

**ANY EFFECTS OF QUALITY MANAGEMENT SYSTEM  
(ISO9001:2008) ON PRODUCTIVITY OF GENERATION  
AND TRANSMISSION COMPANIES OPERATING IN  
SOUTH EAST KHUZESTAN WATER**

**Payvand Papan**

**Abstract:**

The real goal of this research is to find any effects of quality management system(ISO 9001:2008) on productivity of **Generation and transmission companies operating in South East Khuzestan Water**. Statistical population of this research includes all personnel of this company at various departments who are really effective on quality. About 127 persons were selected as the research sample in compliance with Morgan table. Explanatory and measuring type method was used in this research. Data collection tool was a questionnaire made by the researcher for considering evaluation criteria as some of productivity items as the content and major format of questions. "SPSS" software was used in this research for further analysis of explanatory statistics (Abundance percentage, Average, ...) and conceptual statistics (Variance analysis and *t* test).

**Key words:** Quality management, ISO9001:2008, Quality guarantee, Customer- based process, Productivity

**Introduction:**

According to the civilization history, it is obvious that various periods are appeared based upon various factors which are also based upon non-changeable principle of “Permanent changes”. Therefore due to any relation among these factors, there are new conditions for lack of start of a modern period. Through evaluation of natural history, it is obvious that better selection was the base of natural periods and handled the case up to next period (1). “Quality” is the major principle according which we have development of civilization history. Quality has a great history and speaking about quality is not new and strange. New discussions belong to required tools for applying of quality and quality management policies. Therefore we may defeat any changes resulted from technology, economy and social forces. Quality problems at various countries made most of companies and industries to apply quality management attitudes.(2,3) Quality management is one of the most important issues in management of operations (4). Today only those companies are successful in competitive market which may overcome world competitors and make more progresses. (5). Quality is not just a policy of managers for maintenance of competitive position at international scene but a great principle for survival and remain. Most of companies and organizations intend to establish quality management in order to find more competitive priority (6), better business process (7), betterment of their products and services (8), betterment of effects (9) and productivity (10). This is because any establishment of quality management is one of the real successful ways for producing companies and servicing institutes (11,12). Any establishment of quality management could change the structure of companies and institutes and enables them to increase their productivity and also their competition power (13).

**Description:**

Today one of the most important issues of the state is to establish quality management system based upon world standards. But like other managerial sciences fields, such a concept has been applied from West. They have experienced all managerial changes in a gradual complementary process and now they have started quality paradigm. Then they will pay simultaneous attention to all aspects with their own experiences (14). Therefore if the organizations are applying these systems they have no chance only to make some changes not on their nature but in their different

parts and necessities. From among various quality control systems in country we have ISO9000 quality assurance system with highest rate of attention. In this paper, the researcher intends to find an answer for major question of this research which is finding any effects of ISO9000 quality guarantee system on productivity. After preliminary interview with various specialists of the organization, **Generation and transmission companies operating in South East Khuzestan Water**, it was concluded that even with high costs of implementation of educational courses for more knowledge of personnel with its necessities and also various problems like increasing of bureaucracy and long-term processes as well, of course all specialists are satisfied of this system and find their functions as much better as possible.

## 1-Research history

### 1-1-Concepts of quality management

Perhaps quality management is one of the most common trading terms used for most efforts in the way of promotion and betterment of quality within recent years (15). Quality management is betterment in traditional methods for work performance, trade and a technique for survival of current competitive world (16). From inter-organizational problems, those organizations which may apply different factors of quality management are focusing on work group and better management methods than control.

Quality development in the mentioned organizations is a part of work management process. In addition any made decisions are based upon this attitude that whether it may cause quality betterment? Not based upon any attitudes for little costs (16). Customer is the focus of all persons in an organization and all organization are intending to find and meet the necessities of customer, supervision control and developing activities (16).

### 1-2-Quality management definitions

There are various definitions from beginning of quality management process as follows:

**Juran & Goodfery** (17): It means meeting all customers' needs and removing any shortages and repetition of jobs.

**Kanji (18):** Kanji named quality management as the second industrial revolution.

**Fline et al. (19):** It is an integrated process for finding and maintenance of output with quality focusing on continuous

Anderson et al. (20): It is an integrated process for more quality at organization, operational leading, domestic/foreign cooperation, management of effective process, designing of product, learning, more attention to customer, personnel satisfaction and continuous betterment

### **1-3-Fundamental & effective factors on quality**

Generally there are various factors effective on products quality. Quality of products and services are directly under the effects of nine major factors named as **9M** as follows (21):

- 1- Market
- 2- Money
- 3- Management
- 4- Men
- 5- Motivation
- 6- Materials
- 7- Machines& Mechanization
- 8- Modern Information Methods
- 9- Product Requirements Mounting

### **1-4-Previous studies about any benefits out of establishment of quality management**

Quality management is a managerial wave (22) for more customer satisfaction through continuous betterment and group working (23). Therefore there are lots of studies about establishment and applying of quality management focusing on the goals and results. Rid et al. (24) explained that quality management will create more competitive priorities for companies. Today most companies are establishing quality management for creation more competitive priorities (25). Choong (26) stated that any establishment of quality management may cause

more competitive and resistance of companies along with a fundamental process in companies for focusing on process betterment. Most of studies about quality management stat that quality management could make better products/services, reduce the costs, more satisfaction of customers, more motivation of personnel and increasing the quality (27).

Chin et al. (27) explained that successful applying of quality management and capital return rate may cause an increase n market share. In a research about 235 companies, Radovilski et al. (28) stated that any applying of quality management will increase the profit, market share and productivity accordingly and also a reduction in costs and damages. Huang & Lin (29) stated that quality management may cause an increase in selling of quality products/services and more credit and fame of company.

## **2-Productivity**

### **2-1-The history and changes of productivity concept**

Productivity is not a new and unknown concept. Really it has an ancient history like the age of human beings on this land. But making any regular scientific and statistical researches about productivity is new and recent. Karl Max presented the theory of work force value and Adam Smith, as an analyzer of any relations between work and work division are considered as any persons who had great roles in finding the best meaning for productivity (30).

Others introduced productivity as a culture. It means a culture that may teach human being how to select a way for finding more profits. Some others consider it as an ideology. But in spite of all mentioned attitudes about productivity, all people believe that human being is the real cause of productivity not machines and tools.

### **2-2-Definitions of productivity**

Followings are important definitions for productivity (32):

**Liter:** (Production power)

**Early:** (Any relationship between output and tools for production of considered output)

**European Economic Cooperation Organization:** (output ratio) (Production rate or output) one of production factors.

**Davis:** Any changes in products out of applied resources

**Fabricant:** Any rate between output and imported resources

**Siegel:** A collection of output rates to input

**International Work Organization:** Productivity means any relation between output of a production system and applied inputs (like land, capital, work force) for producing of output

### 2-3-Different types of productivity:

#### 2-3-1-Profitability as a part of production factors and single factor of productivity

Productivity of general factors, General productivity, Systematic levels of productivity

It is possible to explain various levels of productivity in a systematic hierarchy form in a way that a level is a part of upper level.

#### A) *Minor group:*

- 1- Person's level
- 2- Group level
- 3- Product/service level
- 4- Unit level or process
- 5- Agency level

#### B) *Average group:*

Industry level

#### C) *National Major group:*

- 1-State's Economic Sectors
- 2-Natinoal level (33)

#### D) *Work Major group:*

Aerial level, International level. (34)



**2-6- (7C) for development of productivity culture & quality of a company:**

- Confidence & Trust
- Cooperation & Commitment
- Communications
- Coherence
- Continuity
- Creativity
- Continuous Training

The above-mentioned items, “7C”, could be considered as the major criteria of evaluation of productivity processes and company’s quality or development guidance of new forms of productivity and quality as well (35).

**2-7-Effective variants on productivity:**

Power, Job recognition, Organizational support, Motivation or interest, Feedback, Credit, Environmental compatibility

**2-8-Effective Internal/External factors on organizational productivity**

**2-8-1-External factors:** Governmental attitudes, National Strategy of productivity & development, National programming, Financial policies, Banking, National programming for work force, Maintenance of environment, Scientific Information System, Communications system, Benefiting from natural resources, Land-use planning.

**2-8-2-Internal factors:**

**2-8-2-1-Technical – Financial sub-system:** Technology, Utilization system, Repair & maintenance, Modification & compatibility, Researches, Materials & Energy, Final evaluation of product

**2-8-2-2-Social-Humanistic sub-system:** Organizational structure, Major scopes of the organization, Strategic assignments, Betterment of systems & methods, Betterment of Human Resources system, Betterment of Managerial & Supervising systems

## 2-9- A relationship between ISO9000 (Quality management) with Productivity

Integrated quality management is like a 3-legs chair. The mentioned 3 legs are as follows:

Quality/ Integrated & Innovative productivity/ Technology

All above-mentioned factors have an equal size and distance from each other. (44)

## 3-Goal

This paper intends to specify any effects of establishment ISO9001:2008 quality management system on productivity of **Generation and transmission companies operating in South East Khuzestan Water.**

### 3-1-Major question:

Whether establishment of ISO9001:2008 quality assurance system has caused any increase in productivity of **Generation and transmission companies operating in South East Khuzestan Water.?**

### 3-2-Indirect questions

There is a significant relation between establishment of ISO9000 quality assurance system and organizational activities. There is a significant relation between establishment of ISO9000 quality assurance and more clear responsibilities of personnel. There is a significant relation between useful span of equipment and organizational constructions. There is a significant relation between establishment of ISO9000 quality assurance and more effective utilization of human resources of the organization. There is a significant relation between establishment of ISO9000 quality assurance and quality of organizational activities.

## 4-Methodology

This research is explanatory or measuring type. Data collection tool was a questionnaire through which all required information was selected out of statistical population including the personnel of **Generation and transmission companies operating in South East Khuzestan Water.** They were really effective on quality. Due to little number of specialists, total 127 persons were



selected as well. Then sampling method was applied among personnel by the use of simple random sampling and lottery form among members of all groups. There was a questionnaire based upon evaluation criteria as the major parameters of productivity as the major content of questionnaire questions. All 127 persons received the mentioned questionnaires. There were 26 questions about evaluation criteria and any relation between written theories as well. Chronbach alpha was used for determining reliability of questionnaire equal to 0.96. Likert range was used for answering to major questions of a 26-question of questionnaire. There was a range of answers from very little up to very high.

Tables 1 & 2 are different samples of this research:

Table 4-1: Frequency distribution of academic level of respondents

No.	Academic level of respondents	Abundance	Percentage
1	High School Diploma	29	22.8
2	Associate Degree	40	31.5
3	Bachelor of Science	51	40.2
4	Master of Science	7	5.5
Total		127	100

About %40 of respondent had high school diploma, %31.5 had associate degree and %4.7 had Master of Science degree.

Table 4-2: Frequency distribution of organization level of respondents

No.	Organizational unit of respondents	Abundance	Percentage
1	Non-technical employees	26	20.5
2	Technical employees	41	32.3
3	Non-technical specialists	29	22.8
4	Technical specialists	31	24.4
Total		127	100

Great number of personnel belongs to technical employees, then technical/non-technical specialists and the least rate belong to non-technical persons.

**5-Data analysis**

Upon providing a statistical definition of data, here the relevant data of all theories are combined and evaluated by the use of “Statistical theory tests” for correctness or incorrectness purposes.

**5-1-Evaluation of theories**

**5-1-1-First theory**

H<sub>0</sub>: There is a significant relation between establishment of ISO9000 quality assurance system and organizational activities.  $H_0=P=0$

H<sub>1</sub>: There is not a significant relation between establishment of ISO9000 quality assurance system and organizational activities.  $H_1=P\neq 0$

Table 5-1: Statistics of first theory

Statistical index	Number of samples	Average	Violation criterion	t qty	Freedom rate	Sig
Better control of organizational activities	127	3.7583	0.5205	9.22	126	0
Average situation		3	0			

**5-1-2-Second theory**

H<sub>0</sub>: There is a significant relation between establishment of ISO9000 quality assurance system and more clear responsibilities of personnel.  $H_0=P=0$

H<sub>1</sub>: There is not a significant relation between establishment of ISO9000 quality assurance system and more clear responsibilities of personnel.  $H_1=P\neq 0$

Table 5-2: Statistics of Second theory

Statistical index	Number of samples	Average	Violation criterion	t qty	Freedom rate	Sig
Variants						
Clear responsibilities of personnel	127	3.73	0.6136	7.524	126	0
Average situation		3	0			

**5-1-3-Third theory**

H<sub>0</sub>: There is a significant relation between establishment of ISO9000 quality assurance system and useful span of equipment & organizational constructions.

$H_0=P=0$

H<sub>1</sub>: There is not a significant relation between establishment of ISO9000 quality assurance system and useful span of equipment & organizational constructions.

$H_1=P \neq 0$

Now it is the time for calculation of statistic parts:

Table 5-3: Statistics of third theory

Statistical index	Number of samples	Average	Violation criterion	t qty	Freedom rate	Sig
Variants						
Useful lifespan of equipment & constructions	127	3.99	0.4024	15.559	126	0
Average situation		3	0			

**5-1-4-Fourth theory**

H<sub>0</sub>: There is a significant relation between establishment of ISO9000 quality assurance system and more effective utilization of human resources of the organization. H<sub>0</sub>=P=0

H<sub>1</sub>: There is not a significant relation between establishment of ISO9000 quality assurance system and more effective utilization of human resources of the organization. H<sub>1</sub>=P≠0

Now it is the time for calculation of statistic parts:

Table 5-4: Statistics of Fourth theory

Statistical index	Number of samples	Average	Violation criterion	t qty	Freedom rate	Sig
Variants						
More effective utilization of human resources	127	3.2438	0.7327	2.104	126	0.042
Average situation		3	0			

**5-1-5-Ffith theory**

H<sub>0</sub>: There is a significant relation between establishment of ISO9000 quality assurance system and quality of organizational activities. H<sub>0</sub>=P=0

H<sub>1</sub>: There is not a significant relation between establishment of ISO9000 quality assurance system and quality of organizational activities. H<sub>1</sub>=P≠0

Now it is the time for calculation of statistic parts:

Table 5-5: Statistics of fifth theory test

Statistical index	Number of samples	Average	Violation criterion	t qty	Freedom rate	Sig
Variants						

Better quality of organizational activities	127	3.8792	0.6155	9.033	126	0
Average situation		2	0			

As it is obvious in tables 1-5 to 5-5, since sig amount is lower than significant level of  $\alpha=0.05$  and also the obtained t amount has a great distance from mentioned t in table equal to 1.653, therefore  $H_0$  is rejected. Then theory  $H_1$  is approved at assurance level of %95 based upon any signification relation between ISO 9001:2008 quality assurance system and company's activities, better control of company's activities, more clear responsibilities, increasing of life span of equipment and constructions and more effective utilization from human resources. Regarding all tables 1-5 to 5-5, it is obvious that all variants have an average grade more than average rate. Generally all theories are confirmed. Therefore with a confidence of %95 it is possible to claim that due to have special control criteria, any establishment of ISO9001:2008 may cause better control of organizational activities, control criteria, more clear responsibilities of personnel and increasing of useful lifespan of equipment and constructions due to presenting of exact methods and standards and more effective productivity of human resources and submission of exact and suitable standards for higher quality of organizational activities.

### 6-Conclusion & proposals

According to the results of 5-folded theories, it is obvious that all mentioned theories were applicable for proving important ideals including establishment of ISO9001:2008 quality assurance system. General results of this theory show the effectiveness of any establishment of this system on better productivity. It means that any effects of ISO9001:2008 quality assurance system on betterment of organizational activities, more clear responsibilities of personnel, increasing useful lifespan of equipment, betterment of the quality of organizational activities may cause more productivity of company.

Furthermore since the present research has been applied in Iranian Water Industries for the first time and also regarding the important role of quality management system in increasing of productivity it is proposed to all other companies especially Generation and transmission companies operating in water factories in all its forms including reducing of costs, reducing of

repetition of works, increasing of customer satisfaction and personnel motivation and applying quality management system as well.

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