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# Specifications and supplier development in the UK electrical transmission and distribution equipment industry

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**Abstract**

Specifications have a large impact upon capital and operating costs because they are formulated early in the design process. Models of the specification process have been developed for the automotive industry. These models have many shortcomings and have limited application in other sectors. This paper examines the development and use of specifications relating to customised plant for the electricity supply industry.

Two case studies are presented that examine the specification process at the National Grid Company (NGC) and SupplierCo, one of its strategic suppliers. Functional models are developed to explore the application and use of specifications. Previous research suggests that there is a choice between functional or technical specifications. This research found that functional specifications were used for each contract, but these were applied within a detailed framework of technical specifications. NGC has developed a supplier development programme that aims to improve the capability of its supply chains within its framework of specifications. NGC's use of specifications enables it to effectively meet the requirements of The Office of Gas and Electricity Markets (OFGEM) and its shareholders.


*Keywords:* Specifications; Electricity supply; Capital goods; Supplier development

## 1. Introduction

In the management of major projects one of the principal objectives of the contract strategy is to minimise technical and commercial risk. The customer needs to be confident that the supplier has the necessary capabilities to satisfy the terms and conditions of the contract. The cost to the client of failure by the contractor may be many times greater than any compensation that could be recovered through legal action. A contract requires safeguards and incentives that protect the interests

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of both the client and the supplier. The specification plays an important role in reconciling these conflicting interests.

Each piece of plant that is the subject of a tender and eventually a contract requires its own specification to complement the conditions of the contract. Specifications are written for two main purposes: (i) to state the requirements concerning the performance and technical attributes of a product; (ii) to give guidance on the process of making and using a product (BS7373, 1998). The specification may contain the technical requirements, project management, quality assurance and process requirements, performance standards, contract conditions, and commercial aspects of the contract.

An understanding of the specification process is important for management in terms of managing product development, integrating knowledge, controlling costs and lead-times, and meeting customer requirements. Despite its importance, research into specification management has largely been neglected. The limited research that has been conducted to-date has focused largely on the high-volume automotive industry. Little research, however, has been conducted into the management of specifications in the low-volume capital goods sector. Capital goods companies produce high-value products that are used in industry to produce other products. Examples include boilers, turbines and switchgear for the electricity supply industry. Individual products are generally highly customised to meet individual customer requirements. The design content per order is usually high. This makes specifications particularly important because product requirements are contract and customer specific.

The purpose of this paper is to explore the application of specifications in the UK electrical transmission and distribution equipment industry. The work is based upon case studies at the National Grid Company and SupplierCo, one of its strategic suppliers.

The objectives of this paper are to:

- describe and define various types of specification;
- review models of the specification process;
- investigate the relationship between specifications, supply chain management and supplier development in the electricity supply industry;
- model the internal processes involving to the use of specifications by SupplierCo, a company that supplies switchgear to the National Grid Company.

The next section begins by describing and defining different types of specification. Various models of the specification process are then explored. These are mainly concerned with the high-volume automotive sector. Specifications are then considered within the context of supply chain management and supplier development initiatives. Section three describes the research methodology. The use of the Structured Systems Analysis and Design Methodology (SSADM) is outlined. Sections 4 and 5 describe in-depth case studies that were conducted at the National Grid Company (NGC) and SupplierCo, one of its strategic suppliers. These are followed by discussions and conclusions.

## 2. Specifications

A specification has been defined as "a written description of a product that is generated beforehand to guide the development of the product" (Smith and Reinertsen, 1991, p. 81). This is a narrow-based definition and involves one-way communication between the customer and the supplier. A broader definition of a specification has also been offered which views the specification as a "forum for dialogue" (Nellore and Soderquist, 2000, p. 529) where the suppliers are involved in the specification process.

A specification is ultimately about ends—the delivery of a product, project or service. The formulation of an appropriate specification is vital to achieving these objectives (Walsh et al., 1992). Identifying customer requirements forms the basis of the performance specification, commonly known as the functional specification. The performance specification "specifies requirements in terms of features, characteristics, process conditions, limits and exclusions defining the perfor-