

# Implementation of ISO 9000 in a textile mill

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**Abstract** *ISO 9000 quality systems have been developed to provide necessary conceptual and structural input for fulfilling customer needs by ensuring consistent and desired product quality. It is necessary to have an implementation plan, the success of which depends on top management involvement from the beginning. Consultants can also play a major role in this implementation programme. Effectiveness of a system can be judged by higher customer satisfaction through increased employee involvement and product quality improvement. This case study deals with formation of road map, implementation details, road blocks and tactical steps to remove the road blocks, in implementing ISO 9001 within 12 months and achieving better quality product in a textile mill.*

## Introduction

In a changing world, the importance of quality systems (Qs) in organizations' excellence has been felt more and more, because it ensures consistent and desired product quality. ISO 9000 (1987) has evolved and is being updated continuously to provide necessary conceptual and structural input to the development of such a system. As a consequence, customers demand ISO 9000 certification from their suppliers.

Implementation of ISO 9000 standards requires the establishment and development of a documented system, and the involvement of all the employees in adhering to it. This paper gives details of how a textile mill, with the help of a reputed consultancy organization, implemented ISO 9000 within 12 months and thereby achieved better quality products and also obtained the ISO 9000 certificate.

## The organization

The organization is a spinning mill engaged in the development and manufacture of cotton yarn, fancy yarn and other value added products (yarns). The mill is one of the leading exporters of fancy yarns such as slub yarn, core spun yarn and melange yarn, and 30% of its turnover comes from export. Management has a plan to increase the export turnover. The organization's staffing is as follows: top management, 5; middle management, 17; supervisory staff, 22; operators, 1345.

The organization is in a labour-intensive process industry. For implementing ISO 9000, the following points were considered:

- While most of the organizations in India which have obtained ISO 9000 certification are engineering units, other sectors have also taken it up. The wording of the standards

is such as to facilitate easy interpretation for the engineering industry, but interpretation for process industries like textiles requires a deeper understanding, and implementation requires more effort.

- The education level of the employees was low, and there was a language barrier, i.e. only the local language was for all internal communication.
- The time target for implementation was short because of the immediate effort given to exports.
- The mill is located in a rural area and was the first mill to attempt ISO 900 certification in this region.

In order to facilitate the establishment, development and implementation of the system, the organization engaged the services of a consultancy organization. The general approach followed in implementing the system is given in Fig. 1.

The current assessment showed that there was no documented system followed in the mill. So the work started with interacting with top management. Some of the main points are described in the following.

### **Top management involvement**

Top management commitment and involvement were first assured for the planning of implementation of ISO 9000. The management realized the need for proper planning, maintenance and control in implementing the system. Some of the activities taken were:

- Planning for development and implementation of the system and distribution of the plan to all management staff. This was finalized after discussion with the management staff.
- The appointment of a management representative (MR), and a management committee consisting of the managing director (MD) as chairman, the MR as convener and heads of departments as members with responsibility and authority for system implementation.
- The formation of a task force for developing and implementing the QS.
- Ensuring employee participation in the formulation of quality policy and objectives.
- Planning for required training programmes.
- Enabling the management staff and supervisors to understanding the different clauses of the standard, their interpretation and relevance to the organization.
- Helping management, staff and supervisors to develop the system through continuous review.
- Discussion on internal quality audit findings and encouragement of the task force members to remove the deficiencies.

### **Training programmes**

The next step taken by management was to impart necessary training to all employees. Management identified the training needs of personnel at different levels through discussion with the consultants, and a training programme schedule (given in Table 1) was prepared. The training programmes were conducted by the consultancy organization. It was ensured that all employees attended the relevant training programme.

In the second stage, a training programme on implementation of ISO 9000 was conducted by the organization in a top-down manner. Initially the MD and MR trained the other members of the management committee, who later became the trainers for the task

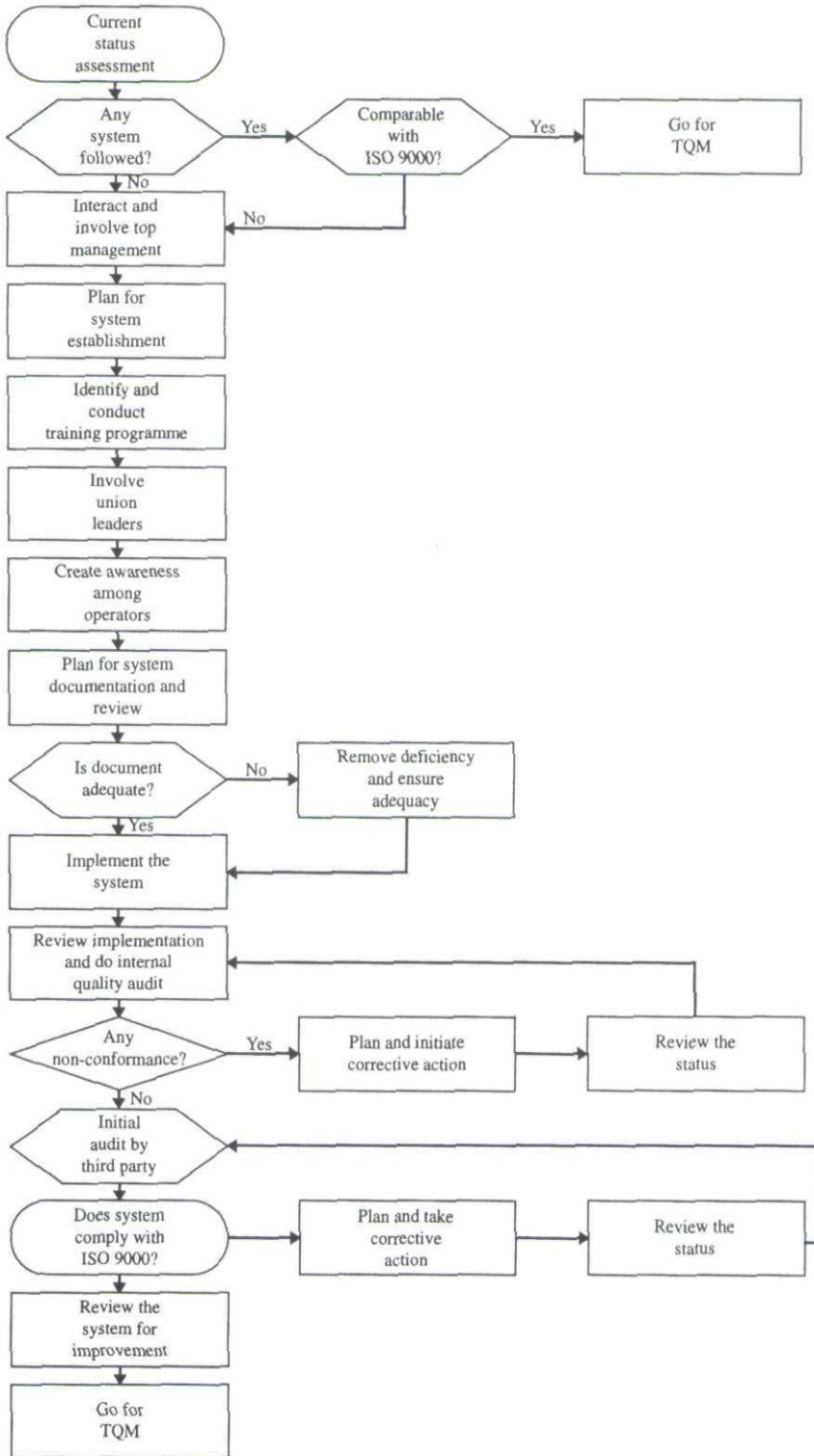
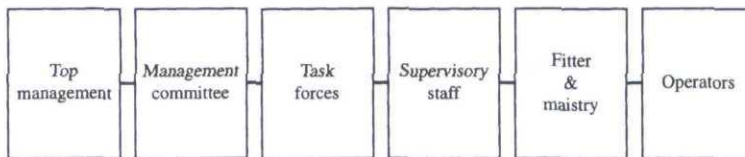


Figure 1. Flowchart for ISO 9000 implementation.

**Table 1.** *Training programmes for ISO 9000 implementation*

| No. | Training programme   | Duration | Subjects/topics   | Level of participation                  | Total participants |
|-----|--|----------|---|---|--------------------|
| (1) | Appreciation programme on ISO 9000                                 | 1/2 day  | Need for system<br>Introduction to TQM<br>ISO 9000 requirements<br>Documentation required   | Top management                          | 5                  |
| (2) | Awareness programme on ISO 9000                                    | 1 day    | Need for system<br>Introduction to total quality management<br>ISO 9000 requirements<br>Documentation required<br>Seven tools for quality improvement | Middle management and supervisory staff | 17<br>22           |
| (3) | Awareness programme on ISO 9000                                    | 1/2 day  | Need for system<br>Benefits of system<br>Documentation<br>Role of operators   | Operators                               | 1345               |
| (4) | Statistical techniques for quality improvement (Montgomery, 1991a) | 3 days   | Seven tools<br>Control charts<br>Process capability   | Middle management and supervisory staff | 20                 |
| (5) | Documentation for ISO 9000   | 2 days   | Plan<br>Structure<br>Method   | Middle management and supervisory staff | 22                 |
| (6) | Interpretation of ISO 9001 clauses                                 | 1 day    | Clause-wise explanation<br>Group discussion   | Middle management and supervisory staff | 24                 |
| (7) | Internal quality audit   | 2 days   | Audit plan<br>Audit procedure<br>Audit reporting<br>Mock auditing   | Selected staff                          | 12                 |

**Figure 2.** *Teachers and participants.*

force members. This process was continued until all the operators were trained, and is shown in Fig 2. Conducting the programme in this above manner helped all employees to understand:

- the role of each employee in maintaining and implementing the system;
- system adequacy in comparison with ISO 9000 standards;
- the system effectiveness and its possible improvement.

## Documentation

Management planned to implement the ISO 9001 model, as it is the most appropriate to the organization's activity. Different activities carried out by the organization were reviewed, and it was found that only a few formats were used for recording necessary data. There were no documents available for any activity, and generally it was carried out based on practice or on verbal instructions. It was decided to follow the standard practice of documentation with minor modification. The documentation structure is given in Fig. 3. It may be noted that the document structure has been modified by developing standards for raw material, finished and semi-finished material etc., and making it a separate document. The idea is to respond to the changing environment and customer demand effectively.

Standards were prepared based on the organization's requirements, and due care was taken to achieve this during system development. Various levels of documents were prepared by the concerned task performers themselves and reviewed by the head of the departments. The number of documents prepared in each department is given in Table 2.

During the development of the system, progress was continuously monitored by top management. Top management took special interest in encouraging the task performers to prepare the document within the target date. It is worth noting that because of the continuous

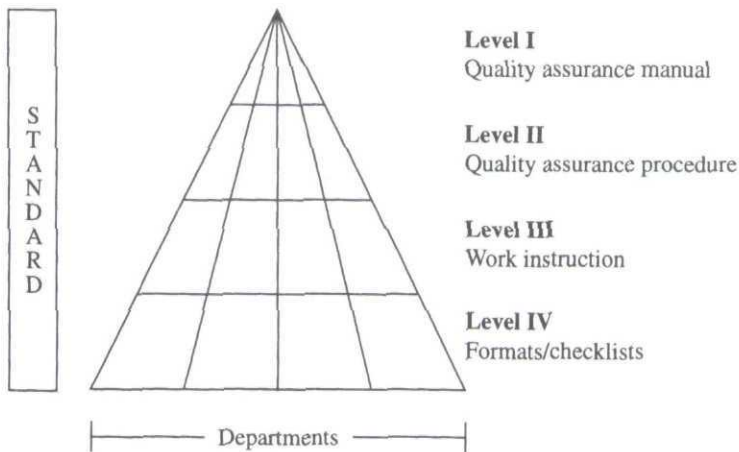


Figure 3. Document structure for the system.

Table 2. Documents prepared for ISO 9000 implementation

| No.     | Dept/function     | Quality assurance procedures | Work instructions | Formats/checklists |
|---------|-------------------|------------------------------|-------------------|--------------------|
| (1)     | Management        | 4                            | —                 | —                  |
| (2)     | Production        | 4                            | 36                | 5                  |
| (3)     | Maintenance       | 5                            | 31                | 2                  |
| (4)     | Marketing         | 2                            | —                 | 8                  |
| (5)     | Purchase          | 4                            | 8                 | 5                  |
| (6)     | Personnel         | 2                            | 2                 | 6                  |
| (7)     | Quality Assurance | 7                            | 37                | 9                  |
| Overall |                   | 31                           | 103               | 35                 |

monitoring by top management, documentation of the system became possible within 8 months. During documentation, it was observed that certain activities can be performed more effectively using formats/checklists. For example, contract review is now carried out more effectively by using checklists.

### **Continuous review**

To ensure effectiveness, the system implementation process was continuously reviewed by the management committee and task force, starting with development. Before any review, task performers were asked to ensure the correctness of the documentation, implementation and compliance. The process of implementation was thus easy, effective and efficient.

For each review, due care was taken over the following points:

- (1) Uniformity in each level of documents.
- (2) Whether required information was documented or not.
- (3) Documents assured meeting the standard wherever necessary.
- (4) Improvement of the system.

On average documents of levels I to III were reviewed five times, and in the process more clarity was built up among the employees. It is worth noting that, through continuous review, management ensured that the system was implemented within 12 months.

### **Union involvement**

The organization had two registered unions. Although the unions differed on many issues, for the implementation of system they were together in cooperating with the management. Management recognized the role of unions and interacted with them at various stages. Training programmes on system implementations for operators were arranged by them. During training programmes, union leaders as well as other members took active participation and had their doubts clarified in connection with system implementation.

In the later stages, union leaders took an active role, explaining to the workers their role in implementing and maintaining the system. It is worth noting that unions worked hand-in-hand with management to fulfil the organizational goal.

### **Awareness**

Awareness of the system development and implementation among the employees was created through training programmes. The quality policy was printed in poster form and displayed in prominent places. Top management reviewed the awareness by interacting different levels of operators.

In the organization, there is a tradition that operators decorate their own department on a local festival day. As part of their decoration, the workers displayed placards depicting the quality policy and their commitment to implementing and maintaining the system. This clearly shows the level of awareness among the workers.

### **Internal quality audit**

Necessary training was provided to selected members on internal quality audit (IQA). Before, training, audit was carried out informally twice to give hands-on experience and a grip on auditing.

**Table 3.** *Non-conformities during IQA*

| No.   | Clause name                     | No. of NCRs |
|-------|---------------------------------|-------------|
| (1)   | Quality records                 | 33          |
| (2)   | Document control                | 26          |
| (3)   | Process control                 | 18          |
| (4)   | Contract review                 | 8           |
| (5)   | Purchase                        | 5           |
| (6)   | Identification and traceability | 3           |
| (7)   | Others                          | 10          |
| Total |                                 | 103         |

Audit checklists were prepared by the management committee members. Auditors were selected from the participants of the training programme on IQA and were asked to audit by using the checklists. Initially, all the departments were audited twice, and then a formal audit took place. Non-conformity reports (NCRs) were raised and closed within a week. This was verified in the same week. In IQA, 103 NCRs were raised and six of them were major non-conformities. Maximum NCRs were raised with respect to clauses 4.5 and 4.16, i.e. document control and quality records. These are shown in Table 3.

All NCRs were discussed during management review, and the management committee ensured that the right corrective and preventive actions were taken.

### Quality improvement studies

During review, formal and informal audits, certain deficiencies were identified. In order to remove these deficiencies, it was felt that executives had to study the problem in details and solve it. Teams were formed and took up the studies. As a result, encouraging results in quality and productivity were achieved.

One of the deficiencies was identified at first processing stage, i.e. at the blow room. Cleaning efficiency (CE) at the blow room is an important quality characteristic, and this was 49% against the standard of 60% (Ratnam & Chellamani, 1990). The problem was discussed by the team, and through brainstorming and cause and effect diagrams, possible causes were identified. It was felt that by controlling the causes, i.e. process parameters, the standard CE could be achieved, and through the 'design of experiment' (Montgomery, 1991b) technique the optimum levels of process parameters could be determined.

The levels of process parameters were selected through standards and experiences. The experiment was carried out using orthogonal array (Taguchi, 1988) and, through analysis of variance (ANOVA), critical process parameters and their optimum levels were identified. The findings were implemented and the CE had improved to 64%. Other studies which yielded encouraging results are given in Table 4.

The systems have been developed in all areas and thus the organization is able to maintain the results. Many studies have also been made on continuous improvement, even after obtaining the certificate, and these are in progress.

### Certification (initial) audit

Four months after the trial implementation, audit leading to certification was carried out by a leading certification agency. Twenty-seven NCRs were raised by the auditors, and they

**Table 4.** Results of quality improvement studies

| No. | Area                   | Problem  | Result achieved   | Techniques used                                    |
|-----|------------------------|--|---|--|
| (1) | Production             | Hard waste at cone winding was at higher level (1%)  | Waste was reduced to 0.7%                                       | Seven quality control tools                        |
| (2) | Production             | High% at draw frame (3.5%)   | CV% brought down to 2.8%  | Spectrogram analysis                               |
| (3) | Purchase               | Money blocked in inventory was high. The ordering cost was more, as the average no. of orders was 25/day | Inventory was reduced and the no. of orders came down to 10/day | Scientific inventory management                    |
| (4) | Personnel              | Absenteeism among operators was 4%   | Absenteeism reduced to 2.5%                                     | Seven quality control tools                        |
| (5) | Electrical maintenance | High power consumption at ring frame   | Power consumption was reduced by 5%                             | Seven quality control tools and test of hypothesis |

**Table 5.** Non-conformities during initial audit

| No.   | Clause name                     | No. of NCRs in: |               |
|-------|---------------------------------|-----------------|---------------|
|       |                                 | IQA             | Initial audit |
| (1)   | Quality records                 | 33              | 2             |
| (2)   | Document control                | 26              | 4             |
| (3)   | Process control                 | 18              | 6             |
| (4)   | Contract review                 | 8               | 4             |
| (5)   | Purchase                        | 5               | 5             |
| (6)   | Identification and traceability | 3               | 1             |
| (7)   | Others                          | 10              | 5             |
| Total |                                 | 103             | 27            |

were closed during the audit period itself. These are given in Table 5. At the 'closing meeting' the auditors recommended the organization for certification.

### Follow-up

During development and implementation of the system, management realized the benefits of the system. In order to achieve organization performance excellence, they are moving towards total quality management. Some of the steps already taken are:

- Continuous review to maintain, sustain and improve the QS.
- Imparting statistical knowledge to the executives for problem-solving.
- Making studies into quality and productivity improvement.
- Auditing the system for its effectiveness.
- Review of customer feedback and corrective action.

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