, remediation;
- Interventions in case of environmental accidents;
- Recycling, co-incineration, waste incineration depending on their category.

2.2. The collection and transport of wastes in accordance with European agreement on international road transport of dangerous goods (ADR) [5]

Road transport of dangerous goods as that achieved by rail, inland navigation and shipping and air are regulated by international agreements, EU regulations and national legislation.

Transport of dangerous goods is regulated in order to prevent possible accidents and damage to people, the environment, vehicles or goods.

Shipment of dangerous goods should be performed after an appropriate classification and packaging.

ONU regulation harmonizes the regulations type of different transport modes in a system of classification in which each substance or dangerous object is assigned to a certain class, according to the type of risk presented by the substance.

National and international road transport of dangerous goods is done in accordance with the European Agreement - ADR.

ADR establishes the dispositions applicable to classification, packaging, marking, labeling of dangerous goods. It includes also specific prescriptions on the vehicle or tank used and provisions on how to run operations loading, filling, discharging, etc.

Packaging group and the class impose together, how to be achieved: packaging (including packaging interior and exterior), suitable materials of which must be the packaging, brands and labels to be applied on these and other provisions for carrying transportation of dangerous goods safely, security and legality.

2.3. Case study

Study on the environmental impact assessment in order to ensure the efficient and effective waste management consists in achieving the following processes presented in Figure 2.

Fig. 2. Wastes management processes

The assessment process consist of periodic identification and evaluation of the environmental aspects and related significant impacts of the activities, products and services associated with the major facility operations.

Criteria for the environmental impact assessment involve defining the criteria for assessing the importance of environmental aspects of its activities, products and services, to determine which have a significant environmental impact.

An environmental aspect it is considered to have a significant impact on the environment when the score calculated by the formula:

$$P = F \cdot 2 + G \cdot 4 + C \cdot 4 + R \cdot 5 + V \cdot 2; \quad if\ P > 26 \ \rightarrow AMS \tag{1}$$

Table 1. Classification of environmental aspects

Qualitative classification	Quantitative classification
Insignificant aspect	1-26
Significant environmental aspect	26-100
Hazard environmental aspect	100-640

The environmental aspects evaluated based on equation 1 and table 1 specific to analyzed processes are graphically shown in Figure 3.

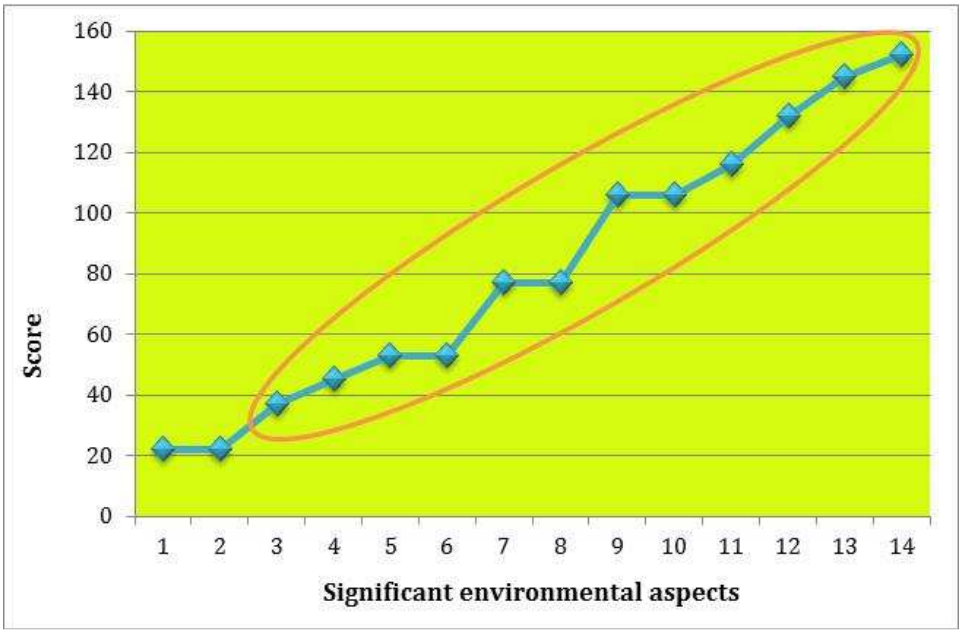

Fig. 3. Environmental aspects evaluated

The main categories of significant aspect that have a high impact on the environment are:
- Risk of leak of dangerous substances: oil, other substances;
- Waste oil generation and impregnated materials;
- Gas emissions;
- Pollution of soil;
- Work accidents with impact on the environment.

3. Conclusions

By implementing and maintaining of environmental management system, it will meet the following requirements:

- Compliance with legislation and regulations relating to environmental aspects of national and international environmental standards and any developments thereof, on their activities;
- Continuous improvement of management system;
- Prevention of pollution and environmental risks.

The organization should identify the environmental aspects of processes they perform, the products that they provide and evaluate them so as to determine whether they have or may have a significant environmental impact by implementing methods to monitor, and to control the environmental effects.

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