CHAPTER — III

HISTORICAL BACKGROUND OF ISO, PAPER INDUSTRY AND PROFILE OF THE STUDY AREA
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3. INTRODUCTION

To achieve the general objective as highlighted, the present chapter deals with background of ISO and paper industry, historical development of paper making in general and the present scenario of the study area. This chapter is sub divided into following sections.

Section 1: An evolution of ISO 9000 series of standards, concerning ISO Organization, its quality movement in India. It also logically describes ISO 14001 and its aligned application with quality management systems.

Section 2: It presents a general idea of historical development of paper making, scenario of global and Indian paper industry and its relative methodology applied in the study area as well as the conclusion.

The relative importance of International Standards has greatly increased due to globalization of trade and many other issues like health, safety and environmental protection. The majority of national standardization bodies in industrialized countries are found to be devoted to increase resources. The usage of Internal Standards is well disseminated and implemented by industrial and economic players. The ISO 9000 series sets out the methods that can be implemented in an organization to ensure customers’
requirements correspondingly organization’s requirements both internally and externally at an optimum cost. This is the result of efficient utilization of the available material, human and technological resources. This ultimately leads to managerial effectiveness. By bringing quality in work, managers may develop a sense of feeling that industry as well as they can contribute something positively to the society. Many companies are now seeking registration to quality standard BS 5750 to indicate that they are in control of their businesses, and have proved it with a certifying body. Going in for ISO 9000 registration is found to be a good way of measuring progress and monitoring maintenance of that status lies in the responsibility of managers. It accounts for marketing benefits and human resource developments, but should be started as the beginning of a continuous improvement process as well as human resource rather than the end.

The purpose of improving quality through ISO may accrue to the organization in the form of better quality in production, managerial effectiveness, better employee performance and lesser absenteeism, employee turnover, etc. In many ways, quality represents a blending of these very real concerns for organizational values. In today’s society, with awareness all individuals devote the greater part of their mature lives to work, expending time, energy and physical and mental resources to this endeavor. Moreover, it recognizes that work is the chief determinant of an individual’s freedom, growth and self-respect as well as standard of living. In SPB Ltd, the role of quality is found to be a breadwinner for today’s competitive market which is fundamental for the survival of industry as well as society.
3.1. EVOLUTION OF ISO 9000 SERIES OF STANDARDS

During and after World War II the British Ministry of Defense procurement executive located their ministry inspectors in companies manufacturing defense contracts. Similar practices were there in the USA until 1962. NASA produced a document in which NPC200-2 specified the quality standards for contractors in the space technology program and this led to the introduction of MIL-Q9858 “quality program requirements” in 1963. This document was later modified and adopted by NATO countries as AQAP series. British Ministry of Defence modified it again and introduced it as their Def-Stan 05-20 series of system in 1969. But it is unsuitable for specifying customer requirements in contracts or for the assessment of a supplier’s quality system.

The British Standards Institution published BS 4891 “A Guide to Quality Assurance” in 1972 and BS 5179 “Guide to Quality Systems” in 1975. This made major purchasing organizations to concentrate on their own contractually binding version of manufacturing products or services. The resulting multi-assessments led to a demand for a single national standard in 1979 and the BS5750-series of Quality System Standard was framed.

Following the lead taken by the UK, other national Quality System Standards were introduced in various parts of the world. Many of these were substantive copies of the British Standards Institution with amendments or additional requirements. In 1987 International Standards Organization (ISO) increased its concentration on developing
and published the ISO 9000 series of Quality System Standards. The standard was reviewed and re-issued in July 1994 as ISO 9000: 1994. The second revision was issued on 15 December 2000 in its present version i.e. ISO 9000: 2000. The present study is based on this.

### 3.1.1 Introduction to ISO Organization:

The International Organization of Standardization (ISO) is a world-wide federation of national standards bodies, one from each of approximately one hundred and thirty countries. It started in the electro technical field by keeping its forerunner as International Electro Technical Commission (IEC), which was created in 1906. International Federation of the National Standardizing Associations (NSA) was created in 1926 which undertook its pioneering work primarily in mechanical engineering. But their work was interrupted due to Second World War. In 1946 a subsequent meeting was held by twenty-five countries and created a new international organization with an objective of ‘the facilitation of the international co-ordination and unification of industrial standards’. As a result, ISO was duly formed and began its official functions on 23rd February 1947.

ISO is a non-governmental organization which sees its mission as the promotion tool for the development of standardization and related activities in the world. It facilitates the international exchange of goods and services, and develops co-operation in the spheres of intellectual, scientific, technological or human-technological and economic activity.
3.1.2 Members of ISO

ISO is made up of three categories of members. The first one, **Member body** of ISO, is the national body which is most representative of Standardization in its country having full voting rights and is known as **P-members**.

The second one, **Correspondent Member**, is usually an organization in a country, which does not yet have a fully developed national standards activity. The members do not participate in policy or development work but are entitled to be kept fully informed concerning relevant interesting issues. They are known as **O-members**.

The last one, **Subscriber Membership**, is for countries with very small economies and as a result they pay reduced membership fees. This membership enables them to maintain contact with international standardization work. The work of ISO is carried out by a hierarchy of Technical Committees (TCs), Subcommittees (SCs) and Working Groups (WGs). These constitute about 2,800 groups.

Within these committees there are qualified industry representatives, research institutes, consumer bodies, government authorities and world-wide international organizations whose objective is the resolution of global standardization issues. These are all of equal status within a group and it is estimated that about 30,000 experts participate in meetings each year.

The administrative responsibility for a standards committee is accepted by one of the national standards bodies. The Central Secretariat of ISO located in Geneva, coordinates the dissemination of documentation facilities clarification with chairmen and
the agreement of technical content by committees; coordinates for meetings and generally provides overall support.

All International Standards are reviewed at least once every five years by the responsible TCs/SCs. A majority of P-members of the TCs/SCs decide where an International Standard should be confirmed, revised or withdrawn.

3.1.3 Quality Movement in India

Quality has been found to be a tradition in India. Monuments, relics, handicrafts, gems, jewelers and craftsmanship have woven quality into Indian heritage. Meanwhile quality found its own way of managing business in US and Japan in the 1950s, but it was not so in India. Quality movement in India was consolidated in 1980s to bring about a synergy of resources by the pioneering efforts of Confederation of Indian Industries (CII).

The early founders and thinkers of quality movement have embarked upon the need for quality in Indian industry through their visits. Walter Shewart, the father of Statistical Quality Control (SQC), visited India for a short period of three months during 1947-48. He initiated the SQC movement through visits to factories, personal discussions and lectures. DR Edward Deming who taught the Japanese, the means of applying the Plan-Do-Check-Act (PDCA) cycle now known as Deming Cycle, came to India in the early 1950s. While, the Japanese attributed their success to the learning from two American Gurus, Dr. Deming and Dr. Juran, the rest of the world was lagging behind until the 1970s when the effect began to hurt businesses. The formal launch of TQM movement in the US in early 1980s triggered a movement for quality in India and
in 1982 the quality control circle was born among some of the companies launching quality control circles in public sector undertakings. The first launch was found in Bharat Electronics and Bharat Heavy Electricals. A movement also began in Nasik with the umbrella of CII by a small group of companies which began to practice some of the quality circle techniques and showed some result. Later, CII provided a focus and an impetus to the quality movement by forming the TQM division in 1987. By then, the focus had shifted from Quality Circles to Quality Management. The movement in Quality Circles was consolidated by the Quality Circle Forum in India (QCFI).

In 1986 Prof. Ishikawa, founder of Quality Movement in Japan was invited by CII to address quality movement in Indian Industry. Some companies showed interest to begin “Quality Movement Teams” for setting the path of Continuous Improvement. CII organized its 1st major seminar with Juran in 1987. In the mid 80s the process of socio-economic reforms started on and set forth a trend for competition and liberalization. In the year 1987 ISO 9000 Standards were brought into reality and visible strategies emerged from the European market to set a global trend towards standardizing and certifying Quality Systems. Since, the European Market was a big market for Indian industries; CII organized training courses for ISO 9000 in 1989. Two years later the first company in India got certified to ISO 9000 in 1991. From then onwards, the movements gathered momentum and today more than 500 companies have secured ISO 9000 Certification.

3.1.4 India and ISO: 9000

The Indian economy is progressively developing towards a free market-oriented economy. Industries in India have recognized importance of aspects like productivity,
efficiency, effectiveness, quality and competitiveness for long term survival and entry into the global market. India has launched a vigorous programme for implementation of ISO: 9000 both in Industrial and service sectors. As a first step, it adopted ISO: 9000 series in 1988 (initially as IS: 14000 series). All agencies concerned with quality such as national standard body, industry associations, government agencies, training institute, quality promotion agencies and consultancy organizations started a nationwide movement to prepare the industry in the application of ISO: 9000. These promotional efforts included quality system orientation programme, quality surveys consultancies services by industry associations, etc.

During the last 5 years considerable progress has been made. Over 550 organizations in the field of engineering, chemical, paper, textile, food processing, industries, testing laboratories, service organizations and financial institution have already obtained ISO: 9000 Certification. The Import and Exports Policy 1992-97 announced by the Government of India focuses on building international competitiveness in quality goods and services. The government initiates to support and promote the quality programmes and encourage manufacturers and exports to attain internationally accepted standards of quality in their products. These include (i) Quality Awareness Campaign (ii) Rewards and Benefits (iii) Incentive for Small Scale Industries (iv) Upgradation of testing facilities.

Conceptual thinkers like D.D Sharma (2001) consider quality as an evolutionary concept. He has given evolutionary changes in quality starting from quality of work life (1975), to quality circles to productivity and employees’ involvement (1985), to

**Figure No: 3.1**

**Evolution of Quality**

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After 2000, ISO has taken a growing concept of quality improvement in all possible dimensions of business enterprises.

**3.1.5 Introduction to ISO 14001**

All kinds of organizations are concerned to achieve and demonstrate healthy environmental performance by controlling the impact of their activities, production or service, on the environment. In the context of increasingly stringent legislation, the development of economic policies and other measures brings environmental protection for the effective assessment of environmental performance. Organizations need to conduct environmental ‘reviews’ and ‘audits’ within a structured management system and integrated with overall management activities.
This International Standard covers the element of an effective environmental management system to integrate and assist other management requirements to achieve environmental and economic goals. But, these International Standards do not establish absolute requirements for environmental performance beyond commitment in the policy to compliance with applicable legislation and regulations and for continual improvement. These International Standards share common management system principles with the ISO 9000 series of quality system. It should be understood that the application of various elements is up to the interested parties to use an existing management system consistent with the ISO 9000 series as a basis for its environmental management system. Quality management system deals with the customer needs whereas environmental management systems address the needs, on a broad range, of interested parties and evolving environmental protection.

The overall aim of the International Standard is to support environmental protection and prevent pollution in balance with socio-economic needs. It should be noted that many of the requirements may be addressed concurrently or revisited at any time.

3.1.6 Background of ISO 14001

In England, the British Standards Institution (BSI) developed BS 7750, the EMS (Environmental Management System), as companion to its BS 5750 standard on QMS (Quality Management System). BS 5750 was the forerunner and template for ISO 9000. In 1991, the Strategic Advisory Group on the Environment (SAGE) was established by the International Organization for Standardization (ISO) to make recommendations regarding international standards for the environment. The group
spent nearly two years on studying BS 7750 and other national EMS standards in order to determine the need for ISO International Standardization. This resulted in the formation of technical committee (TC) 207 and in the development of ISO 14001.

The discussions between ISO and the British Council resolved to work for Sustainable Development and about the need for standardization in the field of environmental management, which led to the setting up of an ISO-Technical Committee (TC-207). The committee first met in July 1993 and an initial work programme covering 25 items was established. It was agreed to set up subcommittees to deal with the following Structure.

Figure No:3.2
Structure of ISO 14000

![Structure of ISO 14000 Diagram]
The structure of ISO 14001 has five core elements that need to be addressed by a company wishing to implement an environmental management system. The core elements are arranged in such a manner that three of the elements are fitted into the planning, implementation and measuring and monitoring (checking and corrective action), and finally action to improve. The company begins with the policy that supports to achieve environmental objectives in a structured way. The company starts with the identification of the environmental aspects from its normal operations, abnormal operations, and emergency situation as well as considers those it can directly control and those which the company can influence. It then evaluates the aspects which have a significant impact on environment and priorities their improvements. The company can minimize the significant impact in a time frame which is reflected in its environmental policy.

Researchers have specifically sought a validation that the implementation of EMS programs in organizations will result in increased performance. Since 1990, there have been efforts at the national level, within the European Union, and at the international level to standardize EMS by defining the essential elements in quality system, for example, EMS standards, such as the British Standard BS 7750. ISO 14001 provides the basic framework for the establishment of an EMS, which can be certified and audited. The main purpose of formation of ISO 14001 were to provide an internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance, thereby expedite international trade by harmonizing otherwise diffuse EMS (ISO14001). However, it is not clear how successful the
internationalization of standardized management systems will be, as the diffusion of ISO 14001 varies significantly across the globe.

3.1.7 Quality and Environmental Management Systems

Recognizing the importance of quality and environmental management system, both researchers and practitioners have increasingly focused their attention on the effective management of quality in their organization. A reduction in environmental emissions led to improved financial performance after one or two years. There was a significant linkage between environmental and quality programmers and performance. Those companies that pollute the least have the highest quality products and services. In addition, they found that environmental leaders focus on reaching a goal of zero emissions, which is best achieved by continual, relentless cost reduction and quality improvement. The majority of environmental impacts are relatively small and shows sign for continual improvement techniques.

Environmental performance is a relevant business issue across the world, not just in the developed economies. Announcements of government responses to environmental problems in developing countries caused far larger stock market penalties than the announcement of the problem itself. The divers of ISO 14000 certification and environmental improvement in China found that they were often different. High exports to Japan positively affected ISO 14000 certification but had no effects on environmental performance, and exports to Europe.

The investment in adaptive environmental technologies could actually hurt long-term quality performance. Leading firms now move beyond mere regulatory
compliance to focus on continuous environmental improvement. The adoptions of the international Environmental Management Standard ISO 14001 play an important and positive role in assisting firms to gain a competitive advantage. There is a strong and positive impact of external stakeholder involvement in customers, shareholders, community members', distributors, and regulatory agencies for competitive advantage but the impact of employees is less strong.

3.1.8 Transition of ISO

Quality transformation is a process that enhances the forms and patterns of quality activities. It affects the adoption of quality management practices in individual firms and governs the development trends of quality management in a region or nation. Adoption of effective quality management strategies will be one of the most crucial factors for success in manufacturing industries. Before the 1990s, the empirical studies of Quality Management practices were found to be unsatisfactory. Quality standards influence productivity significantly. The impact of quantity standards is dampened considerably by the introduction of precise quality standards. The influence of quality spread through overtime and group incentives are more influential on productivity by increasing importance of quality standards.

Firms were more likely to try quality circles when performing poorly firms. The quality assurance and reliability functions are not adequately represented at board director level. The techniques of quality and reliability are still not being adequately used.
3.1.9 Toward The Quality Management Paradigm

Many of the Indian companies accredited to ISO have undergone implementation process for introducing new quality system elements within their organizations. All these organizations employ a quality system to some extent in order to achieve accreditation to ISO 9000. This system may generally need structured framework for implementing requirements of the standards. The detailed ISO quality system activities are:

**Analysis:** It involves an identification of quality objectives, a review of the existing quality systems, ensuring of commitment of senior management and development of the ISO 9000 implementation plan.

**Product or Service Specification:** The second step involves developing contract review procedures, design and development procedures, the procedures for controlling the issue, approval and change of the quality system documents and production of quality plans.

**Material Control:** The third step involves procedures for the specification of bought-in goods or services, methods for assessing sub-contractors and procedures for reviewing raw materials including sampling plans and control procedures for any materials supplied directly by the customer.

**Process Control:** The fourth step requires procedures for identifying the product through conversion process and for maintaining traceability, to describe the control of all main production or business processes and associated detailed work
instructions. Standards of workmanship need to be defined together with criteria for acceptability of the product at the appropriate process stage.

**Inspection and Testing:** This step includes the methods for in-process and final checking of the product contract including the definition of acceptance criteria. Details are required on inspection status of product maintained; procedures for calibration of equipment and the associated records adhered thereto.

**Quality Records:** This requires procedures for the maintenance and storage of quality system records. It also requires procedures for periodic audition of the system. Employees training procedure records are also audited.

**Quality Manual:** A quality manual should be prepared which is a relatively brief document stating the business policy with respect to quality. It should be structured in line with sections of ISO 9000. Detailed procedures should be seen as a means of promoting the company approach to quality.

**Quality System Design and Structure:** The companies in India have undertaken only one of the formalized designs of the quality systems process. The process often benefits from the advice of the external consultants under the Bureau of Indian Standards (BIS), Nation Productivity Council (NPC) and some private consultants.

**Documentation of Quality Systems:** It is essential that ISO 9000 quality system should be documented, established and maintained. This documentation includes quality manual, quality procedures, work instructions and
forms/records/specification/files etc. Based on the organizational structure corporate manual, divisional manual and departmental manual are introduced under the layer of hierarchical band. To be effective manual, bridges in the form of references, from each layer to the one below, are introduced with properly interlinked suitable cross references. For this purpose, a suitable numbering system may be evolved for the entire documentation system.

Generally, quality manual describes the business. The organization is in functioning and explaining the manner in which the organization intends to comply with the requirements of the standard. Manual is in the form of explanation by direction, by listing responsibilities and authorities and by documenting the activities undertaken to ensure a consistent approach in the achievement of objectives. It includes quality, policy objectives, and explanation of organization chart indicating hierarchical positions and linking quality assurance function with higher management needs on the basis of applicant element model of ISO series.

Quality procedure reflects the requirements of the standards or the operations of the business. It is a specified way to perform an activity of how the policies and objectives expressed are being achieved from the operations of receiving an enquiry to delivering a completed product or service. Work instructions show the details of how individual work processes are carried out within a company, how the work should be done; who should undertake the work; what records are to be maintained, are stated clearly, concisely and auditable.
Quality forms and records provide the objective evidence of activities performed or results achieved. There are three main groups of documenting involved in this category (i) forms of different kinds that are used for purchasing, audit reports, calibration, recording, etc. (ii) records of activities that are required by the standards together with relevant sub-contractor's records such as certificates of conformity, and (iii) material used as inputs to the product or service such as standards codes of practice and regulations. Document approval is required for all the documents by the suitable personnel appointed within the organization. ISO standard requires that a control should be exercised to ensure that only pertinent documents are maintained at correct revision status wherever and whenever they are required by removing all obsolete documentation. Changes to documents should be controlled and unauthorized changes be prevented.

Quality system auditing is one of the key element tools for achieving the objectives set out in the quality policy. Internal auditing is carried out by a company on its own quality systems, external auditing is carried out by a company to evaluate suppliers' quality systems and third party audits are carried out on the company by third party organization (Certifying bodies). Audit schedules are matrix of the timings as to when each audit element is to be checked throughout the year. Audit reporting primarily involves the recording of any non-conformity and summarizes the audit findings for the purpose of management review.

Management review reports provide details of the relative performance of various elements of quality system. They summarize the non-compliances both in
terms of quality system elements and in terms of the department function responsible for the discrepancy.

Learning in environmental management programs is unrelated to the existence of a TQM program\textsuperscript{17}. Moreover, some managers perceived that the demands of consumers and the public were different, prompting separate programs to better address the needs of each \textsuperscript{18}. Investment in adaptive environmental technologies can actually hurt long-term quality performance \textsuperscript{19}. These, two patterns of thought have begun to emerge. The first proposes that the definition of quality should be broadened to include environmental impact, and that quality tools should be applied as needed to environmental issues based on public, regular, and customer demands. In contrast, the second argues that environmental concerns must be managed in a separate and distinct manner.

3.1.10 Quality Movement in Study Area

Quality in seventies was established as just the responsibility of the quality-control department. The emphasis was on quality tools and techniques such as control charts and lot inspection / checks. The top management was hardly even directly involved in quality-related matters. The eighties saw a revolution (a) in the attitude to quality, (b) in the role and (c) responsibility of the quality-control manager. Top management executives began to realize that quality was something they had to commit themselves to personally. The quality manager was thus given increased responsibility in advising the company on these matters, in training and introducing quality ideas to departments other than manufacturing while quality-control programmes in the eighties.

64
were geared towards manufacturing; the nineties saw an emphasis on quality in all other aspects, be it marketing, finance or personnel.  

Making quality everybody’s responsibility, high level of visibility on quality control and long-term commitment to quality control efforts become as essential one. Once the use of quality techniques became a part of manufacturing routine, continuous quality improvement and waste elimination became everyone’s objective.

The implementation of ISO is a serious matter, which can add tremendous value to any organization. Obtaining the ISO 9001:2000 certification is a small investment compared to the losses or drawbacks of not achieving certification.

The application of ISO standards helps in ensuring operational excellence. Top- Management ought to create a common viewpoint which guides the behaviour of each individual. So top management would organize itself in such a way that the technical, administrative and human factors have to integrate with ISO 9000 elements and principles of company’s present practices thereto.

The present study was carried out in M/s Seshasayee Paper and Boards Limited, Erode, Tamil Nadu, India. The company was incorporated in 1960; commencement of its production was in the year 1962. The first expansion was held at the year 1969 and its second expansion was held in the year 1978. Third expansion was held at the year 2000 with a rated capacity to produce 115000 tons of pulp and paper per annum.

Linking above theories to the study area of Seshasayee Paper and Boards Limited circumstances, it can be remarked that the hierarchy level of management
theory could be relevant. It is predictable that the impact of ISO inspires and initially started from TOP Management from the year 1995 itself. The Chairman and Managing Director of SPB framed a Quality Policy of ISO in January 1996.

SPB was awarded its first “Quality System Certification” under ISO 9001: 1994 by Det Norske Veritas (DNV), Netherlands on 25th October 1996 and Re-certified on 25th October, 1999. The second certification of “Environmental Management System” under ISO 14001: 1996 was awarded by the same DNV on 3.08.2000 and Recertified on 7.10.2003. Totally there are two policies framed for ISO, the first one is Quality Policy and the second one is Environmental Policy.

3.1.11 Quality Management System in SPB

SPB’s existing new Quality Policy under ISO 9000:2000 was framed on 15.4.2002 by its Chairman and Managing Director:

1. To be a trusted supplier of quality paper.

2. To delight their esteemed customers with continual improvements in the quality of their products and services.

3. To be environmentally responsible organisation and resources in pursuit of the above goals.

4. To constantly upgrade their processes and human resources in pursuit of the above goal.
The problems linked with the role and the effects of certification on a firm’s competitiveness are important points as considered by many scholars, managers, and consultants; and a number of conflicting points of view have emerged within the quality standards in action. 

Some authors have presented extremely negative reports concerning 1987 and 1994 editions of ISO 9000. The adoption of ISO 9000 entails bureaucratizing the firm’s operations because of an excessive recourse to documentation. Innovation and continuous improvement are not encouraged; in reality, applying the norms promotes stagnation.

Paradoxically, the quality in the outward appearance is not encouraged or enhanced. A certified company could find itself with a high percentage of production defects. If non-conforming products are segregated and handled in accordance with documented corrective action procedures, the firm is nonetheless able to obtain certification. This involves the operating procedure to look further more

3.1.12 The Policy Deployment Procedure

The operating procedure of ISO in SPB comprises a hierarchy level. The top management, Director Operations and Vice President Technical frame the ISO policy. Deputy Manager Representatives work towards deployment of policy with duly dated priorities and schedule of work. They prepare requisition for educational and training inputs for the whole organization to contribute to the entire organizational performance achievements as per the policies. The guidelines given in the manual are applied by the
steering committee to all the areas. The concerned heads (heads from all the departments) are responsible for organizing vigorously pursuing improvements.

**Figure No: 3.3**

**Policy Deployment in SPB**

The top management of SPB regarding ISO works as to fulfil the requirements for developing and improving quality system by following the quality policy (a) Trusted supplier of quality papers (b) Continual improvement in the quality products (c) Continual Improvement in the quality of services (d) Environmentally responsible organisation (e) Up-gradation of processes (f) Up-gradation of human resources. In conserving ISO in SPB, each and every department strives to achieve the same. In order to achieve designed-in-quality, people must agree on the service concept and share the same values. One important step in achieving this is the creation of a mental model that is common throughout the whole organization. It must be shared by every body in the project team who has a key role in a service culture.
If one wants to avoid the risk, process documentation may be introduced in a ritual spirit. By using quality assurance specialists or consultants, make the process “visible” and should be severely limited. ‘Documentation’ is a good way of capturing the manner in which processes actually work and therefore, it supports daily work. It brings improvement only if result in an active effort to rationalize one’s own ‘expertise’ or, in other words, if it contributes to an actual growth in formalized and accessible organizational knowledge.

Former research made an in-depth understanding of ISO process concept with Wood Co, Laser Co, Baath Co certification experiences. In all the three organizations, they found that the development of process architecture appeared to be a sheer ‘ritual for conformity’ and there was no reflection on the managerial ends that underline the way in which a company would construct its process architecture.

In case of SPB, the researcher found that top management of ISO in SPB framed the formalization of ISO processes in a range of documents that describes the functioning of each department. These operating procedures and decision making criteria are formally called “Operating Visibility” which reflects the manner in which process of ISO in SPB Ltd actually works. This operating visibility is not found as a ‘crux target to pass the ISO 9001 and 14001 examination, only it is result of a rationalization and knowledge codification process actively involved in its work flow’-ISO SPB. DMR assists and activates all the functions laid down by DO and VPT and the steering committee follows it.
The calibration of equipment and tools in the factory is inspected by Chief Inspector of Factories appointed by Tamilnadu Government. SPB calibers its lab and Research and Development equipments every six months by Elofannson which is functioning all over the world.

Davenport 1993 says that each individual process is a complex set of activities that produces a range of outputs e.g. human resources management, which includes recruitment, selection, training and evaluation of personnel and the establishment of incentives schemes; in this case a conceptual category is assigned to the aggregation of more basic activities formulated with the criterion of the overall function the perform.

In SPB, ISO group directly concentrates on training programs with the help of the personnel department. House keeping and Safety Programmes are considered as its prime objectives. For initializing training, each department has to report about their department functional workers in order to evaluate their betterment and other than these, their appropriate education and experience are assessed and suitable training programmes are framed. For training programmes, both internal and external faculties are arranged through personnel department. “Training is also a big issue; every employee knows what to do and every one had certain piece of training”.

Management Review Meeting is held once in three months for ISO User departments and once in every six months for Non user departments. Management Review document consists of description of activity, present status, action plan taken, responsible authority, and review action taken in the last MR meeting.
All nonconforming products are subjected to a formal risk assessment for potential performance degradation by disposition review board, material review board or quality action notice. The ultimate purpose of these review boards is to protect customers from the impact of nonconforming products.

In case of Nonconformities, SPB Lab plays a vital role in ISO. SPB Lab acts as police to check the confirmation of production process through on-line checking towards the established objectives. This operation is called “CAPA” (Corrective Action and Preventive Action) System.

Each manufacturing site has a Quality Systems Manager who is responsible for developing and implementing quality audits at the site. These individuals coordinate all activities related to internal site audits, including planning the audits, creating and managing audit teams and ensuring that the audits are performed as per published schedules.

Towards internal auditing, internal auditors are fixed by DNV as engineers from each department and they are given a special training for the purpose of internal auditing. Internal auditing of ISO is done three times each year and the results are communicated to each department. External auditing is done by DNV twice a year and their assessments are also communicated to CMD.

3.1.13 Environmental Management System in SPB

Environmental Policy of SPB is as follows:

1. To manufacture quality papers in a clean, green, and safe environment.
2. To continuously improve their environmental performance by reducing air emissions, process effluents and solid wastes.

3. To maximize the use of eco-friendly materials and methods in the manufacturing processes.

4. To optimize usage of resources like water, power, fuel and raw materials

5. To comply with relevant regulations.

6. To train and motivate their human resources to be environmentally responsible and

7. To make this policy known to all interested parties.

Top management defines the organization's environmental policy to ensure that it is appropriate to the nature, scale and environmental impacts of its activities, products or services which include (i) a commitment to continual improvement and prevention of pollution (ii) a commitment to comply with relevant environmental legislation and regulations, and (iii) with other requirements to which the SPB wants to subscribes to. In addition to these, top management provides a frame work for setting and reviewing environmental objectives and targets which are also documented, implemented, maintained and communicated to all the employees.

SPB maintains documented environmental objectives and targets at each relevant function within the organization. When establishing and reviewing its objectives SPB considers the legal and other requirements, its significant environmental aspects, its technological options, its financial, operational and business requirements and also the views of interested parties.
Towards planning environmental aspects, SPB’s ISO group establishes and maintains procedures to identify the environmental aspects of its activities, products or services through which it can control and over which it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment. Top management makes sure that the aspects related to these significant impacts are considered in setting its environmental objectives.

Concerning legal and other requirements, top management of ISO in SPB establishes as well as maintains a procedure to identify the legal and other requirements to which SPB can subscribe, that are applicable to the environmental aspects of its activities, products or services.

In case of Environmental performance noise level, process effluent, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Absorbable Organic Halogens (AOX) tests, Corporate Responsibility Environment Protection (CREP) are made in SPB. Operational control procedures are prepared for (i) Air management (ii) Waste water management (iii) Solid waste management and (iv) Suppliers and contractors.

For measuring Air emissions, Ambient Air Quality Analysis is held by SPB Lab every day and Ambient Air Quality Analysis is inspected by Tamil Nadu Pollution Control Board (TNPCB) on frequent visits. Stack emission by boiler is analyzed by SPB Lab every day and Stack emission by boiler is analyzed by Tamil Nadu Pollution Control Board (TNPCB) on their frequent visits. Any suggestions by chief inspector of
factories will be maintained through register for further improvements. Further, the CMD (Chief Managing Director) of SPB makes self-analysis for customer satisfaction on the basis of 10 point scale in which they got 5th rank when compared with market situation.

Regarding implementation and operations structure and responsibility in SPB towards environmental management system, top management provides resources essential to the implementation and control of the environmental management system. These resources include human resources and specialized skills, technology and financial resources. More than this, top management appoints specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for ensuring EMS requirements to be established, implemented and maintained, and for reporting on the performance of the environmental management system to them for review and as a basis for improvements of the environmental system.

In respect of training, ISO group of SPB identifies its training needs by identifying the personnel at each functional level whose work may create a significant impact upon the environment. It also maintains operational procedure to make its employees at each functional level aware of environmental policy to bring significant impacts on their task and responsibilities. In achieving conformance with the environmental policy SPB includes emergency preparedness and response requirements and potential consequences of departure from specified operating procedures.
For the purpose of document control and operation control, the documents related to the International Standard ISO: 14001:1996 are controlled for easy location, periodical review during audits and meetings, making approved changes, and to withdraw obsolete documents. Creation and modification in document control and operation control are mentioned in the procedure manual which is distributed to each department.

Non-Conformance of EMS is related to environmental performance, regulatory compliance, EMP progress (Emergency Preparedness) and emergency occurrences. SPB has established and maintains procedure for taking action to mitigate any impacts on the environment which are also encountered for initiating and completing corrective and preventive actions.

For auditing, procedure has been established for the identification, maintenance, and disposition of environmental records. Periodical Environmental Management System is carried out with both internal and external audits. In order to ensure continuing suitability, adequacy and effectiveness, top management conducts management review at regular intervals and this review is also documented and communicated to all the departmental heads.
SECTION 2

PAPER MAKING

3.2. HISTORICAL DEVELOPMENT

Paper making can be traced to about AD 105, when T´Sai Lun, an official in the Imperial Court of China created a Sheet of paper using mulberry and other bast fibres along with fishnets, old rags and hemp waste. In its slow travel westward, the art of papermaking reached Samrkand, in Central Asia, in 751 and in 793 the first paper was made in Baghdad during the time of Harunat-Rashid, with the golden age of Islamic culture that brought papermaking to the frontiers of Europe. In the 10th century Arabians substituted linen fibres and bamboo to create finer sheet of paper. By 12th century paper making reached Europe. Johannes Gutenberg invented printing machine at 1448 which led to rapid increase in demand of paper. The first successful paper machine was built by JLN Robert in 1798. Thereafter, papermaking underwent revolutionary changers, when several major pulping processes were gradually developed which relieved paper industry of its crucial dependence upon cotton and linen rags. The change in paper making is observed and segregated in stages. The five stages of paper in 19th and 20th century is given below.

Five stages:

Stage I (1800-1860)

- Mechanization – rage preparation, use of filler, pulp beating and paper machine
Stage II (1840-1880)

- Industrial scale rage substitute (ground wood/chemical pulp) and appropriate pulp mills were developed

Stage III (1860-1950)

- Enlargement of web width - 85 to 770cm
- Increase in production speed - 5 mpm to 500 mpm
- Introduction of electric drive
- Machines to produce particular type of paper

Stage IV (1950-1980)

- Further increase in web width and working speed, use of new materials (TMP, dinked paper, new filler, chemicals and dyes), new sheet forming (twin wire formers) etc.

Stage V (1980 onwards)

- Leads into future
- Evolution of new sheet forming principles and chemical pulp processes

Although modern inventions and engineering have transformed an ancient craft into a highly technical industry, the basic operations in papermaking remain the same to this day. The steps in the process are as follows (1) suspension of cellulose fibre is prepared by beating it in water, so that the fibres are thoroughly separated and saturated with water; (2) the paper stock is filtered on a woven screen to form a matted sheet of fibre; (3) the wet sheet is pressed and compacted to squeeze out a large proportion of
water: (4) the remaining water is removed by evaporation; and (5) depending upon use and requirements, the dry paper sheet is further compressed, coated or impregnated. The differences among various grades and types of paper are determined by the type of fibre or pulp, the degree of beating, the addition of various materials to stock, formation conditions of the sheet, including basis weight, or substance per unit are, and the physical or chemical treatment applied to the paper after its formation.

3.2.1 Global Paper Industry Scenario

Global production of paper and paper board is around 350 million tons which contributes to about 3.5% of World’s Industrial production and 2% of world’s trade. India is ranked 15th in the World in terms of Paper and Boards production capacity. The top pulp and paper board producers in the world are shown in the following Figure 3.4.34.

Figure No: 3.4

Top Pulp and Paper Board Producers in the World

Source: ICRA
The world paper industry is growing at a CAGR (Compound Annual Growth Rate) of 2.8% with a per capita consumption of 45kg. The per capita consumption is 152 KG in developed countries and 12kg in developing countries and in India it is around 6 kg. The World consumption of Paper and Paperboard is shown in the Figure No 3.5.

Figure No: 3.5

World consumption of Paper and Paperboard

3.2.2 Indian Paper Industry Scenario

India is the land area covered by 3.3 million Sq. Km in which area covered by agriculture is 47% forest by less than 20% and having the population of 1.04 billion. Its population growth per annum is 1.96% and population density is 324 persons /Sq. km. India is the 10th largest industrialized sector in the world and it accounts for Asia’s 4th largest economy. The GDP growth rate is around 7%, one of the highest in the world and the GNP per capita is Rs 21,9576 or GNP 22,834 billion rupees. The economy size
contributed to US $ 600 billion, growing at 6% for the last five years. The value of exports (2003-04) is Rs 28,3605 crore values of Imports (2003-04) is Rs 34,6475.  

per capita consumption of paper in Asian countries is shown in Figure No. 3.6. 

Figure No: 3.6

Per Capita Consumption of Paper in Asian Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Production (Million)</th>
<th>Consumption (million tons)</th>
<th>Consumption per capita (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>31.828</td>
<td>31.736</td>
<td>250</td>
</tr>
<tr>
<td>China</td>
<td>30.900</td>
<td>36.277</td>
<td>28</td>
</tr>
<tr>
<td>Korea</td>
<td>9.308</td>
<td>7.385</td>
<td>156</td>
</tr>
<tr>
<td>Indonesia</td>
<td>6.935</td>
<td>3.911</td>
<td>19</td>
</tr>
<tr>
<td>Taiwan</td>
<td>4.500</td>
<td>5.110</td>
<td>229</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td><strong>5.260</strong></td>
<td><strong>5.220</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td>Thailand</td>
<td>2.466</td>
<td>2.114</td>
<td>34</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1.078</td>
<td>2.251</td>
<td>101</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.750</td>
<td>0.828</td>
<td>11</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.389</td>
<td>0.570</td>
<td>7</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0.190</td>
<td>1.041</td>
<td>151</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.052</td>
<td>0.577</td>
<td>160</td>
</tr>
</tbody>
</table>

Source: Metso paper

The paper industry is estimated to contribute about 2,000 to 2,500 crores to national exchequer by way of Excise Duty and Sales Tax. Indian paper industry reported a volume growth of about 6% in 2003 - 04 in line with GDP growth. Indian domestic per capita consumption of paper is 6Kg. The paper market in India is in a 'catch up' phase with growth rate more than twice the world's average. The demand of paper in India is shown in the Figure No 3.7.
India is the second most populous market for paper in the world and it is ranked 15th in the world in terms of paper and board production capacity. The country has 16.5 % of the world’s population but accounts for only 1.53% of the world’s total consumption of paper. India has a large pool of well educated and trained manpower but its labour cost is low. The Indian personnel costs are shown in the following Figure No. 3.8.
Paper industry is the second largest sector providing employment to 0.3 million people directly and about 1 million people indirectly. Industry turnover is 120 billion rup and contributes about 2.3% of overall Indian industry’s output. Generally, composition of Indian paper industry is wood based (35-40%) and non wood based (65%). The wood based industries are functioning under imported/indigenous hardwood/softwood, bamboo and the non wood based industries are classified as residue based (functions under bagasse and sabai grass, Jute/rag, wheat straw) waste paper based (imported/indigenous waste paper, corrugated/kraft waste paper, waste cuttings). The end products of paper industry are classified under (i) Cult paper: this accounts for 44% of total domestic demand. It consists of writing...
printing paper, office stationery, communication paper and specialty paper such as cheques and currency papers. The demand is a function of the GDP, the population, the literacy levels, and the standard of living. (ii) Industrial paper: this accounts for 43% the total demand in India. It consists of kraft paper, pulp board and duplex board, and is used in packaging applications. Demand depends on growth in industrial production, consumer durables, processed food, and other kind of packaging. This segment is relatively price inelastic. (iii) Newsprint: this accounts for 80% of the output; it depends on the number of newspapers, the size of the paper and the circulation. It has been placed under the OGL which means that newspaper companies are free to import any quantity of newsprint.

Large size mills (above 50,000 tpa) are reasonably modern and efficient but design capacities of world paper machines are about 20-30 times the capacity of the best Indian paper machines. Smaller size machines result in higher energy consumption besides quality constraints. Quality benchmarking with international standards improved technology are being used for cleaner, brighter and stronger paper. High speed machines of more than 1000 mpm are not many in India. The major paper producers in India are given in the following Figure No:3.9.
Figure No: 3.9

Major Paper Producers in India 2002

Source: Jaakko Poyry

Paper Industry represents an important segment of the Indian economy. The Industry has witnessed a steady increase in installed capacity and production over the decades. The paper industry in India is primarily tree-free as 62 per cent of the market is catered by paper products from non-conventional raw material like agro-waste, agro-residues and recycled papers. The demand is estimated to be around 54.80 lakh tonnes in 2005-2006 on the basis of growth rate of 6.5 per cent for the period 2000-01 to 2005-2006. The paper industry which grew at the rate of 7.9 per cent in the year 1995-1996 witnessed a slump in the year 1996-97 during which the growth rate of paper industry came down to 3.1 percent. The Government has completely de-licensed the paper industry from 17 July 1997. The paper industry reported an average growth rate of 5 percent each during 1997-98 and 1998-99.
At present, there are about 380 mills in the country with an annual installed capacity of about 45.5 lakh tonnes. They account for more than 5 per cent of the total installed capacity and production. At present, the capacity utilization in the paper industry is about 67 percent, as 125 paper mills particularly small mills are sick and or lying closed. Several fiscal incentives have also been provided to the paper industry, particularly to those mills which are based on non-conventional raw material. Import was 1.82 lakhs tonnes in 1966-97 and 3.05lakhs tonnes in 1997-1998. It is estimated to be almost 2.20 lakh tonnes in 1998-99. About 70,000 tonnes of paper is exported per annum mainly to the neighboring countries.

Paper is a natural product, manufactured from a natural and renewable raw material, wood. Pulp - the basic ingredient for the manufacture of paper and board - is produced from fresh wood, woodchips from sawmills recovered paper and sometimes even from textiles agricultural by products or industrial crops. The pulp, paper and board are a necessity for almost all forms of activity, such as in communications and advertising (newspapers, magazines, directories), education (books, writing paper, etc.), business (security papers, forms, labels, copy paper), commerce (bank notes, cheques, postage stamps), culture (photography, art-work), hygiene (kitchen rolls, napkins, diapers), medicine (dressings, swabs), food and beverage packaging (coffee filters, paper crockery and cutlery, liquid carton board, folding box-board), transport and protection (tachographs, bags, sacks, paperboard packaging)\textsuperscript{40}. 
The last decade of the twentieth century will almost certainly be characterized as one of accelerating globalization. Although individual countries and regions of the globe experience change and react to it in ways that are unique, it is clear that they are becoming increasingly interdependent. Corporations are becoming more and more multinational through expansion, mergers, and acquisitions. Trade barriers are falling away. Public policy issues, notably those concerning environment, are having worldwide impact, democratization is changing social and political patterns in the direction of increased co-operation and accord. The pulp and paper industry worldwide is dearly a participant and is profoundly affected by these changes. An international perspective is essential today, both in developing longer term strategy and in making shorter term business decisions.

Studies in relation with growth rate shows the US pulp and paper industry (SIC 26) is one of the more energy intensive manufacturing industries. It accounts for 12 percent of total manufacturing energy use, 95 percent of which is consumed by pulp, paper and paperboard mills. US demand for paper products increased over the last two decades to the highest per capita rates in the world. Today, the US pulp and paper industry accounts for approximately 30 percent of total world production capacity. Given continued growth in demand for its products, further capacity increases are likely. This means that production of the US paper industry will continue to expand.

From 1999-2003, Russia's pulp and paper industry focused on satisfying the demand for materials for the rapidly growing domestic packaging industry. In 2003
Russia produced 6.3 million tonnes of paper and cardboard products, from which 41% (2.5 million tons) were exported.

Studies in relation with growth rate shows Thai pulp and paper industry fell from 15.3% in 1994, to 10% in 1995, mainly as a result of sharp increase in world pulp and paper prices.

The Indian paper industry presents a unique picture, with a mix of large and small paper mills, having capacities that range from five to 600 tonnes/day, with an average size of 11,500 tonnes/year. There are more than 600 pulp and paper mills produce nearly 6.2 million tones/year of paper and board as against its installed capacity of 8.6 million tones. The industry has a turnover of more than $35 million employing nearly 300,000 people directly; and another one million indirectly.

India possesses the advantages of a large labour force with a skilled engineering and scientific community; however, the labor market remains probably the most ineffective in the work because of deficiencies in the infrastructure sector and redundant labor laws, which limit their productive capabilities. The prominent issue that has been neglected by analysts is the abysmal ‘quality’ of Indian products, which are generally not acceptable in international markets. The Indian paper industry is more than 100 years old. Barring a few exceptions of new modernized mills most of the mills are based on obsolete process technologies. Small scale of operations and use of diverse raw materials pose significant threats to the long term sustainability of the Indian paper industry. The Indian paper industry faces the problems of (1) non availability of good quality of raw materials (2) lack of modernization and basic infrastructure (3) increased
emerging environmental issues (4) resource development. These problems will be overcome by the objectives of (1) identification and quality upgradation of alternate raw materials (2) identification of development of technologies that are suitable to indigenous raw materials like resource conservation, quality standardization and environment protection.

3.3 CONCLUSION

In this section, a brief note of formation of Quality System Standards and Environmental system, members of ISO and quality movements in India are presented. It also highlights paradigm of quality management, the prevailing condition of ISO in SPB. It also presents the global production of paper, per capita consumption of Asian countries, and projection of paper demand up to 2020. The next chapter dealt with the conceptual framework that is pertinent to research objectives.
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