

THE QUALITY ASSURANCE SYSTEM:
THE BAHRAIN NATIONAL GAS COMPANY- CASE STUDY.

BY
AHMED KHALIFA AL-KHALIFA
UNIVERSITY OF GLAMORGAN
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I declare that this dissertation is a result of my sole independent investigation and that all sources are duly acknowledged in the references.

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Abstract

This empirical study is an attempt to assess the implementation of the Quality Assurance System in the Bahrain National Gas Company (Banagas) and also to evaluate the cultural requirements that are needed for implementing the Quality Assurance System in the company.

Data was collected through administering a structured questionnaire to 70 employees at different organisational levels.

The Internationalisation of the ISO 9000 and its world wide spread made companies all over the world heighten their interest in these standards. These interests are also market driven through increased global competition or customer expressed demands or requirements. For the Arabian Gulf companies it is most significant to be able to compete in global markets catching the Quality Train.

The study also presents detailed literature on the ISO 9000 standards and the Total Quality Management. The empirical findings and conclusions are discussed and presented.

The main conclusion is that the implemented Quality Assurance System has been initiated with full support from the Top management and employee involvement at every step taken to achieve ISO 9000 registration with the British Standard Institute. In order for the Bahrain National Gas Company to ensure the widening of its Quality scope into Total Quality Management, it is necessary for the company to address its cultural issues by training, recognising and rewarding staff, and by implementing a continuous improvement programme.

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Chapter One

INTRODUCTION

The purpose of this study is to gain an insight into the practice of ISO 9000 certification as a base for the Quality Assurance System in the Bahrain National Gas Company, (Banagas).

The study is also aimed at assessing the implementation of the Quality Assurance System which was in force since November 1994. Emphasis was also placed on evaluating the cultural requirements that are needed for implementing the Quality Assurance System in the company.

The changing pattern of the world markets induced by the change in customer behaviour and the fierce local competition has forced companies to change their strategies. More than two decades ago, technological innovations yielded years of competitive advantage to companies but now they provide only a few months' head start before they become common practice. The fierce local competition and the lowering of trade barriers in the world market have encouraged many companies to enter other international markets in an effort to increase profitability.

Nowadays customers world wide would no longer accept inferior goods and services. In order to compete effectively in today's global environment, business must produce quality goods and services at competitive prices, and they must continuously improve their products and services to have any hope of long-term success. The realisation of this importance by the companies has sparked the "spreading fire" of the Quality movement which is spreading. In the 1980's this was assisted by Internationalisation of the Quality standard BS 5750 into its current form ISO

9000, and the major success of Tom Peter's "In Search of Excellence" which took the world by storm.

In the Arabian Gulf region the Quality movement has been sparked in medium-to-large companies. The majority of the companies that received the Quality standard certification are the ones that rely mainly on international companies (e.g. Oil & Gas industries, Aluminium mills etc.). Sensing the need for competing in the global market they are complying with the increase in the higher Quality of products or services required by the customers.

The first Bahrain company to be certified for the ISO 9000 services of Quality Assurance standards is Comsip AL A'Ali which was certified in April 1993. This shows that the Quality movement in the region is relatively young. This study is limited to the time from the certification of Banagas till the date of this study which represents 2 years. This reflects mainly the cultural aspects of the Quality standard while the majority of the academics suggest that cultural issues require a long time to change (5-7 yrs).

This study is based on a designed questionnaire addressed to 70 employees (at different levels) out of a total work force of 340. Semi-structured interviews were conducted with some from the management and some from the employees to gain further supportive information and to clarify certain specific aspects related to the study.

The findings and conclusions that can be drawn from this study are set out in chapters five and six. The main questionnaire is shown in Appendix 1.

The significance of this study lies in attempting to provide a base for further research in implementing the Quality Assurance System and also to assist the company

management in formulating a broad based Quality strategy for future competition and customer satisfaction.

Organisation of the Study.

The study is structured in six chapters as follows:

Chapter one briefs the scope, significance and limitation of the study in addition to showing the importance of ISO 9000 certification in the Gulf Region.

Chapter two reviews the most related literature on the subjects of Quality Assurance System and Total Quality Management.

Chapter three presents the story of the Bahrain National Gas Company for achieving the Quality Assurance System, the case of this study, reviewing the road taken by the company until ISO 9000 certification.

Chapter four focuses on the objectives and methodology discussing the data gathering methods and the research sample.

Chapter five presents the results and analysis of the survey.

The final chapter of the study represents the main conclusions drawn from the findings and recommendations.

Chapter Two

Literature Review

2.1 The Quality Concept

Quality is one of the most misunderstood issues in business today and yet it is central to the survival of even the largest organisation. There is only one key focal point for business in the world today : The Customer.

Only the business which focuses on the requirement of their customers will survive in future.

Quality is probably the best way of assuring customer loyalty, the best defence against foreign competition and the only way to secure continuous growth and profits under difficult market conditions.

2.1.1 What is Quality ?

The Oxford Concise dictionary defines the word Quality as:

“The degree of excellence”

“A general excellence”

“Distinctive attribute or faculty”.

The definition makes the word quality describe attributes such as beauty, goodness, expansiveness, freshness and luxury. This makes the quality concept appear to be a very difficult concept to understand and almost impossible to manage.

Before quality can be planned and managed it must be defined more precisely and meaningfully. For this case quality is defined by almost all academics & companies as conformance to customer requirements. This has been expressed in many ways by a number of authors:

1. “Fitness for purpose or use”- Juran

2. “The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs :- BS4778, 1987 (ISO 8402)
3. “Quality should be aimed at the needs of the customers, present and future”- Deming.
4. “Conformance to requirements”- Crosby.

Other Definitions of Quality are :-

- “The amount of unpriced attributes contained in each unit of the priced attribute”.
- “ The degree of excellence at an acceptable price, and the control of variability at an acceptable cost”.
- “That standard of Excellence which is mutually acceptable to the buyer and seller”.

Although the above definitions are quite diversified, they suffer from many deficiencies, as follows:

1. None of the above definitions recognise the multidimensional nature of quality.
Each has only a single focus.
2. They all consider only the product’s quality, neglecting the process by which the product is produced.
3. Relying on a single definition from above is misleading. Quality should be viewed from multiple perspectives.
4. High quality as defined by the producers, may not be so by consumer standards, perception and response. A customer-based definition of quality may well contradict producer- based definitions.
5. The definitions of quality mentioned earlier are very general and do not distinguish between the different quality aspects in different products. This is misleading.
Quality attributes in tangible products are different from services and even service

has unique characteristics, attributes, and different preference scales for its attributes.

6. Quality in itself is not different for different customers, but it is relative to the price charged to the consumer, and the cost incurred by the producer, Such variables should be accounted for in the definition of quality. Thus quality is a function of all these variables.
7. Most companies see quality as a goal but quality should be seen not only as a goal but as a means for goal achievement as well.

By focusing on the above mentioned definitions and their associated deficiencies, a more accurate definition of quality would be:

Quality is a customer's perception that his expectations have been exceeded.

This definition has several implications. In the first place, it says that quality is perceptual and personal. There will be a mixture of objective features and subjective elements, that influence customers' perceptions.

Customers create expectations. These expectations are usually somewhat above what they really need but below what they would like or want. Depending on what the customers believe to be available in the market they will locate their expectations. In the end it is the satisfaction of expectations regularly that leads to "Delighting the customer".

The analysis of the main elements of this definition can be stated as follows:

A. Perception.

Culture provides people, not only with a way to make sense of the world they live in, but also with a filter that blocks things, that seem irrelevant or contradictory. Culture also limits people's field of vision. Anything outside the cultural scope of vision may

not be perceived appropriately or may be blocked. Therefore, People will not create any expectation about it.

B. Expectations.

As customers, our expectations about a product are made up of several “elementary” expectations regarding some generic attributes of the product.

The first attribute is the first thing we (customers) take note of a product, that is its physical characteristics:- size, shape, colour etc. Then the product features are considered, its functional characteristics, the way it is supposed to perform. Finally the reliability of the product is considered.

In view of the misleading definitions of quality one approach involves a broader perspective of quality which classifies quality as having eight dimensions (Prof. David Garvin, 1984). These are listed and explained in Exhibit I. These dimensions provide management a frame work to better understand quality and thus guide the efforts and development of their quality systems to meet the needs, requirements, perceptions and expectations of their customers.

EXHIBIT I

DIMENSIONS OF QUALITY

CONFORMANCE TO SPECIFICATION	The degree to which the out put meets the standards of its operating characteristics.
PERFORMANCE	The grade of service or product. It is the operating characteristics of the good or service. When people are willing to pay more, it is often for better performance. Surveys reveal that performance is

the number one way that consumers think about quality.

3. **FEATURES** those characteristics that supplement the basic functioning of the output.
4. **RELIABILITY** The probability of a malfunction within a specified time period.
5. **DURABILITY** The extent of the life of the output. How tough is it and how long it lasts.
6. **SERVICEABILITY** Ease of providing a service or servicing goods.
7. **AESTHETICS** Beauty, elegance, and other features that appeals to the eye and other senses.
8. **PERCEIVED QUALITY** Impression of quality based on things other than here and now evidence, loyalty to brand, reputation etc.

Richard J. Schonberger in his book “Building a chain of customers” (1990) expanded Prof. Garvin’s eight dimensions to a list of twelve dimensions, Schonberger added to Garvin’s list Quick response, Quick-change expertise, Humanity and Value. He suggested that the extended 4 dimensions are basic and vital in their own right and not viewed as a variation of some of Garvin’s eight dimensions.

This wide approach of multiple dimensions provides a wide selection scope to companies that wish to differentiate their product or services in terms of quality.

This can be achieved by focusing on a number of the above mentioned dimensions.

However the company should select the dimensions carefully so that it will have value-added effect.

2.2 Quality Cost

Quality related costs are incurred by companies for ensuring that products & services meet with the customer requirements. These costs are incurred from a range of activities all of which impinge on the quality of the product or service, e.g. Sales & Marketing ; Design; R&D; Purchase & Supply & logistic; Production & planning; Manufacturing & Service.

In most companies the majority of quality related costs are costs of non conformance (CONC) with the requirements of the customers. The majority of companies are aware of the product related cost of Non-conformance (CONC) but tend to ignore the vast amount of money wasted in other areas; administration, costs associated with excessive debtor days or costs incurred when customer requirements haven't been fully determined.

2.2.1 Importance of Quality Costs

Quality costs are important for a number of reasons.

1. They are often large.
2. The size of the costs and where they occur are unknown for most businesses.
3. The great majority of costs are associated with failure and appraisal activities.

4. Savings in Quality costs would have a significant, positive impact on the bottom line results.
5. The large burden of failure and appraisal activities indicates that the businesses tolerate a large number of defects, which they then have to find and correct. The appraisal methods for detection miss a proportion of failure, so some non-conforming output will be received by the customer, resulting in dissatisfaction and disloyalty of the customer.

2.2.2 Why measure quality costs?

The quality costs are a true measure of the quality effort. A competitive product or service based on a balance between quality and cost factors is the principal goal of the company.

The analysis of cost of quality can be a very useful management tool in the assessment of the effectiveness of the management of quality. Therefore it can act as a driving force (motivator) for the management to manage quality better.

It enables the management to make more objective business decisions.

It can also be used to monitor performance, to identify products, processes and departments for investigation. Thus the company can set targets and measure the performance against the target.

By understanding and knowing the costs of quality the company can prepare better budgets and the sales force can make better quotations for the products or contracts.

2.2.3 Categories of Quality related Costs.

The cost of quality may be broken down into five categories.

1. ***Prevention costs***: are the costs for meeting the cost of non-conformance by investing in preventive activities such as training the people to do their jobs properly and organising the business so that work gets done efficiently and effectively.
2. ***Appraisal costs***: These are costs which are incurred by the company in the effort for minimising the number of faults which reach the customers. These are about measuring, quality control, monitoring of processes and testing of products as they are produced and shipped out.
3. ***Internal failure***: Costs resulting from failure to achieve conformance to requirements before it is shipped out (before it reaches the customer). It may involve not only waste, scrap or rework but also such elements as poor design, poor research and development, poor manufacturing engineering work etc.
4. ***External failure***: Costs resulting from failure or achieve conformance to requirements after the product or service reaches the customer. Companies tend to cost this in terms of warranty repairs, but there are a number of other costs associated with this, such as engineer's time and effort, extra sales effort to regain the confidence of the customer.
5. ***Lost opportunity costs***: This cost is when a company may lose potential business that they did not know existed. The cost of the lost opportunity is generally the highest of the cost of quality, though it can often be caused by trivial causes.

2.2.4 Breakdown of Costs of Quality

Prevention costs

1. Design procedures.

2. Training
3. Quality Planning
4. Quality assurance
5. Staff appraisal and surveys
6. Setting product or service specifications.
7. Market research, customer survey
8. Supplier improvement program

Appraisal costs

1. Quality Auditors
2. Supplier Rating (Vendor Audit)
3. Inspection of incoming material, processes and the final product
4. Calibration of maintenance of equipment used in all inspections
5. Checking appraisal returns
6. Inspection of plants

Internal failure costs

1. Scrap, waste, rework, rectification of faulty products
2. Management reports not provided on time
3. Failure analysis
4. Excess capacity
5. Poor forecasting resulting in excessive stocks
6. Recruitment of unsuccessful recruits
7. Staff turnover

8. Inadequate services
9. Warranty after repair
10. Employment disputes with the Unions

External failure costs

1. Product liability for design failure
2. Returned goods for design flaws
3. Orders lost because products were not launched on time
4. Bad-debts
5. Product does not meet market requirements
6. Poor customer relations, due to inadequate training of personnel
7. Warranty claims
8. Receiving, checking, repairing and / or replacement of returned product (due to failure)

Lost opportunity costs

1. Loss of goodwill
2. Loss of new customers due to the advice given by an unsatisfied customer

2.3 Quality Management System

The objective of Quality Management System (QMS) is to improve Quality by eliminating the causes of non-conformance in every activity throughout the Company.

2.3.1 The Benefits of a Certified QMS

An approved QMS provides assurance to customers that the company is committed to quality. It demonstrates that the company has implemented procedures which enable it to :

- identify the requirements of its customers
- ensure it is able to supply products & services in accordance with those requirements
- ensure delivered products conform to those requirements

Although the QMS only defines what must be controlled and not how the control is achieved, a company which understands why they are introducing a QMS can implement a flexible system according to their requirements and then through the system realise the benefits of an effective QMS.

A well planned and effective QMS will reap more benefits than the ones mentioned above. These are as follows :

1. Satisfied and loyal customers because the products and services are always produced according to their requirements.
2. Reduced operating costs as waste is eliminated and efficiency increased as a result of eliminating non-conformance.
3. Improved competitiveness and profitability as operating costs are reduced; and
4. Improved morale as employees develop greater understanding of the business, are able to work efficiently, and are involved in managing their working environment.

2.3.2 Types Of Quality Systems And Processes

Quality Systems can be categorised under the following headings:

Quality Control

Quality Assurance

Total Quality Management

Quality Control

QC is concerned with defect detection. The system uses inspection procedures and statistical quality control techniques to ensure that during designing, manufacturing and servicing both work and materials are within limits that will ensure product performance and reliability.

Inspection is a traditional approach to quality control. It concentrates on faulty work as an after-the-event process. Inspection departments are installed not only to check final products but also raw materials, tools piece parts and all manufacturing processes. Inspection is still used in one-off and jobbing factories. It has been replaced especially in large batch production & in mass-production and process industries.

Statistical Quality Control

Statistical quality control uses sampling techniques and mathematical analysis to ensure that during designing, manufacturing and servicing, work is carried out and material is used within the specified limit required to produce the desired standards of quality, performance and reliability.

An optimum level of control has to be established to strike a balance between the risk of losing sales because of poor quality and the expense of maintaining costly quality control procedures.

The limitation of Quality control is that it only detects the faults and does not provide for the prevention of faults. This means that it does not improve the quality of the product, it only maintains a certain quality of the product.

Quality Assurance

Quality Assurance emphasises defect prevention which focuses on defect detection through post-production inspection. It uses production and operations management methods and other procedures to ensure that quality is built into the system.

Quality Assurance makes use of statistical process control techniques where applicable but is based on the compliance to standards and procedures laid down by BS5750 (ISO 9000).

Statistical Process Control

The system detects and helps to eliminate non-random variations in the operation of the process. The SPC in contrast to statistical quality control addresses the causes of the problem by asking the question ‘what is going wrong with the process?’. The Statistical quality control in turn asks the question, ‘what is wrong with the part?’, rather than dealing with the causes of the problem.

2.4 The Evolution of ISO 9000

The life of the ISO 9000 began with Quality Control which is an element of Quality Management. Quality control emerged as a function in industry after World War II and the principles were codified by J.M Juran in his “Quality Control Hand Book” of 1951. The progress in this field has always been dominated by the military, starting with the inspection of armaments in World War I. The first quality systems standards were developed in the 1950s in the United States. The Military Specification MIL-Q-

9858 A “Quality Program Requirements” was the first quality system standard. Even though this standard did not include a requirement for internal quality auditing, it did cover much of what is found in ISO 9000 today.

The first appearance of a requirement for internal quality auditing appeared in MIL-Q-215 UG, “Product Quality Program Requirements for Fleet Ballistic Missile Weapon System Contractors”. These standards were followed by quality systems requirements for:

The National Aeronautic and Space Administration (NASA)- NPC 200-2 1961 and the Commercial Nuclear Industry- 1972-73.

BSI issued BS 5179 which was heavily based on the Defence Standards but was aimed at the non-military market.

Food and Drug Administration.

Medical Device GMP-1978

Pharmaceutical GMP- 1978

In 1976, The North Atlantic Treaty Organisation (NATO) modified MIL-Q9858A to create a series of NATO quality system standards known as AQAP-I, AQAP-2, AQAP-3.

In 1979, the British Standard Institute (BSI) modified the NATO AQAP standards to create a series of quality systems standards identified as BS 5750 Part I, Part II & Part III. By 1984 BSI had drafted a revision of its BS 5750 and in view of the

International interest in the subject encouraged the International Standard Organisation (ISO) to embark on International Standards for Quality systems. Over 26 countries were involved in its development. The standard broke the mould of military pedigree and set a new world standard for quality management. Recognising the value of quality systems standards, the International Organisation of Standardisation published the ISO 9000 series in 1987. The series included models ISO 9000- 9004.

Model ISO 9000 is of an advisory nature containing guidelines for the selection and use of quality Management and Quality Assurance Standards.

The model ISO 9001 defines a quality program for use when the customers demands the exhibition of ability for the design, production, completion and support of the product.

The model ISO 9002 defines a quality model for the production and completion of a product.

The model ISO 9003 defines a quality program for final inspection and testing.

The model ISO 9004 provides guidelines for the organisation of quality and detailed instruction for every company that is interested in the development and installation of a quality system. It also includes the definition of the extent to which each element of the quality system should be applied.

In Europe, CEN (the national standards organisations of 16 European Countries) also adopted ISO 9000 as the European standard EN 29000: 1987. Hence, in Britain, in

Europe and throughout the world, the standard for quality management is identical.

BS 5750, EN 29000, ANSI/ASQC OGO and ISO 9000 are all the same standard.

The standard has shown a major international triumph. Around the world, most countries accept this standard, sometimes giving it their own name. This means that companies in one country can order goods from a supplier in another country knowing that both companies are using parallel quality systems.

2.4.1 The World Wide Spread of ISO 9000

The European Community's adoption of the global application of conformity assessment procedures that incorporate the ISO 9000 standards was a reason that caused the ISO standard to gain rapid acceptance. Other countries were concerned about the development of a "Fortress Europe" and worried that the EC was utilising the ISO 9000 standards as a non-tariff trade barrier. To ensure their access to the European market, many countries adopted ISO 9000 series standards. Part of these countries have adopted ISO 9000 also because they realise that adoption of the standards makes sense for the countries' national and business needs.

In 1992 companies felt that the integration of the European market, which seemed so distant in 1991, was now upon them. Companies felt that if they did not act quickly they would be excluded from trading with the EC. This inturn started an ISO 9000 panic in the companies. Many companies convinced themselves that they must have a

registered quality system to compete effectively in both domestic and international markets.

2.4.2 The Advantages of ISO 9000

For the Employees

The implementation of the standard gives the staff a better understanding of their role and objectives by having a documented management system. Through the use of an efficient management system and because they know what is expected of them the stress level is reduced amongst the staff.

Morale is boosted and the staff develop a sense of pride through achieving the goals of registration and from customer satisfaction.

For the Customers

The customers have more confidence in the company's products / services as they get a known level of quality that is independently audited. The quality standard minimises their risk of getting a sub-standard product or service. The ISO 9000 provides the customers a means to manage the company, their supplier, better by specifying that they must have an ISO 9000 system. They can also assess the supplier's quality system, and thus check the company's ability to produce satisfactory goods and services.

For the Organisation

The organisation would benefit from the implementation of ISO 9000 standard in:-

- The product/ services will be of a more consistent quality with the production of fewer rejects.
- Cost saving through more efficient production.

- Provide an opportunity to improve the quality of raw materials by requiring the supplies to have a ISO 9000 system.
- Export marketing is easier because of the world wide recognition of ISO 9000 (BS 5750)
- Secure greater customer loyalty because of continuous satisfaction of their needs which gives them no cause to seek another supplier.
- Opportunity to use ISO 9000 as publicity to win more sales.

2.4.3 The Disadvantages of ISO 9000

The ISO 9000 standard is not a quick-fix formula. It takes between six months and two years to reach certification. During this period a lot of work/ effort is expected from the organisation and its staff. People will have to struggle to write procedures and to undergo training. This may cause some members of the staff to resent changes, some may leave and others may be obstructive. This inturn may slow the implementation process of the standard thus incurring additional cost to the cost of quality.

The standard often features large procedural manuals. Tom Peters wrote in *The Pursuit of Excellence* that there is a danger of companies increasing bureaucracy in an age where employee empowerment is encouraged. He feels that the companies should entrust the staff to do the work and not limit them by bureaucratic procedures.

ISO 9000 may also demand an increase in the number of quality staff. Therefore, there is a danger of having more manuals, more paper work, more meetings and more

measurements, while the real aspect of quality is over-looked. Combined with the excessive numbers of procedures it could turn the organisation into a more bureaucratic one.

In the rush to seek quality system registration, companies turn to ISO 9000 “experts” for advice and consultations on how to implement the system or how to seek registration. The demise of ISO 9000 is being brought about in part by the quality system Consultants and Registrars who advise their clients inadequately. Some of these ISO 9000 “experts” may not carry the practical experience. Some of these advisors have misled companies by telling them to “Just document what you do and do what you document and you will be registered”. They then tell their clients: “By going through this process, you will save money”. Unfortunately, for many companies this may not be true. For many companies, the process of registration is becoming very expensive and a non-value added exercise. The high cost incurred is a result of the cost of documentation, record keeping, registration and surveillance now being added to a system that is already costing more than it should. Organisations unfortunate enough to receive and accept inadequate advice will ultimately convince management that ISO 9000 was oversold and was a total waste. Although this is an extreme case, I believe it should be included to reveal both sides of the ISO 9000 certification.

2.4.4 ISO 9000 as foundation block for TQM

For companies to survive and prosper in the twenty-first century, they have to make significant changes to the organisations to develop a world-class quality.

Although that the ISO 9000 standard series provide an effective quality management system it still has deficiencies in that it does not establish the following :

- Measurement of quality improvement
- Participation of the work force
- Personal leadership of the top executives
- Making quality goals a normal part of the business plan
- Establish customer focused improvement goals
- An organisational structure that is focused to avoid delay and other factors which can render the company resistant to change.

These deficiencies are solved by a quality program that improves the effectiveness, flexibility and competitiveness of a business as a whole (Total Quality Management). Now-a-days a lot of companies are looking at TQM as being the road to success & competitiveness in the years to come.

The ISO 9000 series of standards is a useful key for the organisation wishing to adopt a total quality program. ISO 9000 has the advantage of being a completely contained subject of TQM and one that has a measurable achievement- certification of the quality system by an accredited Registrar.

One of the pre-requisites of ISO 9000 series registration is management responsibility and commitment to the quality improvement (clause 4.1)). Management commitment has to be based upon genuine management comprehension of the extent and nature of the process. Comprehension of the process means understanding what process is to be

followed, what the goals and objectives of the process are, and what it is exactly that management has to change. When implementing a continuous improvement TQM program, generating commitment and comprehension is made more difficult by the absence of any clear end point or clear goal.

ISO 9000 requires the same commitment and comprehension as TQM , but offers to the management the attraction of quality systems, registration at the end of the process. This clear goal can help focus the commitment, understanding, and efforts of the management. To be successful, management must understand that the purpose for applying the ISO 9000 quality management system approach to their company is:

- to clearly define responsibility, authority of the requirements of ISO 9000
- to study each aspect of the quality system so as to remove all non-value-added activities;
- to ensure that each elemental requirement is covered
- and, to create a continuous quality improvement process that sets the foundation for further TQM activities.

With the proper management understanding, ISO 9000 can be an effective means for a company to begin the process of change required to make the journey to world-class competition.

2.5 Total Quality Management

“Total Quality Management is a comprehensive approach to improving competitiveness, effectiveness and flexibility through planning, organising and

understanding each activity, and involving each individual at each level”- John Oakland (1995)

TQM is a philosophy that applies several techniques using employee involvement and participation, statistical process control, (SPC), group dynamics facilitation of team-building/team interaction, and management commitment and involvement. The payoff for TQM is the elimination of waste and continuous improvement. TQM also has the benefits of breaking down departmental special interests, replaced by optimising for the total organisation by sharing information, creating departmental integration, striving toward organisational unity, and concentrating on long term business.

TQM is an organisation wide program to enhance quality in the work place. At the heart of the approach is the concept that each process is the customer (customer-supplier chain). Each part of the organisation is then both a producer and consumer. Thus statements from different authors can be briefly summarised as under:

Total Quality Management	
<u>IS</u>	<u>IS NOT</u>
A cultural change	A quick fix
Responsibility of Top Management	Delegated to subordinates
A systematic way to improve products	A new program and services
A structural approach to identifying	“Fire Fighting” and solving problems
Long Term	Short Term
Practised by everyone	A specialist discipline

2.5.1 Why Quality culture is a TQM pre-requisite ?

Developing a supportive organisational culture is critical to the success of major quality improvement effort as stressed by quality gurus. J. M. Juran and W. Edwards Deming have stressed the importance of developing a quality culture for the success of a major quality culture for the success of a major quality improvement effort. TQM being an organisation- wide management philosophy which emphasises the need to meet customer requirements and to improve continuously to do things “right the first time.” Developing a quality culture becomes a pre-requisite for the successful implementation of Total Quality Management. (TQM).

Westbrook defined TQM as an interrelationship between the organisation’s culture, its relations with its customers (internal and external), the use of organisational teams and cross-functional teams; an emphasis on problem-solving using teams : recognition of the need for continuous improvement, the use of measurements to evaluate system and practices, and to indicate the effectiveness of improvement efforts. John S.

Oakland defines TQM as having “hard” and “soft” components.

The “soft” components being:

- customer-supplier relationship.
- culture
- communication
- commitment.

And, the “hard” components being:

- System
- Tools

- Teams

G. Wilson, R. Miller and T. Bendell in “Taguchi Methodology within Total Quality” make the difference between a company that applies Quality and another that applies Total Quality which has continuous improvements embedded in the organisation’s culture.

2.5.2 Developing a Total Quality Culture.

When asking the question on what Total Quality culture is, it is seen that gurus and academics have different priorities of the components of Total Quality Culture. A review of the most common points is shown in Table 1.

Table 1 : Comparing the Gurus (Common Points)

components	Deming	Juran	Crosby	Ishikawa	Taguchi	Feigenbaum
Awareness		✓	✓		✓	✓
Responsibility	✓	✓	✓		✓	
communication		✓	✓	✓	✓	
Recognition/ Reward System		✓	✓	✓	✓	✓
Recruitment/ Training	✓	✓	✓	✓	✓	✓
Team work			✓	✓	✓	
Quality Circles				✓	✓	✓

The outcome of D. Garvin's "Quality on the line" reveals that high Quality levels do not come by "cultural advantage and national traits" but by the systematic implementation of "sound management practices". In his article he concludes that the Quality programs take time to develop. He suggests that what is required from organisations is a "long-term commitment to the fundamentals, working to improve the performance, educating and training the work force, developing an accurate and responsive quality information system, setting target for quality improvement, and demonstrating interest and commitment at the very highest level of management."

Joseph Juran regarded "Unawareness" as an obstacle in the way of employee motivation. His suggestion to solve the "unawareness" problem is by "education to provide information on how one's work affects customers." On gaining commitment from strategies include.

Job design principles:

- individual responsibilities
- frequent use enhances content of work, emphasises whole task and combines doing & thinking.

Management organisation: structure, system and style.

- flat organisation structure with mutual influence system.
- Co-ordination and control based more on shared goals and values.

- emphasise on problem solving.

Compensation policies:

- Variable rewards to create equity and to reinforce group achievement.

Employment assurance:

- Assurance that participation will not result in loss of jobs.
- priority for training and retraining existing work force.

Employee voice policies:

- Employee participation encouraged on wide range of issues.
- Business data shared widely.

Chapter Three

Banagas Story - The Road to Certification

3.1 HISTORY

The Bahrain National Gas Company (BSC) (BANAGAS) is 75% owned by the Government of Bahrain, 12.5% by Caltex Bahrain and 12.5% by the Arab Petroleum Investment Corporation. The company was formed by an Amiri Decree in March 1979 with the primary objective of conserving energy resources by maximising utilisation of associated gas in the State of Bahrain by Processing Associated Gas into marketable products namely Propane, Butane and Naphtha. The plant facilities were officially inaugurated on 17th December 1979 and the first shipment of 5,000 tons of Butane was made on 4th March 1980. Since then consistently high levels of production have exceeded original forecasts enabling the company to repay the initial loan within 18 months of start-up and to subsequently make considerable annual contributions to the state revenue.

In 1988, a 74 US \$ million Expansion Project was launched to upgrade the plant processing capacity from 170 MMSCFD (Million Standard Cubic Feet per Day) to 280 MMSCFD. The project which was implemented by the Government of Bahrain as a sole venture involved construction of two additional compressor stations, a new processing train at the central gas plant and Storage facilities at Sitra. The new facilities came on stream in 1990.

3.2 The Road to Quality Assurance

Over the past 15 years of operations, Banagas has adopted a Quality control system to ensure that the products meet customer requirements. To ensure that, Quality Control is maintained and improved; development of this system has been an ongoing process.

In 1992 the company had an idea of introducing an internationally recognised Quality Assurance System into the company's operations. The ground work and the preparation of manuals and procedures covering most of the company's activities started in 1992.

In the second half of 1993 the company launched a programme to enhance its quality control system in order to meet the requirements of the international standard ISO 9002. The programme included an awareness campaign to ensure the commitment of every employee to the Quality Assurance System. The programme also involved modifying some of the existing procedures, writing new ones and conducting internal audit to ensure that quality standard requirements are met.(See Appendix 2)

In July 1994 the Banagas Quality Assurance System was pre-assessed by the British standard Institute and the outcome was indicative that the company would be able to receive the internationally recognised ISO 9002 certification and become a Registered Firm when the Assessment is carried out. The 20th of November 1994 was scheduled as the date for the Assessment of the company's QAS. Two BSI-QA Assessors visited the areas included in the QAS scope for certification. The assessment of the company's QAS was successful and the company received the ISO 9002 certificate from the British Standards Institute in December 1994.

Following the certification of ISO 9002 Banagas extended its scope of the Quality Assurance system. The scope involved the writing and implementing procedure for activities which were not included in the scope of the certification to cover areas such

as Inspection, FSS (Fire, Safety and Security), Construction, Mechanical and Electrical maintenance. The scope also included bringing the Administration and Finance Departments into the Quality Assurance System.

3.3 Banagas and the ISO 9002

The mission of the Bahrain National Gas Company B.S.C. is to be one of the most efficient and effective companies in Bahrain. It is committed to **“always satisfy its customers requirements by providing them with quality products that consistently conform to or exceed the requirements of agreed standards and specifications”**. (See Appendix 3 - Quality Policy)

The quality policy also includes a dedication towards the process of continual quality improvement throughout the company.

3.3.1 Management Responsibilities

The General Manager is responsible to the Board of Directors for the company's activities and implementation of the QAS. He delegates the responsibility of Divisional Activities to the General Manager - production, administration and finance. He also delegates the responsibility for implementation, monitoring and co-ordination of the implementation monitoring and co-ordination of the QAS activities to the Quality Co-ordinator.

In turn the Divisional General Managers are responsible for the execution of duties of employees within their area of activities. The divisional General Managers also

delegate responsibility for departmental activities to their Department Managers such as operations, engineering and technical services, maintenance, administration, materials, finance and management services.

The Quality Manual also details the responsibility of the Quality Co-ordinator.

3.3.2 Management Review

The system that is established in accordance with the Quality Manual is reviewed at least every 6 months by the Management Review committee to ensure the continued effectiveness of the Quality Assurance System.

The Management Review Committee consists of:

- General manager
- Divisional managers
- Departmental managers (if deemed necessary)
- Quality co-ordinator

It is the Quality co-ordinator's responsibility to prepare a quarterly report to allow the committee to assess the Quality system's effectiveness.

The report includes:

- Internal audit reports.
- Independent audit report.
- Customer complaints.

- Non-conformity reports.
- Corrective and preventive actions.

3.3.3 Internal Quality Audits

Overall effectiveness of the Quality System were monitored through assessing the results of internal quality audits. Audits were scheduled, documented and timely corrective action was taken on any deficiencies that were identified. Banagas had 156 Internal Audits up to the initial assessment in November 1994. In addition the company was visited by external auditors from the British Standard Institute. The pre-assessment was carried out in July 1994 followed by the Initial Assessment by external Auditors in November 1994. Subsequent to the initial assessment the company has gone through three continuing assessment at six monthly intervals. The last Assessment by external Auditors was in July 1996.

3.3.4 Training

This covers induction, off the job training (both internally and externally) and on the job training with records being maintained of all training completed.

In-house awareness presentations

Banagas ran an awareness program over a period of three months on a regular basis. All company employees attended a 2 hour presentation on the objectives and benefits of ISO 9000, followed by a question and answer session. This was incorporated to kick-start the training programs. It was essential for the employees to understand the benefits of the change that was happening in the company.

Group discussions were also held, chaired by the General Manager, on the topic of the benefits of the Quality Assurance System and on the extension of the scope of registration and general QA issues.

A Quality competition was held monthly as a part of the awareness programme.

Figures 1 and 2 show the numbers of entries and the percentage of correct answers respectively. (See Appendix 4 - Quality competition data)

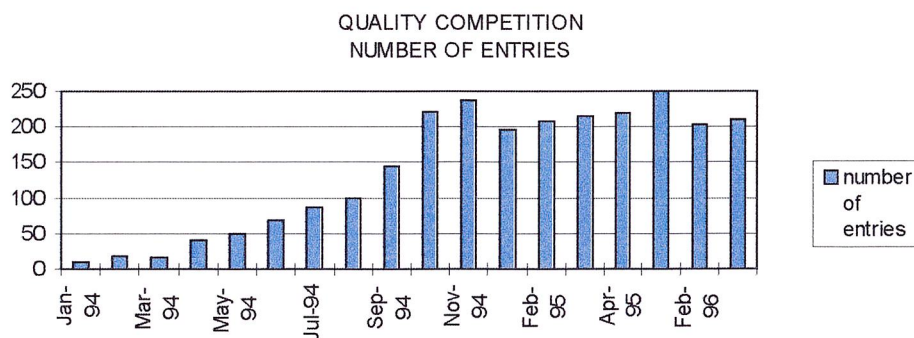


Figure 1

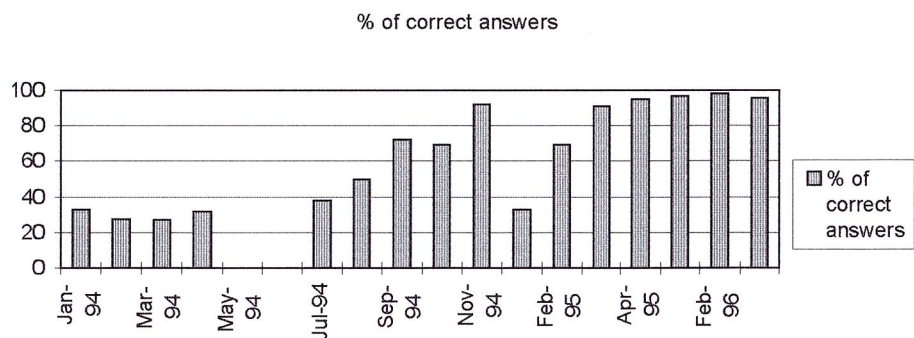


Figure 2

From the above figures, it is observed that as time went by the number of entries and the number of correct answers increased.

Overseas Quality Assurance Courses

Senior personnel attended quality related courses in order to be fully aware of the requirements of the QAS and to be able to take leading roles in the implementation of the quality assurance system.

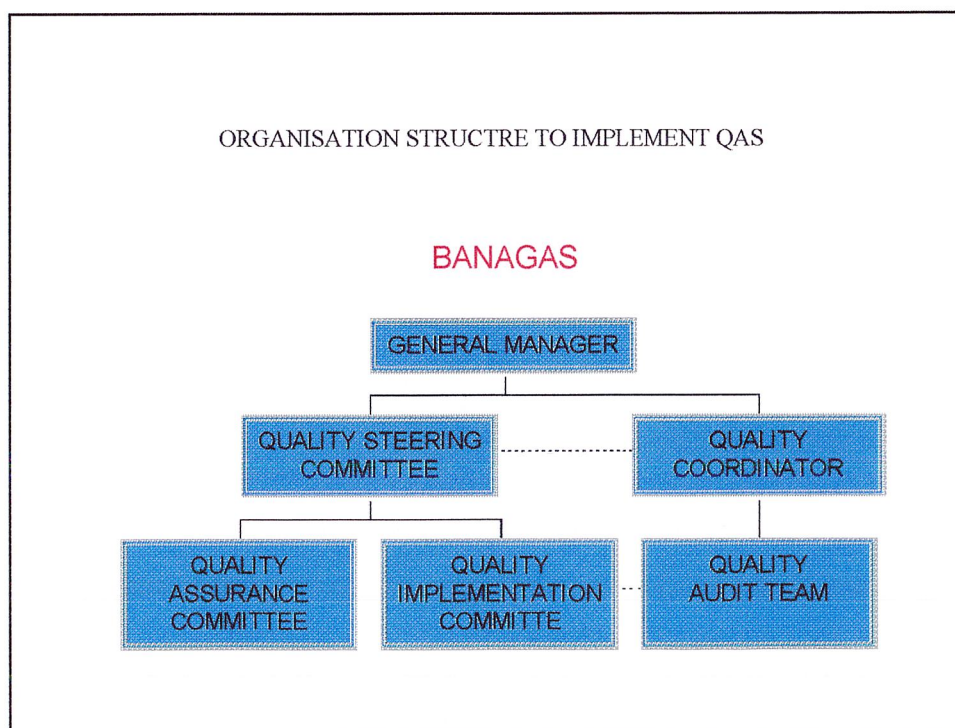
Internal Auditing Training Courses

A number of senior employees took part in an intensive 2 day training course on the Internal Auditing of Quality Systems. The management also attended a 1 day workshop on the objectives and planning of Internal Audits. The courses also included a week long Lead Auditor course conducted by BSI which was attended by a number of employees that were actively involved in the Internal Auditing . In November 1993 an initial training course for Internal Quality Audits was conducted with 14 of 27 attendants selected as Internal Auditors. As of date the company has 15 Internal Auditors and 4 Lead Auditors that are certified by BSI.

Seminars

The company has a policy of being represented by management or employees in seminars that are held in the local (gulf) area. This gives them the opportunity of meeting a number of renowned experts in the field.

3.3.5 The Organisation Structure to Implement the Quality Assurance System



The **QUALITY STEERING COMMITTEE** consisting of the General Manager, General Manager - Administration & Finance and Department Managers initially defines and plans the Quality Assurance System. It formally reviews the effectiveness of the Quality Assurance System including the results of audits, corrective and preventive action taken and customer concerns.

The council was set to meet at least monthly to provide and/or review strategy direction, establish plans for QAS on each site; review implementation progress, and improvement.

The **QUALITY CO-ORDINATOR** attends the Quality Steering Committee meetings and co-ordinates the activities of the Implementation and Awareness Committees and that of the Quality Audit Team.

The **QUALITY ASSURANCE IMPLEMENTATION COMMITTEE** consisting of selected Managers and Departmental Quality Representatives is to define and implement their respective department's quality related operating and work procedures and activities.

The **QUALITY AUDIT TEAM**, selected from all departments within the Company, are to carry out a programme of internal quality audit of the Quality Assurance System.

The **QUALITY AWARENESS COMMITTEE** responsibility is ensure that all employees are aware of the Company's Quality Policy, the implementation of the Quality Assurance System and its implications.

3.4 Cultural change in the company

A quality culture requires a genuine commitment on the part of the organisation in general. It must be recognised that introducing a quality programme is not only another project that ends with registration, but that there is a measurable payoff. It is important that all parties within the organisation become involved and accept it if it is to be successfully implemented. Steps must be taken to ensure that it prevails between top and middle management, between managers and supervisors and between supervisors and their subordinates. This will ensure the quality message getting across. The quality cultural change is one of the important issues that needs to be part of the organisation's culture itself. It requires continuous management leadership and support and it needs to be top-down to obtain the culture that is desired by management.

(A) Ownership at Top Level

For the QAS to bring efficiency and effectiveness it must be applied throughout the company. It begins at the top with G.M, senior directors and managers who must believe in the QAS. In the case of Banagas there was commitment at the very top of the organisation who recognised the need to update the company's Quality Control System to an internationally recognised QAS (ISO9000). The middle management got on the QAS band-wagon as serious talks proceeded on the viability and costs of the system. The talks were accompanied with management education on the QAS through seminars and short intensive courses.

In October 10th 1993, in the 55th meeting of the Board of Directors, the company adopted a resolution defining the Company Quality Policy, which endorsed the objectives and strategy of the quality initiative.

(B) Ownership by Employees

Organisation

Organisation structuring was considered necessary by the management for the continuity and survival of the quality system. This involved steps such as introducing a Quality Co-ordinator and Document Controller, positions which had never existed before. The formation of committees to execute and monitor the quality activities (see the Organisation Structure to Implement QAS).

Awareness

With the stage set for the introduction of the QAS programme an intensive publicity campaign was launched, starting with notice board posters carrying hints, slogans and definitions of quality. It also included :

- Publication and distribution of a QAS booklet which covered the definition of quality, the benefits sought by implementing the QAS, a quality Matrix indicating the relevance of each of the ISO clauses to departmental activities and the Company Quality policy.
- A Quality Bulletin was also published and distributed with the Company's Newsletter, Al-Shoala (the flame). Each issue of the Bulletin contained an interview with a member of the management which highlighted the particular relevance to his departmental activities or company wide interest.
- Initial briefing of the cross functional groups each of 20 employees, was carried out by the General Manager and the Quality Co-ordinator. This took the form of explaining the concepts of quality, the purpose of introducing the programme, the benefits sought and what is ISO 9000.

3.5 Work Environment Change

In order to improve the environment in which employees were to conduct their new tasks during the implementation of the quality programme the Company put emphasis on the human element and the well being of It's employees. This was demonstrated in a number of steps, stipulated by Banagas G.M. Mr. Ali Al-Ghindy :-

- Factors outside the work environment have a bearing on the employees' performance, so they were treated as human beings and not as numbers.
- Office space and furnishing were either renewed or improved. Even workshops and field work areas received adequate attention to the satisfaction of the workers. All these contributed to the raising of the morale of the employees
- Financial benefits were considered and, through the Joint Labour Committee, a number of reasonable requests were approved. Incentives to strive for goals and rewards were given.
- Training and development was provided in the area of quality to selected employees.
- Delegation of responsibility and empowerment was extensively used during the programme. This was to allow maximum participation, streamlined feedback and reinforced understanding of the effect of the supervisors' role model on their subordinates.
- Social and sports activities were increased.
- The selection and deployment of personnel within the quality task force was a form of recognition which created interaction within the groups as the members complimented one another and this eventually benefited the task execution.

- The creation of a competitive spirit between departments in fulfilling their tasks or in participation in quality competitions minimised deficiencies in departments' implementation and reduced the need for close supervision as the employees' knowledge and ability was increased.

Suggestion Scheme

Banagas implemented the suggestion scheme in 1986. The propose of the scheme was primarily to encourage employees to come up with new ideas for functional improvements. In the beginning the scheme was limited to suggestions related to personnel and plant safety, later it was expanded to include Productivity, Quality and Safety issues. Procedures were laid by Banagas for handling the suggestions.

The response from the employees was on an increase which showed their interest in improving their working conditions and safety. In 1994 the company received 59 suggestions, 112 in 1995 and 259 (for ten months) in 1996.

The increase of competition from the neighbouring countries requires Banagas to pursue the continuous improvement program. The move from Quality Control system to Quality Assurance System is a step towards the process of continual quality improvement. This ensures the company's ability to compete, not only with neighbouring gas companies but also globally, on providing quality products with consistency to their clients.

Chapter 4

Research Objectives and Methodology

4.1 Objectives

The literature review in chapter 2 on various issues has necessitated the formulation of the objectives of this study. The purpose was to **first** assess the implementation of the Quality Assurance System which is mainly based on ISO 9000 which has been undertaken by Bahrain National Gas company (Banagas). **Second**, to evaluate the cultural requirements that needed for implementing the Quality Assurance System in the company.

Based on the findings, recommendations will be proposed for the company management.

The concern of the study was with the implementation of the Quality standard (ISO 9000), the assessment of the cultural requirements of the implementation of the QAS and the company's future focus on Quality strategy. In effect the methodology is descriptive and comparative due to the nature of research questions.

4.2 The Questionnaire Design

A questionnaire was designed as a method of data collection to evaluate the Quality Assurance system practice and assess its implications and the future strategies.

Questions were tested and revised through 3 pilot interviews with 3 employees from different levels of the organisation who were not included in the final sample. The final format of the questionnaire totalled 5 pages (see Appendix 1) and consisted of 17 questions.

The questionnaire was structured into 2 main sections as follows:

1. Questions 8 to 19 related to the existing Quality Assurance System. The purpose of these questions was to assess the existing QAS practice in the company. The items included Management responsibilities, employee participation, Internal Quality Audit program, employee's understanding of the system and the company's responsiveness to deficiencies.
2. Questions 20 to 33 related to the cultural requirements of implementing the QAS, change and future improvements. Items such as communication, employee involvement, staff evaluation and reward, training and team work and Quality Circles.
3. Question 33 concerned the respondent's views concerning the QAS in Banagas.

4.3 Research Sample

The questionnaire was distributed among 90 of the employees in the company. The participants were Departmental Managers, Heads of sections, line managers and other employees.

4.4 Data Gathering and Survey of Appendices Received and Distributed.

The response rate of the questionnaire was about 77.77 %. The total received were seventy questionnaires out of ninety questionnaires distributed.

The main technique used in the study was questionnaire. The questions were made simple and interesting to the readers. Data were treated and analysed through SPSS package.

As part of the technique used, semi structured interviews were conducted with selected middle managers and others employees in the company. This was done to gain further supportive information and to clarify some specific aspects related to the topic.

The distribution of the questionnaire was done in such a way that there would be respondents from all organisational levels of Banagas. It would encompass Top management, Middle management, Line managers and the employees. This way of distribution eased the comparative analysis of the response between the different levels of the organisation.

Chapter Five

Results and Analysis

This part of the study presents the results of the gathered data within the frame work of the selected main factors detailed in chapter four. Findings are presented in two formats to answer the 8 research questions. First, the descriptive format focuses on the macro analysis of the Quality Assurance System and its cultural requirements in Banagas. Second, the comparative format measuring the degree of correlation across the four organisational levels in Banagas.

5.1 Review of the Sample Selected

The randomly selected sample consisted of 91.43% male and 8.57% female, among whom 80% of were within the age group of 31-40, 12.86% were of age 41 and over, and 7.14% were of an age group of 21-30. 95.71% of them were Bahraini and 4.29% non-Bahraini. 67.14% were college or University graduates, 28.57% had secondary certificate qualifications and 4.29% possessed masters' or doctoral degrees.

81.43% of the sample had more than five years' experience in the company. While the rest (18.57%) had an experience of between 1-5 years. Their current positions ranged from top management (10%), middle managers (15.72%) line managers (17.14%) and employees (57.14%). It seemed from their duration in the positions, i.e., 75.71% had 1-5 years, and the company followed the rotation policy which gave an opportunity to each one to acquire experience on the one hand and develop their status on the other.

Table 1 : General Information

Item	Number	Percentage
1- Sex:		
male	64	91.43%
female	6	8.57%
2- Age:		
20 or less	-----	-----
21-30	5	7.14%
31-40	55	80%
40 and over	9	12.86%
3- Nationality:		
Bahraini	67	95.71%
Non-Bahraini	3	4.29%
4- Educational level:		
Secondary school	20	28.57%
College/University Grad.	47	67.14%
Master/Doctoral Degree	3	4.29%
5- How long have you been with the organisation?		
less than 1 year	-----	-----
1-5 years	13	18.57%
More than 5 years	57	81.43%
6- How long have you been in your position?		
less than 1 year	5	7.14%
1-5 years	53	75.71%
More than 5 years	12	17.14%

5.2 Data Presentation in Descriptive Format.

5.2.1 The Existing Quality System

An important ingredient to the success or failure of a quality system is the willingness and ability to commit to and implement the program until the quality is achieved. As Deming pointed out, the change to a quality organisation requires that “management must awaken to the challenge, must learn their responsibilities, and take on leadership for a change”. Most of the respondents (88.57%) in item 8 were satisfied to a large extent with the support from the management. The highest mean in the response was (4,9) and the smallest variance was 0.91.

Table 2 : The Quality System Management support

Response	Number	Percentage
Fairly often	8	11.43%
To a large extent	62	88.57%

Claus Møller (1988) clearly defined quality goals as one of the 17 hall-marks of a quality company. The results showed that a majority of 81.43% felt satisfied to a lesser extent with the company's regularity for defining policies and goals to be achieved with a mean average of 4.186.

Table 3 : Define policies and goals

Response	Number	Percentage
Fairly often	57	81.43%
Always	13	18.57

Item 10 shows the top management effectiveness in asking for results from previously defined goals. The observation shows that 70% of the respondents indicated that the

top management were always asking for results and 30% management often asked for results.

Table 4 :Effectiveness in Asking for results

Response	Number	Percentage
Often	21	30%
Always	49	70%

A part of the quality awareness is the discussion of Quality Issues. In item 11, 60% of the respondents were always discussing quality issues and 40% often discussed the quality issues. It was found (Item 12) that 90% of the respondents discussed quality issues with the Quality management representative or Quality co-ordinator, whereas 60% of the respondents discussed them with colleagues, and the same number discussed them with the manager and with colleagues in the other departments. 5.7% of the respondents discussed quality issues with colleagues in other companies.

Table 5 : Discuss the Quality Issues.

Response	Number	Percentage
Often	28	40%
Always	42	60%

Table 6 : With whom they discussed the Quality Issues.

Response	Number	Percentage
a) with colleagues	42	60%
b) with manager	42	60%
c) with colleagues in other depts.	42	60%
d) with the Quality management representative/Quality co-ordinator	63	90%
e) other	4	5.7%

Items 13 and 15 question the degree is the respondents involvement in the QMS.

The results showed that 66% of the respondents were extensively involved in the QMS. 24% were less extensively involved and 10% were fairly involved in the Quality Management System. The findings were that 81% were involved in writing their departmental procedures and 19% were not been involved in the writing of procedures. In general, it appears that a large majority of the Banagas personnel have in some way or the other been involved in the QMS or the writing of the departmental procedures.

Table 7 : Involvement in the Quality Management System.

Response	Number	Percentage
Fairly	7	10%
Less extensive	17	24%
Extensively	46	66%

Table 8 : Involvement in writing your departmental procedures

Response	Number	Percentage
Yes	57	81%
No	13	19%

Table 9 indicates the various benefits that are expected from obtaining the certification of the ISO-9002. Here the reinforcement of customer confidence appeared to be favoured by the most (75.71%) followed by the clarification of duties and responsibilities (71.43%) and finally ensuring the support and thus the commitment of the employees (70%).

Table 9 : Benefits from certification of QMS

Response	Number	Percentage
a) Reinforce customer confidence.		
- fairly	3	14.29%
- less extent	14	20%
- large extent	53	75.71%
b) Ensure support & thus the commitment of all employees.		
-slightly	2	2.86%
-less extent	19	27.14%
- large extent	49	70%
c) Clarify the duties & responsibilities of all employees through effective & efficient systems or procedures.		
- less extent	20	28.57%
- large extent	50	71.43%

In general, it appears that all the benefits examined have been perceived to be of large importance but as indicated above the reinforcement of customer confidence scored the highest.

Item 16 (Table 10) shows the QMS's contribution to the profitability of the company. Regarding this 50% of the respondents agreed that the QMS contributed to a large extent to the profitability of the company. Where as 41.43% felt that it contributed to a less extent. An overall assumption would be that all the respondents agreed that the QMS contributes to the profitability of the organisation.

Table 10: Contribution to Profitability

Response	Number	Percentage
fairly	6	8.57%
less extent	29	41.43%
To large extent	35	50%

The overall effectiveness of the Quality System is monitored through assessing the results of internal Quality Audits. It is a primary requirement in the QAS (Clause 17). Item 17 (table 11) of the questionnaire indicates the effectiveness of the Internal Quality Audit in the company. A large majority (80%) of the respondents showed that the Internal Quality Audit was very effective.

Table 11: Effectiveness of Internal Quality Audit program.

Response	Number	Percentage
Fairly effective	4	5.71%
Less extent	10	14.29%
To a large extent	56	80%

The job description not only defines the place of the job in the organisation but also clarify for the job holders and others the contribution the job makes to achieving organisational and departmental objectives. This in turn further contributes to the understanding of and commitment to the responsibilities of the QAS. In item 18 (Table 12), the majority (78.57%) felt that their jobs were clearly defined where as 4.29% felt that their jobs were fairly defined.

Table 12: Clear Job Definition

Response	Number	Percentage
Fairly	3	4.29%
Less extent	12	17.14%
To a large extent	55	78.57%

To ensure that continual improvement is ongoing and that action to prevent non-conformance, the corrective and Preventive Action is an essential ingredient in the QMS. Here it is found that the company has a very quick responsive to any deficiencies or errors with a large score of 82.86% of the respondents saying so.

Table 13: Responsiveness to any deficiencies or errors

Response	Number	Percentage
Fairly	3	4.29%
Quick	9	12.86%
Very Quick	58	82.86%

5.2.2 Quality Culture and Change

Developing a supportive organisational culture is critical to success as well as a prerequisite of major quality improvement effort as stressed by quality gurus (Juran and Deming). For the company to have full commitment from all the employees the quality standard has to be embedded in the company's culture.

At the heart of initiating any change program as is the case with introducing a QAS, management writers like J. Oakland and M. Armstrong put the development of a mission statement at the forefront of such a change program. To gain commitment from the employees to the mission statement they should understand of the

company's mission statement. Here 78.57% understand the company's mission statement very clearly and a low percentage of 1.43% understand it fairly clearly.

Table 14: Clear understanding mission key objectives

Response	Number	Percentage
Fairly	1	1.43%
Clear	14	20%
Very clear	55	78.57%

John P. Kotter and James L. Heskett in "Corporate culture & performance" say that to produce the needed change the company has to communicate their mission, vision and strategies in order to obtain understanding and commitment for a wide range of the mission statement. 50% of the respondents state that the company fairly often communicates its mission statement.

Table 15: Communicate it's mission and key objectives

Response	Number	Percentage
Sometimes	8	11.43%
fairly often	38	50%
frequently	27	38.57%

An overall statement on items 20 & 21 (Table 14 & 15) is that the majority of the employees, i.e., 78.57% understand the mission statement, although the company is

not putting enough effort on the communication of the mission statement to allow the rest of the employees to fully understand the statement.

A successful QMS will involve all the employees and requires that everyone must take ownership for the quality of his work. Table 16 indicates the management's insistence on the employees accepting personal responsibility for the quality of their work.

Table 16 : employees accepting personal responsibility for the quality of their work.

Response	Number	Percentage
Not at all	2	2.86%
Sometimes	14	29%
fairly often	7	10%
frequently	47	67.14%

Respondents were asked about recognition and reward for exceptional performance. The results showed that 58.57% felt that the organisation encouraged recognition & reward.

Table 17 : Encourage recognition and reward for exceptional performance.

Response	Number	Percentage
Once in a while	8	11.43%
Fairly often	21	30%
Frequently	41	58.57%

Question 24 (Table 18) was about making constructive criticism when performance was not up to the standard. Here a majority of 50% agreed that it “ fairly often” happens in the company and a minority of 14.29% felt that it happened “ Once in a while”.

Table 18 : Constructive criticism when people performance is not up to standard.

Response	Number	Percentage
Oncc in a while	10	14.29%
Sometimes	14	20%
Fairly often	35	50%
Frequently	11	15.71%

Open communication and accessibility between the manager and the employee reinforces employee motivation. The answers to question 24 shows that 47.14% agree that the managers fairly often encourage open communication. 10% of the respondents feel that it is only once in a while.

Table 19 : Open communication and accessibility.

Response	Number	Percentage
Oncc in a while	7	10%
Sometimes	9	12.86%
Fairly often	33	47.14%
Sometimes	21	30%

Having an established formal internal program for evaluation of staff performance is the corner stone for having a successful & fair reward system. The response to item 26 (Table 19) was that 44.28% of the respondents felt that Banagas had an internal evaluation program to a “lesser extent”.

Table 20: Formal internal programme for evaluation of staff performance.

Response	Number	Percentage
Fairly	11	15.17%
Less extent	31	44.28%
To a large extent	28	40%

Banagas used the Quality Bulletin (AL SHOALA) as one of the means to raise employee awareness on Quality issues. Table 21 shows the respondents’ views on how effective the Quality Bulletin is in providing the information that apply to the employees. The responses shows that a majority of 58.57% feel that the Bulletin is “fairly effective” in providing the necessary information.

Table 21: Quality Bulletin.

Response	Number	Percentage
Fairly effective	41	58.57%
Effective	8	11.43%
Very effective	21	30%

Table 22 shows the results of the question on the criteria and procedure for recruiting new candidates. 61.43% of the respondents agree “to a large extent” that the

company has criteria and procedure for the selection of new recruits. It is also noticed that a fair number of respondents, i.e., 30% feel that the criteria and procedure are “fair”.

Table 22 : Criteria and procedure for the selection of candidates with suitable skills and improvement potential.

Response	Number	Percentage
Fairly	21	30%
Less extent	43	61.43%
To a large extent	6	8.57%

A training program which responds to employee tasks is a key mechanism in an organisation’s culture. Question 29 is about the training program. Here the results shows that 45.71% (Table 23) of the respondents feel that the company trains employees to respond to their tasks. The respondents were also asked to indicate their opinion on the statement: “ The organisation has a good reputation amongst the employees as a provider of good quality training and development”. The results showed that 40% (Table 24) indicated that they felt it was “to a large extent”.

Table 23: Trained organisation to respond to required tasks.

Response	Number	Percentage
Occasionally	15	21.43%
Often	23	32.86%
Always	32	45.71%

Table 24 : Employees as a provider of good quality training and development.

Response	Number	Percentage
Occasionally	7	10%
Fairly	8	11.43%
Less extent	27	38.57%
To a large extent	28	40%

Table 25 & 26 show the results of team work in Banagas. Question 31 asks if team work is fostered in the organisation. The results show that 70% of the respondents agree “to a large extent” that it exists in the organisation. Where as question 32 inquires about information, tools and training given to the teams to do their work effectively. Table 26 shows that 48.57% feel to a “lesser extent”, and 30% feel that it is “fairly” given.

Table 25 : Team work.

Response	Number	Percentage
Fairly	10	14.29%
Less extent	49	70%
Large extent	11	15.71%

Table 26 : information, tools and training they need to do the job effectively.

Response	Number	Percentage
Fairly	22	31.43%
Less extent	34	48.57%
Large extent	14	20%

Item 33 asks about Quality Circles to “discuss quality issues after work hours”. The results shows that 54.28% practise it sometimes and 32.86% practise it once in a while.

Table 27 : Quality issues after work hours.

Response	Number	Percentage
Once in a while	23	32.86%
Sometimes	38	54.28%
Regularly	9	12.86%

5.2.3 Summary of Data Presentation: Descriptive format.

The Existing QMS.

Banagas management support the Quality Assurance System in that they are committed to their responsibilities. The company’s short-fall is its regularity in defining policies and goals to be achieved. The employees awareness of the Quality Assurance System is fairly high with 60% of them taking part in discussions on Quality issues whether within the company or outside.

In regard to the employee involvement in the QMS, Banagas has involved 65.7% of its staff “extensively”. It is also seen that a majority of the staff are involved in it at least in writing their departmental procedures. This reflects the importance of the employee involvement in the company’s agenda.

The benefits of the Quality Standard certification is clearly understood by the majority of the respondents, although with respect to the QMS as contributing to the profitability of the organisation the majority is not clear. The clarification of duties and

responsibilities of all employees as a benefit is also reinforced by the majority of 78% of the respondents agreeing that their jobs are clearly defined.

The company's Internal Quality Audit is seen to be very effective according to the respondents. The results show that the corrective / preventive Action is very quick in responding to errors or in preventing errors.

The results show that a majority of 78.6% understand the company's mission statement, although 50% feel that the communication of the mission statement is done "fairly often".

Commitment to the QMS from the employees requires the employees to feel that they own the system. It requires the management to insist on the employees accepting responsibility for the quality of their work. The respondents agree that the management requires them to accept responsibility although when it comes to making constructive criticism the response was that the management "fairly often" offered constructive criticism.

While the Banagas management encourage recognition and reward for exceptional performance the respondents' show that the majority of 44% feel "to a less extent" about the company's formal internal program for an evaluation of staff performance.

Banagas management "fairly often" encourage open communication and accessibility. The Quality Bulletin (AL-SHOALA) is "fairly effective" in providing the necessary information that applies to the employees.

Dobson in "Changing Culture" describes that organisations have sought to change culture by shaping beliefs, values and the attitudes of employees. He names policies on recruitment, selection and redundancy and "change employees' beliefs about their

capabilities through training in new skills “ as being two of the five key mechanisms upon which culture change program initiated by the case study companies have depended. The results show that Banagas has a criteria and procedure for the selection of candidates “to a less extent “ with 61.43% of the respondents agreeing to it. About the organisations’ training program, the majority of the respondents show that they agree with the company’s training program and with the statement that the company is a “ provider of good quality training and development.”

The team work in the organisation is not well developed as 70% of the respondents show that the team work is formed “to a less extent.” The company also provide information, tools and training to the teams to do their jobs effectively to a lesser extent. Quality Circles are also developed to a lesser extent with the majority of 54.3% agreeing that they sometimes discuss Quality issues after work.

5.3 Data presentation in Comparative format:

The comparative analysis as mentioned in chapter 4 involves comparing the results of the different organisational levels. It is the interaction of the people in order to achieve objectives which form the basis of the organisation. In order to successfully implement a program like QAS and thus achieve the change required there has to be uniformity in the belief in the system or program. The sample selected contains:

Type of organisation level	Number of cases	Percentage
Top management	7	10%
Middle management	11	15.72%
Line management	12	17.14%
Employees	40	57.14%
Total	70	100%

With regard to the extent of management support (question 8) it is seen that the majority of the respondents at different levels think that the management “To a large extent” supports the QAS. The highest percentage (100%) being in top management level and the lowest percentage (83.3%) in the line managers, although when looking at the company’s regularity in defining policies and goals to be achieved (question 9), the majority believe that it is done “fairly often”. The top management recorded the lowest percentage of 71.43% followed by the second lowest percentage by the middle management (81.8%). The highest percentage is in the line managers with (83.3%).

Cross tabulation: 8

Management Type	Fairly often		To a large extent	
	N°	%	N°	%
Top Management	----	-----	7	100%
Middle Management	1	9%	10	91%
Line Managers	2	16.7%	10	83.3%
Employees	4	105	36	90%
Total	7	10.0%	63	90.0%

Cross tabulation: 9

Management Type	Fairly often		Always	
	N°		N°	
Top Management	5	71.34%	2	28.6%
Middle Management	9	81.8%	2	18.2%
Line Managers	10	83.3%	2	16.7%
Employees	33	82.5%	7	17.5%
Total	57	81.4%	13	18.6%

Regarding question 10 which asks about the extent of top management' effectiveness in asking for the results concerning defined goals, the majority's response was that it was "always" effective. The highest percentage was in top management and the lowest score was in the line managers.

cross tabulation: 10

Management Type	Often		Always	
	N°	%	N°	%
Top management	1	14.3%	6	85.7%
Middle management	3	27.3%	8	72.7%
Line managers	5	41.7%	7	58.3%
Employees	12	30%	28	70%
Total	21	30.0%	49	70.0%

The results of item 11 show that the middle managers always discuss Quality Issues with a score of 81.81%. It is seen that the employees also discuss Quality Issues “always” with a second highest score of 62.5%. The line managers and Top management level discuss Quality issues less regularly “often” with percentages of 58.37% and 57.14% respectively.

Cross tabulation: 11

Management type	Often		Always	
	N°	%	N°	%
Top management	4	57.14%	3	42.85%
Middle management	2	18.18%	9	81.81%
Line managers	7	58.33%	5	41.66%
Employees	15	37.5%	25	62.5%
Total	28	40.0%	42	60.0%

Reviewing the results about involvement in the QMS (Item 13) we find that the highest percentage of involvement is in the middle management level (81.81%) followed by the Top management (71.42%). The lowest involvement is the line managers level.

Cross tabulation: 13

Management type	Fairly		Less extensive		Extensively	
	N°	%	N°	%	N°	%
Top management	1	14.28%	1	14.28%	5	71.42%
Middle management	1	9.09%	1	9.09%	9	81.81%
Line managers	1	8.33%	5	41.66%	6	50%
Employees	4	10%	10	25%	26	65%
Total	7	10.0%	17	24.3%	46	65.7%

Cross tabulation 14A asks the question as to what extent the reinforcement of customer confidence the QMS provide in the view of the respondents. The Top management agree to a large extent that it does (85.71%) followed by the employees (80%). Third are the line managers with 75% of them agreeing “to a large extent”.

Observing the results of item 14B we notice that with regard to the benefits of QMS as ensuring the support and thus the commitment of all the employees the line managers support the statement the highest with 91.66% followed by the Top managers and the lowest are the employees with 62.5%.

The benefit of clarifying the duties and responsibilities (item 14C) is supported mostly by the top management level (85.71%). The employees and middle managers are second and third scoring 75% and 72.72% respectively. The line managers are the lowest with 58.33%.

Cross tabulation: 14A

Management type	Fairly		Less extent		Large extent	
	N°	%	N°	%	N°	%
Top management	1	14.28%	---	---	6	85.71%
Middle management	---	---	5	45.45%	6	54.54%
Line managers	---	---	3	25%	9	75%
Employees	2	5	6	15%	32	80%
Total	3	4.3%	14	20.0%	53	75.7%

Cross Tabulation : 14 B

Management type	Slightly		Less extent		Large extent	
	N°	%	N°	%	N°	%
Top management	---	---	1	14.28%	6	85.71%
Middle management	---	---	3	27.27%	8	72.72%
Line managers	---	---	1	8%	11	
Employees	1	2.5%	14	35%	25	62.5%
Total	1	1.4%	19	27.1%	50	71.4%

Cross Tabulation : 14 C

Management type	Less extent		Large extent	
	N°	%	N°	%
Top management	1	14.28%	6	85.71%
Middle management	3	27.27%	8	72.72%
Line managers	5	45.45%	7	58.33%
Employees	10	25%	30	75%
Total	19	27.7%	51	72.9%

With regard to the system's contribution to the Profitability of the organisation the results show that the distribution is evenly spread between a "lesser extent" and "to a large extent". The highest score was contributed by the top management (57.14%) with the lowest being in the middle management which was 45.45% believing that the system contributes "to a lesser extent" to Profitability.

Item 17 questions the effectiveness of the Internal Quality Audit program. The program's effectiveness was fully supported by the line managers 100% with the second majority support being from the top management level. The middle managers were the lowest majority support with 54.54% agreeing that the program is effective "to a large extent".

Cross tabulation: 17

Management type	Fairly effective		Less extent effective		Very effective	
	Nº	%	Nº	%	Nº	%
Top management	---	---	1	14.28%	6	85.71%
Middle management	----	----	5	45.45%	6	54.54%
Line managers	----	----	-----	----	12	100%
Employees	4	10%	4	10%	32	80%
Total	4	5.7%	10	14.3%	56	80.0%

Clear job description for the different levels of management is a key item for job effectiveness. Item 18 asks about the extent of clear definition of jobs in the organisation. The top management feel that their jobs are very clearly defined with 100% support. The employees are second with 80% with the lowest support coming from the line managers (66.66%).

Cross tabulation: 18

Management type	Fairly		Less extent		To a large extent	
	Nº	%	Nº	%	Nº	%
Top management	----	----	----	----	7	100%
Middle management	----	----	3	27.27%	8	72.72%
Line managers	1	8.33%	3	25%	8	66.66%
Employees	2	5%	6	15%	32	80%
Total	3	4.3%	12	17.1%	55	78.6%

Cross tabulation 19 shows the results for the company's responsiveness to any deficiencies or errors in the system. Middle managers are the most that agree that the company's response is "very quick" (90.9%). The second are the top managers with 85.71%, the employees are the least with a percentage of 80%.

Cross tabulation: 19

Management type	Fairly		Quick		Very quick	
	N°	%	N°	%	N°	%
Top management	---	---	1	14.28%	6	85.71%
Middle management	---	---	1	9.1%	10	90.9%
Line managers	1	8.33%	1	8.33%	10	83.33%
Employees	2	5%	6	15%	32	80%
Total	3	4.3%	9	12.9%	58	82.9%

Culture, change and future Improvement:

Item 20 and 21 deal with the company's mission statement. Question 20 asks the respondents about their understanding of the mission statement. 85.71% of the top management level understand the statement "very clearly", where as the line managers show a lower percentage of 75%. The company's communication of the mission statement is covered by Question 21. Middle managers are the most (54.54%) who agree that the company "fairly often" communicates its mission statement. The second highest score is by the line managers and employees half of both of them 50% agreeing that it happens "fairly often".

Cross tabulation: 20

Management type	Fairly clear		Clear		Very clear	
	N°	%	N°	%	N°	%
Top management	---	---	1	14.28%	6	85.71%
Middle management	---	---	2	18.18%	9	81.81%
Line managers	1	8.33%	2	16.66%	9	75%
Employees	---	---	9	22.5%	31	77.5%
Total	1	1.4%	14	20.0%	55	75.6%

Cross Tabulation : 21

Management type	Sometimes		Fairly often		Frequently	
	N°	%	N°	%	N°	%
Top management	1	14.28%	3	42.85%	3	42.85%
Middle management	---	---	6	54.54%	5	45.45%
Line managers	1	8.33%	6	50%	5	41.66%
Employees	6	15%	20	50%	14	35%
Total	8	11.4%	35	50.0%	27	38.6%

The management's insistence on employees accepting personal responsibility for the quality of their work (Item 22) shows that 81.81% of the middle managers feel that is practised to a large extent. The lowest score is by the line managers in which 50% of

them show that it is practised to a large extent whereas the other half show that it is practised "sometimes".

Cross tabulation: 22

Management type	Not at all		Sometimes		Fairly often		Frequently	
	N°	%	N°	%	N°	%	N°	%
Top management	1	14.28%	---	---	1	14.28%	5	71.42%
Middle management	---	---	2	18.18%	---	---	9	81.81%
Line managers	---	---	6	50%	---	---	6	50%
Employees	1	2.5%	6	15%	6	15%	27	67.5%
Total	2	2.9%	14	20.0%	7	10.0%	47	67.1%

J. Juran, Tom Peters and Crosby are some of the authors who emphasise the importance of recognition and reward for a Quality program. The results to question 23 show that the middle managers are the highest percentage (90.90%), agreeing that recognition and reward for exceptional performance is practical " frequently ". The employees' results show that they have the least agreeable with the middle management showing 62.5% agreeing that it is practised "frequently".

Cross tabulation: 23

Management type	Once in a while		Fairly often		Frequently	
	N°	%	N°	%	N°	%
Top management	---	---	1	14.28%	6	85.71%
Middle management	3	27.27%	7	63.63%	1	9.1%
Line managers	---	---	3	25%	9	75%
Employees	5	12.5%	10	25%	25	65.5%
Total	8	11.4%	21	30.0%	41	58.6%

Item 24 asks about whether constructive criticism is made to the employees who do not achieve the standard required. The majority of the respondents show that they agree it is carried out “fairly often”. The highest majority (58.33%) is shown in the line managers level while the lowest (36.36%) is shown by the middle management.

Cross tabulation: 24

Management type	Once in a while		Sometimes		Fairly often		Frequently	
	N°	%	N°	%	N°	%	N°	%
Top management	---	---	---	---	4	57.14%	3	42.85%
Middle management	3	27.27%	2	18.18%	4	36.36%	2	18.18%
Line managers	1	8.33%	3	25%	7	58.33%	1	8.33%
Employees	6	15%	9	22.5%	20	50%	5	12.5%
Total	10	14.3%	14	20.0%	35	50.0%	11	15.7%

According to Crosby (14 steps to Quality Improvement) there are “Absolutes that should be defined, understood and communicated to every member of the organisation.” One of the fourteen points is to “ Encourage employees to communicate to management the problems they are facing to achieve their goals. Item 25 asks whether open communication is encouraged by managers/supervisors in the organisation. The results show that the majority in the different levels indicate open communication is encouraged “fairly often”.

The Top management present the highest percentage (57.14%) with the second highest being the middle management (54.54%). The lowest percentage is recorded by the employees resulting in 42.5%.

Cross tabulation: 25

Management type	Once in a while		Sometimes		Fairly often		Often	
	N°	%	N°	%	N°	%	N°	%
Top management	1	14.28 %	1	14.28 %	4	57.14%	1	14.28%
Middle management	---	---	---	---	6	54.54%	5	45.45%
Line managers	---	---	2	16.66 %	6	50%	4	33.33%
Employees	6	15 %	6	15 %	17	42.5%	11	27.5%
Total	7	10.0 %	9	12.9 %	33	47.1%	21	30.0%

The effectiveness of the organisation's Quality Bulletin in providing the required information is shown in cross tabulation 27. The results show that the majority of all the organisational levels agree that the Bulletin is "fairly effective". The highest percentage (81.81%) is second in the middle manager's level with the lowest (52.5%) is recorded by the employees.

Cross tabulation: 27

Management type	Fairly effective		Effective		Very effective	
	N°	%	N°	%	N°	%
Top management	4	57.14%	1	14.28%	2	28.27%
Middle management	9	81.81%	--	---	2	18.18%
Line managers	7	58.33%	1	8.33%	4	33.33%
Employees	21	52.5%	6	15%	13	32.5%
Total	41	58.6%	8	11.4%	21	30.0%

In order to recognise and reward employees for exceptional performance an evaluation program is required. Item 26 inquires about the organisation's evaluation program.

Results show that the top management level and line managers agree that the evaluation program exists "to a large extent". The top management is the highest percentage of 57.14% followed by the line managers (50%). The middle managers and line managers show that is present "to a less extent". The lowest percentage is in the middle management (45.45%).

Cross tabulation: 26

Management type	Fairly		Less extent		To a large extent	
	N°		N°		N°	
Top management	---	----	3	42.58%	4	57.14%
Middle management	3	27.27%	5	45.45%	3	27.27%
Line managers	2	16.66%	4	33.33%	6	50%
Employees	6	15%	19	47.5%	15	37.5%
Total	11	15.7%	31	44.3%	28	40.0%

In "A Passion for Excellence", Tom Peters identified three major areas in the pursuit of "excellence". One of the three areas is People. The management of the inflow and the outflow of staff is quality culture and to have committed staff management of Human Resources plays a major part. At the heart of the Human resource management is the selection of new recruits. Item 28 asks about the extent the company has of criteria for selection of new candidates.

The majority in each organisation level show that the company has a criteria "to a lesser extent". The level with the highest majority (71.42%) are the top managers and the lowest majority (50%) are the line managers.

Cross tabulation: 28

Management type	Fairly		Less extent		Large extent	
	N°	%	N°	%	N°	%
Top management	1	14.28%	5	71.425	1	14.28%
Middle management	4	36.86%	7	63.63%	----	-----
Line managers	5	41.66%	6	50%	1	8.33
Employees	11	27.5%	25	62.5%	4	10%
Total	21	30.0%	43	61.4%	6	8.6%

Tom Peters in “Thriving on Chaos” (1987) emphasises the training of the staff.

Peters has suggested that organisations should “Invest in human capital”, “train entry level people; retrain them as necessary” and train them after any promotion.

Cross Tabulation 29 shows the results of the question as to what extent does the company train the staff to respond to their tasks. The results show that the top managers with the highest percentage (85.71%) agree that training takes place “to a large extent”. The lowest majority is in the middle management scoring 36.36% in both “to a lesser extent” and “to a large extent”.

Cross tabulation: 29

Management type	Occasionally		Often		Always	
	N°		N°		N°	
Top management	---	-----	1	14.28%	6	58.71%
Middle management	3	27.27%	4	36.36%	4	36.36%
Line mangers	3	25%	8	66.66%	1	8.33%
Employees	9	22.5%	10	25%	21	52.5%
Total	15	21.4%	23	32.9%	32	45.7%

Question 30 asks about the respondents' opinion on the organisation being a provider of good quality training and development. The results show that the three managerial levels (top, middle and line) agree with the statement "to a large extent". The highest score is in the top management level with 57.14%. The employees agree with the statement "to a lesser extent" with a percentage of 40%.

Cross tabulation: 30

Management type	Occasionally		Fairly		Less extent		To a large extent	
	Nº	%	Nº	%	Nº	%	Nº	%
Top management	1	14.28%	----	-----	2	28.57%	4	57.145
Middle management	1	9.1%	1	9.1%	4	36.4%	5	45.4%
Line managers	---	----	1	8.33%	5	41.66%	6	50%
Employees	5	12.5%	6	15%	16	40%	13	32.5%
Total	7	10.0%	8	11.4%	27	38.6%	28	40.0%

Item 31, 32 & 33 of the questionnaire inquire about the existence of team work in the organisation. The statement "Everyone.....involved in the Quality program" suggest that the whole organisation should support and apply the Quality program. This would require from the organisation to encourage team work.

Looking at the results of item 31 (cross tabulation 31) it is found that 85.71% of the top management agree that team work is formed "to a less extent". Followed by the employees with 72.5% agreeing team work exists in the company. The lowest majority is the line managers with 58.33% agreeing.

Cross tabulation: 31

Management type	Fairly		Less extent		Large extent	
	N°	%	N°	%	N°	%
Top management	----	----	6	85.71%	1	14.28%
Middle management	2	18.18%	7	63.63%	2	18.18%
Line managers	3	25%	7	58.33%	2	16.66%
Employees	5	12.5%	29	72.5%	6	15%
Total	10	14.3%	49	70.0%	11	15.7%

Question 32 asks whether the organisation provides the teams with the information, tools and training to do the job effectively. The results (cross tabulation 32) show that the employees agree “to a lesser extent” with the highest majority of 57.5% whereas the second majority of middle managers (54.5%) agree that it “fairly” exists.

Cross tabulation: 32

Management type	Fairly		Less extent		Large extent	
	N°	%	N°	%	N°	%
Top management	2	28.6%	2	28.6%	3	42.8%
Middle management	6	54.5%	3	27.3%	2	18.2%
Line managers	5	41.6%	6	50%	1	8.4%
Employees	9	22.5%	23	57.5%	8	20%
Total	22	31.4%	34	48.6%	14	20.0%

Ishikawa's teachings suggest that for a successful Quality program to be implemented the organisation has to encourage the formations of Quality circles.

Item 33 asks if the respondents get together to discuss Quality Issues. The results show that the majority "sometimes" assemble to discuss quality issues, the line managers having the highest majority of 58.3% whereas the lowest majority of "sometimes" are the middle managers (54.5%). The top management discuss quality issues "once in a while" with a majority of 57.1%.

Cross tabulation: 33

Management type	Once in a while		Sometimes		Regularly	
	N°	%	N°	%	N°	%
Top management	4	57.1%	2	28.6%	1	14.3%
Middle management	4	36.4%	6	54.5%	1	9.1%
Line managers	3	25%	7	58.3%	2	16.7%
Employees	12	30%	23	57.5%	5	12.5%
Total	23	32.9%	38	54.3%	9	12.9%

5.3.1 Summary of Data Presentation in Comparative Format.

The Existing QMS

In general the company's management responsibilities towards the QMS show that a majority of the management at different levels agree that there is strong support from the top management. With regard to regularity in defining the policies and goals line

managers are the least agreed as to the effectiveness of the top management in asking results for defined goals. The highest score came from the top management.

The middle management and the employees are the most who discuss quality issues (81.8% and 62.5% respectively). The top management are the least majority and they “often” discuss quality issues.

All the management levels & the employees are extensively involved in the QMS, the lowest percentage marked by the line managers.

Regarding the benefits of the QMS it is most noticeable that the line managers are the lowest majority in agreeing that it clarifies the duties & responsibilities of all employees. The employees level show the lowest majority as agreeing that the QMS ensures the support and commitment of all employees. About the contribution to profitability of the organisation the middle management are the least agreed.

The internal Quality Audit program is supported fully (100%) as being very effective by the line managers with the middle management scoring the lowest majority of 54.5%.

The Banagas clarity of Job definition is supported by all organisational levels as practised “ to a large extent “. The lowest score is recorded at the line managers level (66.7%).

The company’s responsiveness to correction / prevention to deficiencies or errors is acknowledge by all levels as being “ very quick”.

Culture, change and future Improvement.

The majority in all levels agree that the company’s mission statement is understood by them but about the communication of the mission statement it is agreed

by the majority in all the levels that it is communicated “fairly often”. The least majority is recorded by the top management with 42.8%.

The management in Banagas insist on employees accepting personal responsibility for the quality of their work. The majority of the organisational levels show that it is “frequently” practised with the exception of the line managers whose 50% agree that it is “frequently” practised and the other half feel that it is “sometimes” practised. Constructive criticism is “fairly often” practised with the least agreement at the middle management level.

The company’s encouragement of recognition and reward for exceptional performance is agreed to by all levels of organisation as being frequently practised with the exception of the middle management who feel that it is “fairly often” practised.

A formal internal program for the evaluation of staff performance is regarded by the top management and line management as being practised “to a large extent “. The middle management and employees feel that it is practised “to a lesser extent”.

Open communication is encouraged “fairly often” according to the results of all organisational levels. The lowest majority result is from the employees (42.5%). The quality bulletin shows fair effectiveness in providing the necessary information that applies to employees according the middle, line managers and the employees.

The results show that the criteria of selection of new candidates is practised with a “less extent “ in the company. The least majority that agree that it is to a lesser extent are the line managers 50%. It is seen that 41.66% of the line managers think it is fairly practised. The line managers and middle managers show that the employees are trained “often” to respond to required tasks. The employees are the least that agree about the company acting to provide to good quality training and development.

Team work is agreed to by all the organisational levels that it is formed to a less extent. The line managers are the least majority and the top managers are the most majority. With regard to the teams the middle managers agree that it is done fairly.

Chapter Six

Conclusion and Recommendations

6.1 Introduction

The main objective of this study was to assess the implementation of the Quality Assurance system in the Bahrain National Gas Company (Banagas). Before concluding the findings of this study it is relevant to discuss the trend of ISO 9000 certification in the Arabian Gulf region. According to Chris Mellor, a Quality Auditor working in the region with Det Norske Valley, there are two hypothetical companies that seek ISO 9000 certification. One group is only concerned with “ Get the certificate on the wall” companies and the other is “ Lets work together as a team for this project” companies. It is apparent that Banagas falls in the “ Lets work together as a team.....” group of companies.

The preachings of the different Quality Gurus like Deming, Juran, Crosby and others differ on a few points. It is not important what preacher and approach does a company follow. What is more important is the willingness and ability to commit to and continue the implementation of the approach until quality is achieved. For Banagas to reap the full benefits of the Quality Management System, continuous improvement should be engraved in the company strategy and clearly express the theme of The 3rd Middle East International Quality Assurance Conference (April 1995) “ Quality - a Way of Life”.

6.2 Conclusion

Several conclusions were apparent from this study.

The first clause in ISO 9002 Quality Assurance System requirements under Section 4 defines the Management Responsibilities. This clause requires from the top management to address the quality policy and the management's commitment to the QAS. In Banagas the Quality Assurance System has been initiated by full support from the top management. The top management's support is also shown in the effort the company spent in gaining ownership of the QAS by the majority of staff. The findings reveal that the employee involvement in implementing the Quality Assurance System was very obvious in all employee levels. This is evident in the employees' interest in discussing Quality issues not only with colleagues but also with individuals working in other companies. In addition, the system is regularly reviewed and audited internally by the company Internal Auditors and also by external Auditors (British Standard Institute). The response received from the majority of employees across different levels of management reflects that the Banagas policies and goals to be achieved are not defined as regularly as preferred.

The employees at different levels show a clear understanding of the company's mission statement. It is evident that the employees enjoyed clear job descriptions and were given the responsibility for the quality of their work. Banagas used a powerful tool (Quality Bulletin) to accomplish the level of awareness at which it stands. The Bulletin's role in educating the employees can prove to be the key in the development of quality culture. It is also apparent that the Quality Bulletin (Al Shoala)

in the company gives a slight support to the employees in providing tools required or relevant to their job, this is relayed at the different levels of the organisation.

Implementation of a project like Quality Assurance System requires from Banagas to introduce change in the organisation. This change affects the way the employees work and the procedures in the company. To successfully achieve the implementation of QAS the company needs to focus on the culture of the company. Developing a quality culture is an important ingredient for the successful implementation of a quality programme. The results showed that the cultural aspects need to be addressed in the company. It is apparent that the Banagas mission statement is understood by the majority of employees at all levels of management. The response reveals a lack of communication of the mission statement to the employees at different levels especially in the lower levels of management (line managers and employees). Banagas effectively supports teams in providing information, tools and training required to assist them to do their jobs effectively. However team work in the organisation is not well developed. This is relayed by all organisational levels especially by line managers and employees. Culture deals with peoples beliefs, attitudes and values. To change those beliefs it is important for the company to put emphasise on its education and training programs. The findings show that the company provides good training programmes, although it is observed that a small number of respondents suggested more training to be added to the existing programme.

6.3 Recommendations

The recommendation which are based on this study are as follows:

1. In order for Banagas to ensure continuous quality improvement, the company is required to regularly review its quality programme. To build and assist the employees to pursue personal continuous quality improvements, I recommend that the Quality policies and goals needs to be defined and reviewed on a regular basis to ensure clear understanding by the majority of the employees.
2. The mission statement states what the company is about, where the company is going and the values it adopts to get there. In a continuous quality improvement programme awareness and commitment from all the employees is a vital ingredient in the success of the programme. For Banagas to increase its employee's awareness and commitment the company mission statement should be communicated to all employees more effectively to ensure understanding by the junior employees.
3. Banagas implemented the quality bulletin (Al Shoala) to communicate quality issues and to raise awareness of all the employees. The success of the objective is shown in the results found in the conclusion. Banagas can further more capitalise on the benefits of a company bulletin by expansion of the objectives of the bulletin without incurring additional costs. I recommend that the company Quality Bulletin has to address more Quality related issues and can be used to provide tools and information that assist all employees in enhancing the Quality Assurance System.
4. There were no questions in the survey for finding ways and means for improving the system. The suggestion scheme has already been in implementation since 1986, but it is recommended that the company Internal Quality Auditors be involved thoroughly in enhancing the Quality Assurance System by providing more ideas and

observations that the management can adopt for registering continuous improvement.

APPENDIX 1
QUESTIONNAIRE

Dear Sir,

Please find enclosed a questionnaire for a survey on the practice and implementation of the Quality Management System (ISO 9002) in Banagas. This survey is being conducted as a part of my masters dissertation at the University of Glamorgan - Wales.

The questionnaire is designed to explore the managers' and employees' views on certain issues related to the effectiveness of the QMS and the implementation of the cultural requirements of the QAS in Banagas.

The data and information collected through this questionnaire will be treated with utmost confidentiality and will only be presented in aggregate statistical form.

In the meantime, I would like to thank you in advance for your cooperation and your interest and support for the research.

Yours sincerely,

Ahmed Khalifa Al-Khalifa

PART A : General Information.

1. Sex :
Male [] Female []
2. Age :
20 or less [] 21-30 [] 31-40 [] 41 and over []
3. Nationality :
Bahraini [] Non Bahraini []
4. Educational level :
Secondary School []
College / University Grad. []
Master / Doctoral Degree []
5. How long have you been with the organisation ?
Less than 1 year []
1-5 years []
More than 5 years []
6. What is your current position ?
.....
7. How long have you been in your position ?
Less than 1 year []
1-5 years []
More than 5 years []

PART B: The Quality System (Existing System).

8. In your opinion to what extent do the management support the concept of the Quality Assurance System?

Not at all [1] Once in a while [2] Sometimes [3] Fairly often [4]
To a large extent [5].
9. Do you feel that the company regularly define policies and goals to be achieved

Never [1] [2] [3] [4] [5] Always

10. In your opinion, to what extent is the top management's effectiveness in asking for the results concerning the previously defined goals?

Never [1] [2] [3] [4] [5] Always

11. How often do you discuss Quality Issues ?

Never [1] Occasionally [2] Sometimes [3] Often[4] Always [5]

12. With whom do you discuss the Quality Issues?

- a) with colleagues []
- b) with the manager []
- c) with colleagues in other depts. []
- d) with the Quality management representative/Quality coordinator . []
- e) others.
please specify.....

13. To what extent do you consider is your involvement in the Quality Management System ?

Never [1] Slightly [2] Fairly [3] less extensive [4] extensively [5]

14. To what extent do you agree with the following benefits that are expected from obtaining the certification of the QMS?

a) Reinforce customer confidence. [1] [2] [3] [4] [5]

b) Ensure the support and thus the commitment of all employees. [1] [2] [3] [4] [5]

c) Clarify the duties and responsibilities of all employees through effective and efficient systems or procedures. [1] [2] [3] [4] [5]

15. Have you been involved in writing your departmental procedures?

Yes []

No []

16. Do you feel that the system contributes to the profitability of the organization?

Never[1] [2] [3] [4] [5] to a large extent

17. In your opinion, how effective is the Internal Quality Audit program in the company?
- Not at all [1] Slightly [2] Fairly [3] less effective [4] effective [5]
18. To what extent do you feel that your job is clearly defined?
- Not at all [1] [2] [3] [4] [5] To a Large extent
19. How would you rate the companies responsiveness to any deficiencies or errors in the system?
- Very slow [1] [2] [3] [4] [5] Very quick

Part C : Culture, Change and Future Improvement

20. To what extent do you have a clear understanding of the organisation mission's key objectives?
- Not at all [1] [2] [3] [4] [5] Very clearly
21. Does the organisation communicate its mission and key objectives to all their employees?
- Not at all [1] Once in a while [2] Some times [3] Fairly often [4] Frequently [5]
22. Does the management or supervisors insist on the employees accepting personal responsibility for the quality of their work?
- Not at all [1] [2] [3] [4] [5] Frequently.
23. Does the organisation encourage recognition and reward for exceptional performance ?
- Not at all [1] [2] [3] [4] [5] Frequently.

24. To what extent do you feel that the managers/ supervisors make constructive criticism when peoples performance is not up to the standard ?

Not at all [1] [2] [3] [4] [5] To a large extent.

25. Do the managers/ supervisors encourage open communication and accessibility?

Not at all [1] [2] [3] [4] [5] To a large extent.

26. In your opinion does the organisation have a formal internal programme for the evaluation of the staff performance ?

[1] [2] [3] [4] [5]

27. In your opinion, how effective is the organisation's Quality Bulletin (AL SHOALA) in providing the necessary information that apply to you as an employee ?

Not at all [1] [2] [3] [4] [5] Very effective

28. To what extent does the organisation have criteria and procedure for the selection of candidates with suitable skills and improvement potential.

[1] [2] [3] [4] [5]

29. Are the employees trained by the organisation to respond to required tasks ?

Never [1] [2] [3] [4] [5] Extensively

30. Please indicate your opinion on the following statement:
The organisation has a good reputation amongst employees as a provider of good quality training and development.

Not at all [1] [2] [3] [4] [5] Very Good

31. To what extent has team work been formed in the organisation.

Very minimal [1] [2] [3] [4] [5] To a large extent

32. In your opinion to what extent has your team been given the information, tools and training they need to do the job effectively.

Never [1] [2] [3] [4] [5] Extensively

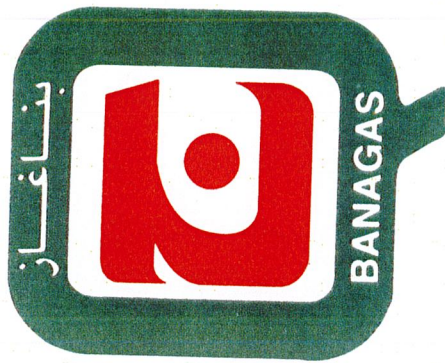
Never [1] once in a while [2] some times [3] regularly [4]
always [5] .

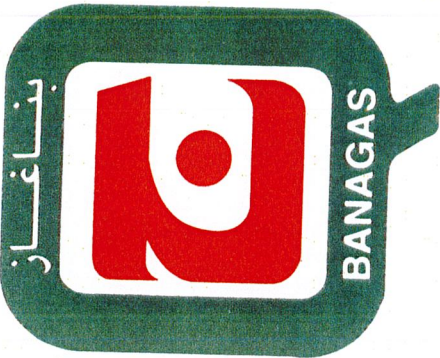
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APPENDIX 2

BANAGAS QUALITY SCOPE

9. ISO 9002



9. ISO 9002 Quality Matrix			
Management Responsibility	4.1	X	Management
Quality System Requirements	4.2	X	Quality
Contract Review	4.3	X	Operations
Design Control	4.4		Eng. & Tech. Services
Document Control	4.5		Maintenance
Purchasing	4.6		Finance
Control of Customer Supplied Product	4.7		Materials
Product Identification & Traceability	4.8		Administration
Process Control	4.9		Management Services
Inspection and Testing	4.10		
Control of Insp., Measuring & Test Eqpt.	4.11		
Inspection and Test Status	4.12		
Control of Non-conforming Product	4.13		
Corrective and Preventive Action	4.14		
Handling, Storage, Packing, Preservation & Delivery	4.15		
Control of Quality Records	4.16		
Internal Quality Audits	4.17		
Training	4.18	X	
Servicing	4.19		
Statistical Techniques	4.20		

APPENDIX 3

BANAGAS QUALITY POLICY

APPENDIX 4

QUALITY COMPETITION DATA

competition number	number of entries
Jan-94	10
Feb-94	18
Mar-94	16
Apr-94	41
May-94	50
Jun-94	70
Jul-94	87
Aug-94	100
Sep-94	145
Oct-94	222
Nov-94	238
Jan-95	196
Feb-95	208
Mar-95	216
Apr-95	220
Jan-96	250
Feb-96	203
Mar-96	211

competition number	% of correct answers
Jan-94	33
Feb-94	28
Mar-94	27
Apr-94	32
May-94	
Jun-94	
Jul-94	38
Aug-94	50
Sep-94	72
Oct-94	69
Nov-94	92
Jan-95	33
Feb-95	69
Mar-95	91
Apr-95	95
Jan-96	97
Feb-96	98
Mar-96	96

APPENDIX 5
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