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Identification of environmental aspects in an EMS context: a methodological framework for the Swedish National Rail Administration

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Abstract

Environmental aspects are basic elements in an Environmental Management System (EMS). The identification of environmental aspects is, however, recognized as one of the most complicated parts in establishing an EMS and has been subject to criticism concerning, e.g., lack of transparency and reproducibility. This paper evaluates the Swedish National Rail Administration's (Banverket) current practice for the identification of environmental aspects. A better link between activity, aspect and impact is needed. A more stringent identification procedure would improve Banverket's environmental management. The paper proposes a structured framework for the identification of environmental aspects at Banverket.

Keywords: Environmental management system; Public organization; Sweden; Operation and maintenance

1. Introduction

Standardized Environmental Management Systems (EMS) were developed in the 1980–1990s when many companies demanded new management tools to be able to follow environmental legislation and to approach sustainable development [1,2]. Hence, EMS set off in a corporate context and existing theories therefore, mostly relate to trade and industry (e.g. refs. [3–5]). Today, EMS has been incorporated in many public organizations [6]. The development towards a wider application of EMS raises demands for adapted methods for assessment and monitoring.

The purpose of EMS is to provide organizations with a tool for a uniform, systematic, and structured way to achieve effective environmental management [2] by stipulating the implementation of environmental goals, policies, responsibilities and audits [1]. The international EMS standard ISO 14001 consists of a cyclic system for planning, implementing, reviewing and improving the actions that an organization undertakes to meet its environmental goals, with the overall aim of continuous environmental improvement. The basic elements in the system are the *environmental aspects* [7,8], i.e. elements in the organization's activities, services or products that can interact with the environment [9]. The environmental aspects determine the focus and scope of the EMS, and adequate identification and compilation of aspects is therefore essential [7,8]. Although environmental aspects are the foundation of EMS and a procedure for the identification of environmental aspects is required by the ISO 14001 standard [9], there are few recognized methods or guiding principles in the literature on how and how often the identification should be performed [10]. The majority of published studies of procedures for identifying environmental aspects focus on organizations in the trade and industry sector (see e.g. refs. [10–12]).

According to a declaration made by the Swedish prime minister in 1996, Sweden should be a forerunner in striving for an ecologically sustainable development. The Governmental communication, *Ecological sustainability* [13], described strategies

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for different sectors of society. One of these strategies was to implement EMS in all central Governmental authorities. As a result, the Swedish National Rail Administration, *Banverket*, initiated the implementation of EMS (ISO 14001) in 1998 [14]. Banverket operates on a national basis but is regionally organized in five relatively autonomous administrative Railway Regions (Fig. 1). All the Railway Regions work according to their own EMS.

This study seeks to increase the knowledge of the procedure of environmental aspect identification in Banverket as a large public organization in Sweden, and concerns operation and maintenance measures. Research questions were as follows: How is the identification of environmental aspects performed at Banverket? Who performs the identification in practice? How often is the identification performed? What problems have been encountered in the process? The study is part of a project with the overall aim of improving the environmental performance of Swedish rail's operation and maintenance.

The main objective of this paper is to analyze the current practice in EMS, with special focus on ISO 14001, for the identification of environmental aspects pertaining to operation and maintenance at the administrative Railway Regions of Banverket. A secondary objective is to propose a framework for the identification of environmental aspects at Banverket.

Fig. 1. The five administrative Railway Regions of Banverket [52].

2. Methods

General characteristics and difficulties working with the environmental aspects at Banverket were identified by means of a qualitative approach. A combination of methods was used in the research, i.e. a questionnaire survey, interviews and participating observations. The questionnaire, comprising both quantitative and qualitative questions, was prepared to explore the method used for environmental aspect identification at Banverket, the type of aspects identified, the composition and competence of the group performing the identification, and the kind of problems encountered in the process. The questionnaire was sent to the administrative Railway Regions of Banverket. It was directed to the staff members at all administrative units that take part in the process of identifying environmental aspects. A total of 19 people received the questionnaire. In the Western Railway Region, however, organizational changes were underway within the EMS group and only the environmental coordinator replied to the questionnaire. A total of 12 responses were received during the autumn of 2004.

Representatives from the Department of Environment and the Department of Maintenance at the Head Office of Banverket as well as the environmental coordinators from the Railway Regions took part in the interviews. From January 2004 to February 2005, a total of nine people were interviewed. Unstructured interviews (cf. ref. [15]), designed to collect qualitative information from a small-sized sample, were used. Issues dealt with in the interviews included:

- Current procedure for the identification of environmental aspects at the Railway Region;
- Main problems encountered in the identification of environmental aspects.

The interviews were performed in combination with participating observations as recommended by Merriam [16], conducted through attending internal meetings at the Railway Regions dealing with the implementation and operation of EMS. Environmental audits at the Southern and Central Region, as well as three of the Environmental Councils, were also attended. The councils are arranged two to three times a year and the participants are the environmental coordinators from the Railway Regions, as well as representatives from the Head Office. The overall environmental management at Banverket is coordinated through these environmental councils.

3. Management by objectives

The main assignment of the Swedish central governmental authorities is to implement the decisions made by the Parliament and the Government [17]. The authorities are autonomous in the sense that they act on their own responsibility but in accordance with guidelines and objectives laid down by the Government. Banverket has the overarching sectoral responsibility for the Swedish state railway network [18]. This implies that besides operating the rail infrastructure, Banverket should support and encourage the rail sector's