The Construction of Green Supply Chain Management System

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ABSTRACT

Considering the implications of EU environmental laws such as REACH (registration, evaluation, authorization, and restriction of chemicals) and EuP (directive on eco-design of energy-using products) as well as RoHS (restrictions of the use of certain hazardous substances in electrical and electronic equipment) Directive, they have been acquired to advance GSCM (green supply chain management) more and more. The aim of this article is to introduce the construction of GSCM system that improves collaborative relationships between an EEE manufacturer and its suppliers. The study is conducted in three steps. Firstly, the four elements, which are necessities to form collaborative relationships between an EEE manufacturer and its suppliers, are described. Secondly, the condition and construction of GSCM system including the four elements is proposed. Finally, we presented the method that the GSCM system is constructed as a practicable tool in the initial stage by a case study held in Shimadzu Corporation.

Keywords: electrical and electronic equipment; electrical and electronic equipment manufacturers; environmental management system; green supply chain management; GSCM policy and purpose; joint action; RoHS directive

INTRODUCTION

The RoHS (restrictions of the use of certain hazardous substances in electrical and electronic equipment) has driven the implementation and development of GSCM (green supply chain management) for Japanese EEE manufacturers who produce EEE products that are exported to the EU market. The EEE manufacturers have pressed their parts suppliers to participate in various activities for compliance with the directive and for meeting the demands of EU market. The three common environmental activities are; (1) obtaining certification of EMS (environmental management system), (2) sharing knowledge of substances...
presence in EEE parts, and (3) warranting RoHS substances not included in EEE parts. However, the activities are likely to have been promoted without suppliers’ sufficient acknowledgement and abilities. Moreover, many Japanese parts suppliers do not directly face with EU market. It is necessary that the demands of an EEE manufacturer to its suppliers should be balanced with suppliers’ capacities for an effective advancement of the GSCM. The suppliers’ capacities for complying with EEE manufacturer’s demand depends on their acknowledgement on RoHS directive and environmental problems, financial status, technical and human resources. Therefore, the EEE manufacturers have been faced with the fact that they must form collaborative relationships between the EEE manufacturer and the parts supplier to improve GSCM performance.

This research presents the construction of GSCM system to promote collaborative relationships between an EEE manufacturer and its parts suppliers. The GSCM system is also a standard to organize and systemically operate environmental activities. In this article, we described the construction of the GSCM system including the four elements to form collaboration and introduced the method to apply the GSCM at the initial stage in the case study of Shimadzu Corporation.

**THE FOUR ELEMENTS FOR FORMING COLLABORATIVE RELATIONSHIPS**

To correspond to environmental problems related to end products, EEE manufacturers implement GSCM for the next three stages. To improve environmental problems related to the product, EEE manufacturers set the GSCM policy and purpose as the first stage. Then EEE manufacturers set the environmental requirement based on the GSCM policy and purpose as a second stage. As the third stage, EEE manufacturers promote the supplier's cooperation to cope with the environmental requirement in the GSCM implementation. Here, to promote the cooperation of the supplier in the GSCM implementation, EEE manufacturers need to share the GSCM policy and purpose with parts suppliers in the second stage. Moreover, EEE manufacturers are requested to advance joint action with the supplier up to the second stage and the third stage. To advance sharing the GSCM

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**Figure 1. Elements for forming collaborative relationships**

![Diagram showing the four elements for forming collaborative relationships between an EEE manufacturer and parts supplier. The elements are: Sharing GSCM policy and purpose, Joint action, Sharing knowledge and information, and Activities for supplier support.]

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