

Analyzing and Evaluation of Quality Management System in Bandar Imam Petrochemical Company (BIPC)

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Abstract

In holistic manner the petrochemical industry in Iran growth rapidly and targeted the internal and external market. Beside of its huge effect on social and environment, sustainable development and life time management is necessity for this industry to growth and exist In light of increasing pressure from internal /external stakeholders implementation/ certification of quality management systems has been a challenge and major activity for any organizations The diffusion of Quality management system in petrochemical industry in Iran is very high, so analyzing of such system is a key to find out the process of merging of traditional management system with new system and challenges between this two concepts. This research implements the background to find out how much systemic approach is successful to penetrate in traditional behavior of organization and if not, what are the reasons. The research is based on case-study approach and it is in alignment with the scope and benefits expected from this methodology.

Keywords

ISO 9001, Iran, Petrochemical industry.

Literature review

summery of literature review on constitute quality management practices show obviously that such factors as customer focus, quality leadership, supplier involvement, and more importantly human resource management practices such as empowerment, involvement, training and education are common factors on quality management practices Yousef et al. (2006)

Schuurman (1997) about quality management practices says:

Quality management practices may be defined as techniques for achieving objectives related to both consumer satisfaction and continuous improvement. In general, quality management practices optimize the efficiency and effectiveness of a production system while traditional management practices are usually only concerned with maximizing the efficiency of the production system. Therefore, the principal difference between the two management approaches is that quality management practices aim to internalize the concept of consumer satisfaction in the different activities of the organization. This has resulted in different ways of organizing the production system and the application of different technologies. Well-defined and communicated policies and strategies are the formalization of such management commitment.

Focus after certification

Gotzamani et al. (2007) about the elements that should be focus on them after certification said:

The efforts should focus on the “soft” elements of TQM (leadership, employee participation and empowerment and customer relations). Improvements in these elements are particularly important, since there is adequate research (Samson and Terziovsi 1999; Ahire et al. 1996; Powell, 1995) as ISO 9001 certification and benchmarking. The “soft” enablers of TQM and excellence (leadership, management involvement, human resource management and customer focus) have a higher influence on performance improvement than do the “hard” ones (the more systems and analytic-oriented factors of information and

analysis, process analysis and strategic planning). The results of a survey in Asia/South Pacific, Europe and North America found that from a number of different approaches to quality, the major factors that influence actual quality were the organization's knowledge of quality management, its degree of customer focus, and management involvement (Adam et al., 1997).

(Non-financial) Auditing

Mills (1989) considers that the quality audit provides the client with an independent assessment of conformance and the effectiveness of the organization's operating systems against predefined standards. He also contrasts the differing focus of internal and external audits. The internal audit evaluates conformance to the organization's operating procedures, and the effectiveness of these procedures, while the external audit determines conformance to some predefined standard as established by the certifying body (such as ISO 9000 series). Mills also notes that one of the major problems confronting auditors is that of maintaining consistency in the interpretation of the standards between differing sizes and types of organizations. Ingman (1991) takes the view that the quality audit should be used as a means of strengthening the quality system by removing barriers that may impede the continuous improvement process. Rather than a bureaucratic process he sees it as a tool that can be used specifically to remove what he describes as ...bureaucratic encumbrance, the cancer of any quality system. To facilitate this he believes the use of feedback and involvement of all parties is essential.

The research that done by Terziovski in Australia were 300 non financial auditors (response rate 42%) and 1500 companies (response rate 27%) surveyed was found that:

Managers are beginning to see the value of the management systems approach to running a business i.e. institutionalizing best practices that are derived through Continuous Improvement processes. The fact that almost 75% of organizations surveyed indicated ISO certification had contributed positively to improved business performance needs to be balanced against the fact that 60% of the sample have developed mature quality cultures. The primary implication for managers of these organizations appears to be how ISO certification can meet their evolving requirements. For example, combining the discipline of the ISO 9001-2000 compliant system with the significant process improvements that are derived from programs such as Six Sigma and cycle-time reduction could facilitate rapid process improvements that become the best practices on which to build future organizational success. The ability of the new standard to capture and meet these requirements will be a prime determinant of the extent to which managers embrace or reject it [14, 15].

Research that done by Magd et al. (2003) in Saudi Arabia is about investigate ISO 9000 implementation in manufacturing companies. The most important advantages that emerge from this study are:

- enhancing the quality awareness
- increased efficiency of the quality system
- better customer service and more costumer focus
- employ ISO as a fostering tool
- improved product, quality and supplier relationship (Magd et al. 2003)

Table 1: ISO 9000 benefits ranked and categorized by factor analyze (ascending). Source: Magd et al. (2003)

Category	ISO 9000 ranked benefits (ascending)
Internal benefits	Improved staff motivation
	Improved customer service
	Increased quality awareness within the firm
	Improved efficiency of the quality system
Marketing benefits	Maintained/gained market share
	Increase exports
Efficiency benefits	Improved speed of good delivery
	Reduced costs
	Improved supplier relations
Inspection benefits	Improved inspection methods and time to produce finished goods
	Improved inspection methods and time to receive incoming materials
Quality benefits	Reduce defect and wastage rates

The other study that done by Casadesus et al. (2005) analysis the evolution of ISO 9000 benefits over time, the study based on an a survey carried out in 399 companies registered in Catalonia (Spain), the study evaluates the result of ISO 9000 implementation in those companies.

- The huge numbers of the respondents believe that the standard had no impact on business effectiveness for example logistics price, lead time, sales per personnel, profit (ROI).
- Most of firms reported decreasing of nonconformists (70 percent) customer satisfaction (66 percent), health and safety at work place (60 percent).
- Finally 10 per cent of firms simply say that the standard does not make a difference Casadesus et al. (2005).

Furthermore, the implementation of ISO 9001:2000 hasn't been seen problematic or caused to loss of competitiveness (Casadesus et al. 2000). It seems that the subsequent effects of the ISO9001:2000 standard were very positive, but by external factors. For example market expanding, or saving existed contract that seemed to be more important motive for implementation than internal factor such as product improvement.

According to Ivanovic´ et al. development of process management followed through five phases:

- The first phase represents the level when the process achieves the capability to produce the product, but the performances (time, quality, deadlines and costs) are not controllable and it is, therefore, defined as a black box. At this level results achieved are mainly worse than planned.
- At the second development level, with historical data in view, it is possible to predict process performances. From the control transparency aspect, the process is demonstrated as a series of black boxes, while it may be said that the effectiveness has been achieved for process performances predictability, although not for efficiency.
- At the third maturity level the process (organization) is completely defined, so from the transparency view the process is fully structured. There is increased probability for achievement of process performances.
- At the fourth level the process becomes quantitatively controllable, i.e. the process is measured in all its phases. The process is fully predictable, meaning that the capability for its complete control has been achieved.
- As in previously described four development levels the predictions have been created for the achievement of continuing process (organization) development capability, passing to the fifth level is possible.
- At fifth level the management finds conditions (based on realistic data) for further improvement, that is, the optimization of applied quality management model [8].

Figure 1: Process management development [8]

Research methodology

The research is based on case-study approach and it is in alignment with the scope and benefits expected from this methodology. In addition to finding answers or clarifying ambiguous or uncertain issues, the exploratory case

studies also help to limit research topic or field. Another advantage accompanied by case-studies is that its results can be coupled easily with explanatory and descriptive methods. In Yin's (1994:12) point of view, the case studies try to uncover the answers to "a decision or a set of decisions for example why they were taken, implemented and with what result". The company involved in this study was selected based on previous contacts with the managers from the company. After re-establishing contact with the relevant managers and informing them of the objectives of the study, interviews were arranged to be conducted on-site. Data collecting methods that have been used: participant observation, archival sources of records/ data and interviewing Bryman (1989). We collected data for three years that its arrangement is according to: one year before taking certification, the year of taking certification and one year after taking certification.

Research limitation

Quality management system based on ISO9001 has large diffusion in all aspects of business such as service, production, and electronics, civil and so on. This study has been limited to the petrochemical industry of Iran and in the one of BIPC (BANDAR IMAM PEROCHIMICAL COMPANY) subsidiaries that the latest is one of the biggest complex petrochemical companies in south west of Iran. All of the data have been used in this research related to its name is confidential.

Research Objectives

By gathering data from literature of QMS in the world and comparing it with the target case study in this thesis try to investigate the key role of QMS in business performance of the petrochemical industry in Iran and analyzing the factors that help implementation and coming in practice of QMS based on ISO 9001 in the organization. Also to find what are the benefits and effect of implementation ISO 9001 and if the results are not tangible what are the reasons and remedies.

Results and analysis

Through analyzing the quantitative results the findings are:

- Decrease in nonconformity of products
- Production reduction
- Energy/utility consumption reduction
- Production waste reduction

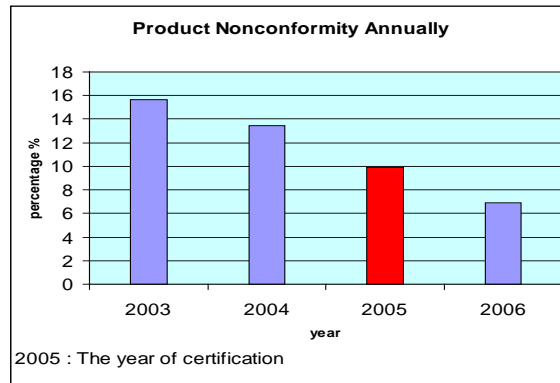


Figure 2: Product nonconformity annually

Although the products waste rate decreased annually except year 2005 (Figures 2 and 3) but products waste rate is very high regard to design at least 2.5 times greater than product design in best condition. This shows performance in products waste but its long way to receive to products design waste. Also the core activity of this company is production, but the production rate decreases annually. The most highlighted problems of production reduction are:

- Maintenance process problems
- Process technical limitation factors includes :catalyst ,reactor, heat exchangers problems

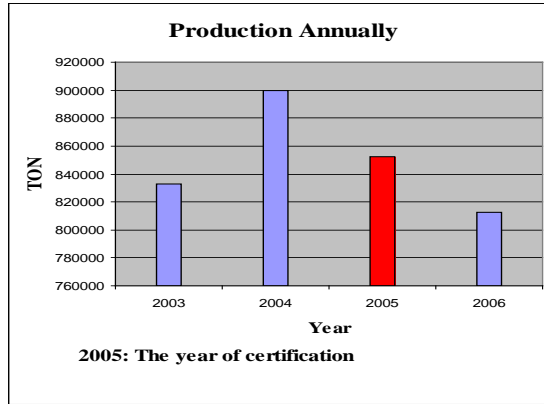


Figure 3: Production annually

The maintenance process improvement factors did not identify and analyze to determine maintenance process effectiveness. Maintenance process is to be given to maintenance contractor. The PM (Preventive maintenance) and CM (Condition monitoring of rotary equipment) processes are given to same contractor so this cause to low performance maintenance. The maintenance contractor to be selected through bidding process base on low price so the other qualitative aspects as per as ISO standard are neglected. For instance the skills, experience of contractor personnel are neglected (ISO90001:2000, 6.2.1, 6.2.2) and only the supervision tools are in place that confirmed that it's not effective tools through experiences of past years. There is Lack of communication and job definition in the margin (between process and organization chart). The organizational chart not covered al aspect of processes base on ISO 9001 due to lack of communication, hierarchical organization system and no well job description. in the other word the RAM (Responsibility Assign Matrix) not defined for linked between OBS (Organizational breakdown structure) and WBS (Work break down structure) (PMBOK ,2000) [1] or responsibility of each department regard to each processes not correctly defined in some cases , so the organization work is task oriented not process oriented.

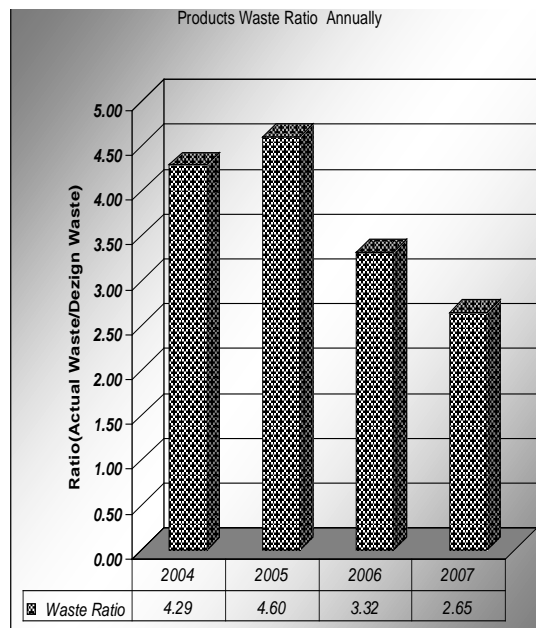


Figure 4: Products waste ratio annually

Organization culture

The team work approach not existed and not supported by management. The problem solving is based on individual's skills no systematic process of problem solving and team work. In the organization structure field no balance between job description and common practice and activity, hierarchical organization structure, weak control system, weak process orientation exist and affect the system performance. In the people field lack of technically skilled personnel, lack of team work skills, lack of communication and lack of cooperation affect the system performance.

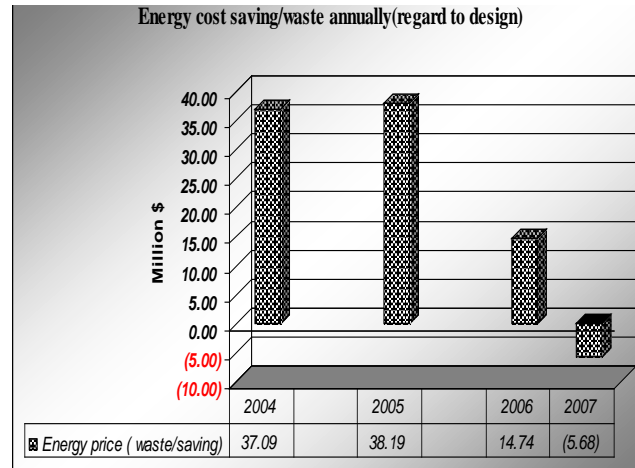


Figure 5: Energy cost saving / waste annually

Auditing

The audit process is not down systematically. Also the audit process is non financial and external focus. External audit determines conformance to standard (ISO 9001) not to the organization's operating procedures and all of its process indexes. The external audit didn't provide relevant feedbacks about process effectiveness. Also the audit report has been delivered when the audit process is complete and the auditor not involved in process of corrective or preventive action definition. The auditor in many cases is not familiar with the process and only checks the conformity to the ISO standard.

Holistic view to quality management system (QMS)

Through research finding the weaknesses of QMS in this case study to be concluded:

- No continuous organization process improvement;
- Process definition reduced to the documentation of the existing state.
- Processes maintenance take in the practice through the system of correction and less prevention measures
- Insufficient training about problem solving methods
- No MIS (management information system) exist in the company and information process to be done base on traditional way due to insufficient awareness about information resource process management.
- Management relies on empirical experiences and traditional management of organization.
- Low level of resource management

Conclusion

The ISO9001 standard set the minimum requirements for standardization of process in an organization. The preparation of quality management system has positive effect in Standardization and controlling of organization documents. The others benefit are decreasing in products nonconformity, energy/utility consumption reduction and products waste reduction. Only the production rate decreased annually. Analyzing this problem indicate that the company process performance measure indexes not well defined. For instance in maintenance, logistics, operation and inspection there are no real performance indexes exist. Also the audit process is external. This means that the audit process only check the conformance with the ISO 9001 not performance and effectiveness of business

processes. Also after ISO certification the managers tend to traditional practice. No change in culture (behavior /attitude) so Managers do business in 'fire-fighting' manner rather than using continuous improvement cycle (PDCA) and engaging their personnel in preventive actions. Organization structure is hierarchical and empowerment of personnel neglected by top managers. Through this study it's recommended as prerequisite to develop quality culture in organization. Leadership, management commitment/involvement and human resource development together are most important in terms of quality performance that should focus on them. For any company aim to performance, focus and efforts need to extend well beyond the requirements of ISO 9001 and include other quality management techniques and tools such as five S and Six Sigma. For any organizational change to be successful, it's necessary that fully realize the need for the change. They must be well aware of the strengths, weaknesses and limitations of their current state, as well as the potential and the characteristics of their desired future state.

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