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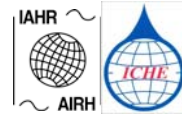
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ISO 9000 QUALITY MANAGEMENT SYSTEM – ITS AWARENESS AND APPLICATION TO IMPROVE QUALITY IN CONSTRUCTION INDUSTRY IN INDIA

Sudhir Bhatt¹, Rajeev Chandak² and Prakash Verma³

Abstract: ISO 9000 quality management systems standards developed by the International Organization for Standardization (ISO), has not been popularly and effectively in use in the construction industry in India. Despite the growing infrastructural requirement of the country the quality management system is not being implemented in the construction industry. The clients are very much quality conscience, and quality is essentially a prime concern for them in their construction projects. Most of the clients require that their contractors must have a quality management system (QMS) like ISO 9000 or ISO 9001 certification or otherwise they would also prefer to voluntarily implement the ISO 9000 based QMS in their organization. This may entail various benefits to clients and contractors and its application would result in an improved quality product. In developing countries like India the economy is rapidly moving forward and more emphasis is given to the infrastructural development. But the use of ISO 9000 based QMS, by the contractor firms in construction industry has yet not been studied from the perspective of what benefits the Indian construction industries involving civil engineering construction works in dam, hydropower, bridges, buildings, real estate development, etc., can get by implementing the Quality Management System. This paper is aimed at review of broad studies carried out at Turkey on its awareness in the construction industry amongst the contractor firms. A field study through a Questionnaire Survey was done and the data was evaluated to assess how its application is beneficial to the construction industry in increasing the productivity, improvement in quality of product, better service and best customer satisfaction.

Keywords: ISO 9000; Quality management system (QMS); Construction Industry; Contractor Firms;

INTRODUCTION

India is a developing country and for its infrastructure development it is receiving about millions of Rupees as a foreign aid by the International Financial Institutes. The foreign investment is also being allowed by the Government in the construction works in dams, hydropower projects, bridges, buildings and in real estate development sectors. The contractor

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firms largely engaged in construction industries are not using ISO 9001 based QMS and may therefore not be meeting with the desired quality standards.

In the construction industry, quality is defined as meeting the requirements of the designer, the contractor, the regulatory agencies and the project owner (Arditi D, Gunaydin HM, 1997). The best utilization of money can only be made by effective expenditure and optimization of the resources available. For better resource planning, effective monitoring of the project, better control and improved employee efficiency there is a requirement of implementation of some quality management system. An international system of certification like ISO 9000/9001 would offer a variety of benefits to the construction industry in respect of savings in the costs of projects by its timely completion owing to better management.

This will not only streamline the operations and enhance the productivity but would also result in improving profit margins through superior processes and efficient system thereby increasing customer/client satisfaction. However, growing interest has been paid to the use of this system in the construction firms of foreign countries but its use has not been sufficiently studied from the perspective of developing country like India.

Quality is an essential element for sustainability and customer satisfaction. In construction projects, quality performance of contractors is considered as vital for client satisfaction (E. Palaneeswaran, Thomas Ng, Mohan Kumarswami - 2006). Various quality performance focused initiatives have been considered by clients and contractors both e.g. balanced scorecard, business excellence model, ISO 9000, ISO 14000, OHSAS 18001, six sigma, and total quality management systems. Amongst such quality initiatives, ISO 9000 quality standards related to construction are popular in several countries and the application of ISO 9000-based QMS in the construction industry has been studied by several researchers e.g. Love and Li in Australia; Serpell in Chile; and many others.

It has been found that ISO-9000 based QMS have been adopted by the contractors mainly due to the mandatory requirements placed by the clients or having anticipated the reduction of rework and wastages, improvements in documentation or as a good marketing tool. Whether the implementation of ISO-9000 based QMS could effectively improve the quality of products and benefit the contractors and clients is yet to be examined in detail in perspective of India.

The implementation of QMS is based on the needs and objectives of the organization. It is dependent on the type of product and the processes it has employed. The QMS may be adopted by those organizations that are committed to quality and have ability to meet customers' statutory and regulatory requirements of quality product. Their size should be good and they should be ready to withstand the risks associated with the environmental changes owing to change in the organizational structure.

The top management of organization should have conviction that this QMS should be applied with sincerity and faith and ISO certification is not for a decorative purpose but for improving the working and efficiency of the system to enhance the customer satisfaction with a quality product. Quality Management System properly implemented will have manifold

advantages. It gives enhanced consistency and better image to the organization and helps in reducing the wastage, rework and cost of the structure. Also this would result in reducing the disputes and claims against the construction firms. However it is worthwhile to mention here that the QMS does not give any guarantee that the services provided by the ISO certified organization is better and good in quality as compared to others but it can surely be presumed that products being processed through a well designed quality management system and having passed the stringent norms and checks may prove to be much better than those of others and will provide better customer satisfaction.

The study of application of ISO-9000/ 9001 based QMS in construction industries in perspective of India will be useful because it is a major economic activity and it is receiving a huge sum of foreign aid for the infrastructural development of the country. It has a wide employment potential and helps in solving the unemployment problem to large extent. Since this investment is a fixed capital investment, it is related to growth of the national Economy as well. The quality requirement in construction is most essential and must be given top priority as most of the states of India are prone to earthquake and the quality compromise may cause a substantial damage and irrecoverable loss to life and property. The use of modern technology and adoptions to the systems of the developed countries will increase the quality of construction and may strengthen the position of the construction industry in the world market.

WHAT IS ISO 9000

To establish a quality system in any organization and to meet the requirements and demonstrate quality assurance of products or services to the customers and the outside world a series of internationally accepted standards which are adopted are called ISO 9000 standards. It is a means to demonstrate the organization's commitment and total organizational involvement in quality. (ISO 9000 & Quality (Revised), AIIMS– Madras)

ISO 9001:2008 IN GLOBAL SCENARIO

ISO is the certification standards and an organization obtains accreditation to it. A company needs to comply with all the 20 requirements in all the activities to provide quality assurance in their business. It is the world's largest developer of voluntary International Standards for business, government and society. It comprises of about more than 18000 standards and of these the most well known and widely implemented ISO quality management and environmental management system are ISO 9001 and ISO 14001 respectively. They are worldwide being used by small and large business organizations in public and private sectors by manufacturers and service providers in all sectors of activities (ISO Survey–2008).

The standards are implemented by some of the organizations without certification for the benefits which the organizations can achieve for themselves and customers as well. However the organizations prefer to go for the certification with a perception that independent confirmation of conformity adds value.

As per the Nielsen Company (ISO Survey-2008), Austria a market research firm survey up to the end of December 2008, at least 982 832 ISO 9001:2000 certificates had been issued in 176 countries and economies (Table-1, Fig.-1). The 2008 total represents an increase of 31 346 (+ 3%) over 2007, when the total was 951 486 in 175 countries and economies (Table-1, Fig.-2). The total includes ISO 9001:2000 and ISO 9001:2008 certificates, which have been cumulated because ISO 9001:2008, which was published on 15 November 2008, contains no new requirements compared with the older 2000 edition which it replaced.

Table – 1
ISO 9001:2000/2008 Principal Results

| World Results | Dec.2004 | Dec.2005 | Dec.2006 | Dec.2007 | Dec.2008 |
|-----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| World Total | 660132 | 773867 | 896929 | 951486 | 982832 |
| World Growth | 162213 | 113735 | 123062 | 54557 | 31346 |
| No. of Countries/economies | 154 | 161 | 170 | 175 | 176 |

Source: Nielsen Company, Austria (ISO Survey – 2008).

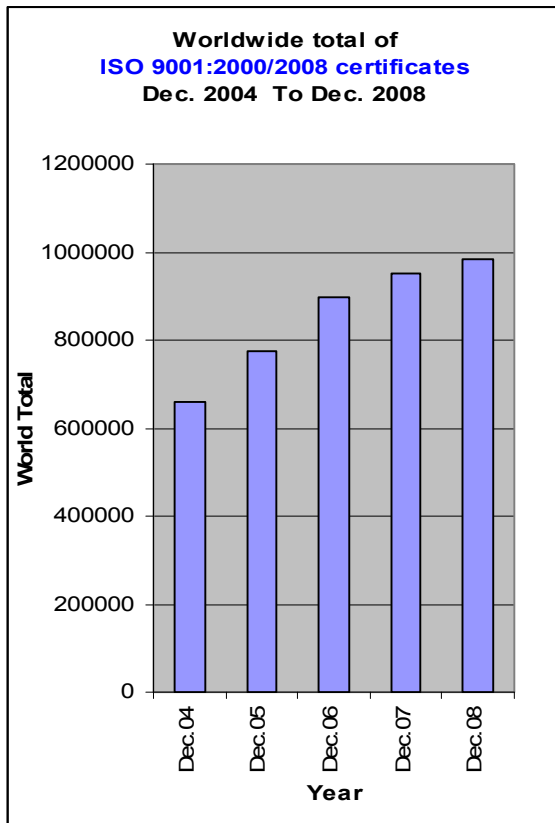


Fig. -1

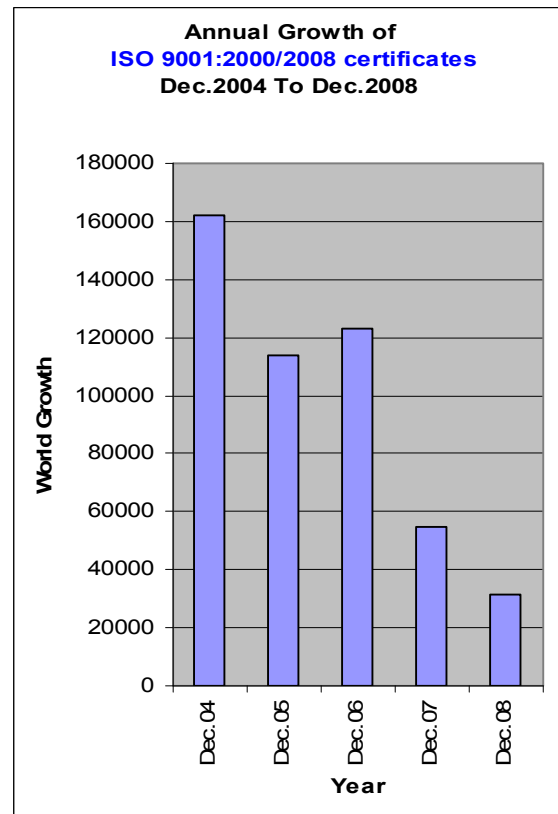


Fig. - 2

Source: Nielsen Company, Austria (ISO Survey – 2008).

In India the growth in ISO 9001:2000/2008 certification is found to be increasing and is shown in Table-2, Fig.-3 & 4 however a declining value is observed in the year 2008.

Table -2

ISO 9001:2000/2008 Certifications Growth in India

| Country | Dec.2004 | Dec.2005 | Dec.2006 | Dec.2007 | Dec.2008 |
|---------|----------|----------|----------|----------|----------|
| India | 12558 | 24660 | 40967 | 46091 | 37958 |

Source: Nielsen Company, Austria (ISO Survey – 2008)

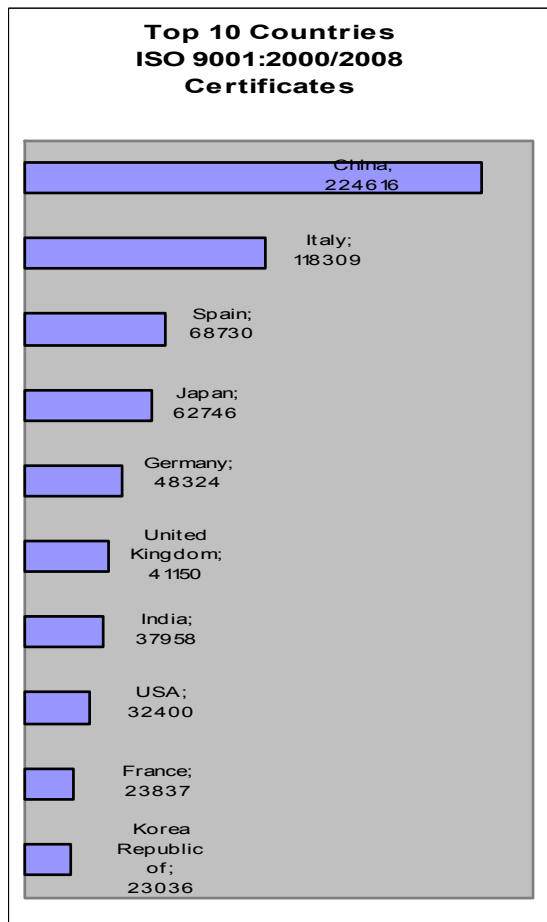


Fig. - 3

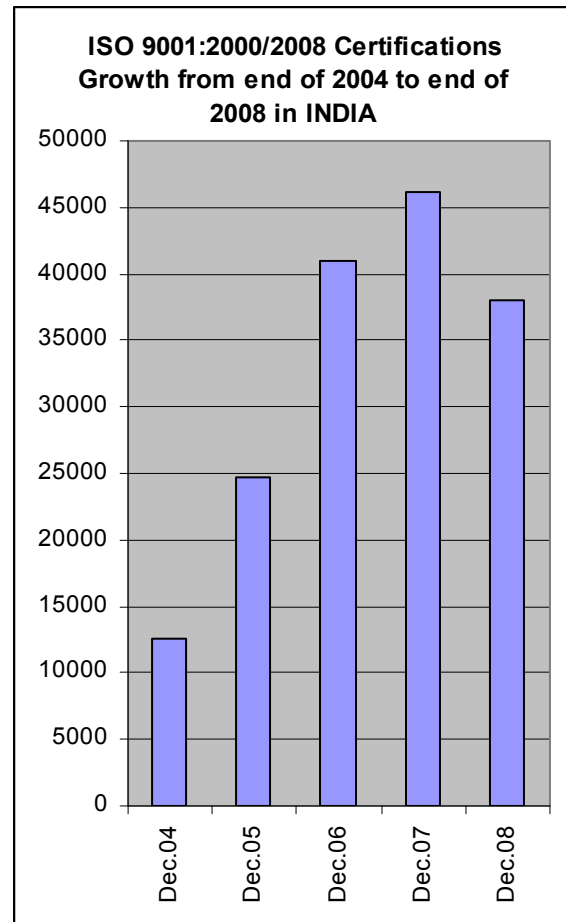


Fig. - 4

Source: Nielsen Company, Austria (ISO Survey – 2008).

ISO 9001:2008 IN THE CONSTRUCTION INDUSTRY

The system is in use by the various other industries since 1987 in the world and is widely accepted in the global construction industries also. This industry has a share of about 9% of total number of ISO 9001:2000 certificates granted throughout the world up to the end of 2003 (ISO Survey 2004). This system has an environment in which employees participate and fulfill customers' requirements to enhance customer satisfaction. The decisions are taken on factual basis and in house remedial measures are taken using a systematic management approach.

The implementation of this system in construction industry is unique unlike other industries as the services provided and the products are non repetitive. They have a unique design and construction process and sequences and modules to each project as an individual. These projects are also affected by various local, social and environmental factors. Looking to these aspects it was thought to be found difficult to put in to practice the QMS standards because of the fear in mind that due to the diversity of the processes involved in the construction and the requirement to produce a different product or services for each project it may not produce good results. Although, it will increase the competition and may be an appropriate tool for the firms to work efficiently and more effectively, it can be certainly be considered useful for producing quality product by impeding the repetition of faults and avoiding shortcomings. Ideally its certification by the construction firms will help in optimizing the firms resources, improving the in house quality procedures and better customer satisfaction.

To study the awareness of ISO 9000 QMS amongst the Turkish construction firms a Questionnaire survey was carried out and the results were analyzed by A.M. Turk (2005). In total, 138 construction firms who were members of Turkish Contractors Association (TCA) and representing the top level firms operating both in Turkey and in the international market were selected for the study.

The construction firms were given a Questionnaire on QMS, for providing their views in regard to their perceptions, advantages/disadvantages, and experiences, difficulties in its certification process and in its implementation. The data was then evaluated by statistical methods by applying T-test and chi square independence test to test the hypothesis and to find out whether ISO 9000 QMS is an appropriate tool for construction firms or not.

From the literature review and on the basis of results obtained through Questionnaire survey which was carried out in Turkey to study the awareness of ISO 9000 QMS in construction firms (A.M. Turk, 2006) this has been concluded that:

- i) The ISO 9000 QMS is found to be an appropriate tool for construction firms and they have a positive effect on the quality of work.
- ii) The size of the firms and their award of contracts in the international market do not perceived to be found to have any relation by the construction firms.
- iii) Some of the construction firms have an opinion that in future the ISO 9000 QMS certification may become mandatory for bidding in international market and therefore has to be attained for the purpose of entry for tendering process.

The advantages of ISO 9000 certification are:

- i) On implementation of ISO 9000 QMS in the construction firms they have built image in the market and companies became able to have better communication with the customers
- ii) The responsibilities can be defined in a broader way and they can be shared between the employees in more efficient way.
- iii) The more efficient operating procedure and tighter control over the sub contractor resulted in improved quality of the product.
- iv) The construction firms strengthened the competitive power and have started having convenience in contracting project.

The difficulties and the disadvantages of ISO 9000 certification are:

- i) Nearly half of the Turkish surveyed firms stated that having ISO 9000 QMS certification does not increase their business volume.
- ii) The most important disadvantage is the increase in documentation which corroborates with the similar results obtained in other studies in the international literature.
- iii) The personnel system is required to be restructured to establish QMS.
- iv) The registration process takes time and is too lengthy. This has also added to the expenses.

AWARENESS OF ISO 9000 QMS IN INDIAN CONSTRUCTION INDUSTRY

To study the awareness, experiences, perception and views and opinions about ISO 9000 QMS, a Questionnaire pilot survey is being carried out amongst the Indian construction industries. To collect the information from all categories of construction firms, the construction companies irrespective of its certification for ISO 9000, belonging to smaller cities to metropolitan cities are selected.

In this attempt, a Questionnaire, in consideration to available literature is prepared by the authors and has been sent through e-mail to about 30 companies of Jabalpur, Bhopal, Indore cities of Madhya Pradesh, Delhi, Pune, Thane, Bangalore, and Mumbai for providing information about the profile of the companies and their views and opinions about the certification and application of QMS under various sections. The response from them has not been found to be encouraging and the information will be collected by personal efforts. However the efforts are also on to broaden the area of survey to have more number of companies for study and to have replies from them for the purpose of analysis in Indian context. The following observations are made:

- i) The data in regard to total number of ISO 9000/9001 certification under all categories in India is also not found to be available in a consolidated manner with any of the sole agency.
- ii) The data for total number of ISO 9000/9001 certification in **construction firms** of India is also not found to be available with any of the sole agency.

- iii) The Nielsen Survey report 2008 only indicates the growth of ISO 9001:2000/2008 certificates in India and the number up till now for certification is found to be 37958 for the year 2008 in India. The category wise certification detail is not available.
- iv) The ISO Annual Report 2008 also does not contain detailed country wise information of certifications.
- v) The category wise details of total number of certifications of ISO 9000/9001 are not available with the regional offices of certification bodies also.
- vi) The Indian Contractors' Association does not have offices in all the states and by enquiry it has been found that barring metro cities not much of construction companies are members of such type of association.

CONCLUSIONS

In view of the available literature and its review the following suggestions are given for improving the awareness and the effective application of ISO 9000 QMS in construction firms of India.

- i) Looking to the low awareness of ISO 9000 QMS in construction industry, an awareness campaigns should be organized by the certification bodies in different cities in association with the leading certified contractor firms to appraise the advantages of ISO QMS implementation in construction companies.
- ii) The ISO 9000 certified auditors should help and guide the organizations to implement the QMS in the construction firms in its right earnest by sticking to the procedure laid down by them in its quality manual.
- iii) Stringent inspections by a consortium of experts of different fields from certification bodies should be carried out to insist the organizations to follow the QMS for continual improvement in the quality of the product.
- iv) Effectiveness of the QMS in construction firms should also be assessed by the auditors to improve upon the quality of work to minimize the rework, wastage and disputes and to have the best client satisfaction.
- v) The government may also take initiative to promote the construction companies to go for ISO certification for implementation of QMS in construction and also may offer some incentives to such companies.
- vi) The ISO certification should be made mandatory for award of contract to construction firms for the works having certain values as deemed fit.
- vii) A quality control cell and appointment of quality control engineer should be made compulsory for the construction firms after a certain value of contract.
- viii) The sub contractors who are rendering services to the main contractors should also be encouraged to go for ISO certification so as to improve upon the quality of construction.
- ix) A more transparent QMS in construction firms should be applied and the clients should also be allowed to have access to verify the quality of work.
- x) The client/customer satisfaction survey should be carried out by an approved independent body under the control and supervision of certification bodies.

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