Note
This document governs the mandatory elements of Siemens Quality Management along with implementation control through self-assessments. Global implementation of these elements is mandatory. They also apply to all affiliated companies. This document is also intended for the information of our customers, suppliers and any other interested groups.
Table of Contents

Foreword 4

I. Quality: vision, principles and strategy 6

II. Siemens Quality Management System based on the mandatory elements 7

   Excellent processes for quality 8
   1. Customer integration 9
   2. Quality standards in processes and projects 12
   3. Consistent supplier management 17

   Quality controlling 20
   4. Business-driven quality planning 21
   5. Focused quality reporting 22

   Quality mindset and outstanding capabilities 24
   6. Comprehensive qualification for quality 25
   7. Continuous improvement 26

   Leadership for quality 28
   8. Spirit by management involvement 29
   9. Control and support role of the quality manager 31

III. Self-assessment 33
The innovative strength of Siemens and the outstanding quality of our products and solutions are central to the success of our company.

The driving force behind this success originates in the excellence – one of our three corporate values – that distinguishes our company and its employees: people who aspire to peak performance every day, outstanding technologies and processes that are continuously being optimized.

These aspects considerably strengthen our outstanding reputation on the world market. We must earn this reputation anew all the time, constantly strengthening it.
All of this implies a quality culture that places the focus on the customer and in which ‘Continuous Improvement’ has top priority.

A quality culture stems from the people who define it. The dynamic basis from which to implement our demanding goals consists of:

- Executives who are aware of their quality responsibility
- Employees characterized by an extraordinary quality mindset
- Highly qualified, responsible quality managers
- Excellent processes relating to all aspects of quality
- Efficient and effective quality controlling

People who follow these principles make the quality culture at Siemens a tangible demonstration of the performance we expect of ourselves. This is how we inspire the enthusiasm of customers worldwide for our company and our products, day after day.

Peter Löscher
President and Chief Executive Officer of Siemens AG

Siegfried Russwurm
Member of the Managing Board of Siemens AG
I. Quality: vision, principles and strategy

Quality is an essential component of the Siemens brand. Our vision of quality is this: “Siemens stands for world-class quality.”

Our vision of quality is based on the following principles:

- Quality is determined by our customers.
- Quality means understanding and exceeding customer expectations.
- Quality starts at the top.
- Quality is a value of all employees.
- Quality needs to be integrated into products and processes at an early stage.
- Quality is a matter of measurement and transparency.
- Quality needs continuous improvement.

Our customers' loyalty is the consequence and result of Siemens quality. This quality is realized by competent, motivated and responsible employees.

Our vision of world-class quality calls for standards. These standards are set down in our quality strategy, which is defined as follows:

“Implementation of the mandatory elements of Siemens Quality Management and continuous improvement of people, process and product quality.”

The circular, “Policy of Siemens Quality Management,” published by the Corporate Quality Management Department (C top & CQM) provides comprehensive details on this subject. This document defines the mandatory elements as an integral component of Siemens Quality Management.
The mandatory elements of Siemens Quality Management were derived and defined from benchmarks with other leading companies. They provide clear guidance for their application in daily practice. Together with the quality strategy, they form our Quality Management System. The mandatory elements are divided into four categories:

**Excellent processes for quality**
1. Customer integration
2. Quality standards in processes and projects
3. Consistent supplier management

**Quality controlling**
4. Business-driven quality planning
5. Focused quality reporting

**Quality mindset and outstanding capabilities**
6. Comprehensive qualification for quality
7. Continuous improvement

**Leadership for quality**
8. Spirit by management involvement
9. Control and support role of the quality manager

We use specific indicators to measure each of these elements, thus systematically assessing the maturity level of our organizational units in terms of quality. From the results obtained, we derive specific improvement actions in order to ensure continuous performance improvement.
Excellent processes for quality
1. Customer integration

How we work hand-in-hand with our customers

Siemens stands for world-class quality. This is not by chance. Central to our outstanding reputation is customer integration. Understanding customer expectations and incorporating them into all relevant processes is the foundation of our work. Only when we have detailed knowledge of what concerns our customers, and the products and solutions they need now and in the future, can we make targeted contributions to their success. Allowing us to stay ahead of our competitors.

We accomplish this through continuous, personal interaction with customers and targeted handling of customer information. Our customer integration rests on four pillars:

1.1 Analytical tools for customer requirements and market research

Customer requirements are precisely defined and implemented. To accomplish this, we consistently use a systematic requirements-management approach that includes analytical methods; this permits us to identify all customer requirements and address them during product development. We avoid overengineering and
develop products that are tailored to customer and market expectations. We harness newly gained knowledge of customer preferences and applications expertise for innovations and new business opportunities. We identify customer requirements using precise, measurable specifications at the beginning of the definition phase for new products, systems and installations. We work with the customer to track and update these requirements on a continuous basis. The latest requirements list and specifications are available to all employees involved in the development process. Changed customer requirements are communicated and coordinated accurately, promptly and in a traceable manner.

1.2 Professional communication with the customer

Fast bi-directional feedback mechanisms allow us to optimize the satisfaction of our customers and their trust in us. Immediate personal interaction between our management and the customer ensures prompt responses to customer needs. We establish a dialog with each customer relative to quality concerns; we listen to the voice of the customer and are eager to satisfy specific requirements. We monitor the market and provide customers prompt status updates on their requests. Clearly defined performance indicators help us guide customer projects and enable us to easily identify issues requiring root cause analysis.
1.3 Measuring and analyzing customer satisfaction

The satisfaction of our customers is our primary quality objective. To increase customer satisfaction, we perform customer satisfaction management via different components: strategic tools such as Net Promoter Score aid us in systematic measurement of our customers’ satisfaction. The Net Promoter Score measures the likelihood that customers will recommend us and our products. We also measure customer satisfaction on a project basis and in service operations. Additionally, topic-specific workshops are carried out as required with a focus on customer satisfaction.

1.4 Complaint management

Errors are a part of human conduct and can never be completely ruled out. Therefore, our professional approach to customer complaints is indispensable to ensure long-term customer satisfaction, secure customer retention and strengthen customer loyalty. The efficiency of our complaint management is achieved through well-defined roles for each of the relevant processes, with clear responsibilities and escalation paths. Each customer complaint is recorded in a structured manner and forwarded to the responsible entity for a fast and viable solution. Systematic root cause analyses provide us with the mechanisms to develop speedy corrective and preventive measures in our processes and projects.
2. Quality standards in processes and projects

Why we deliver excellent quality

Quality is the result of consistent action at all levels. To this end, our quality standards for processes and projects are fundamental. They provide the clear direction that products and solutions of world-class quality require.

Quality standards in processes and projects are secured by standardized processes, preventive measures and quality gates. Quality gates are key milestones we have identified in the process and project sequence.

2.1 Standardized processes

Stability and discipline in processes are essential prerequisites for processes of high quality. To ensure this, we standardize our processes. This makes them easy to use by all employees while providing transparency and comparability across different projects. Processes are constantly adjusted to the optimal workflow. Standardization also permits better use of synergies between business units. Furthermore, our process standards and best-practice sharing form a solid foundation for continuous improvement.

The Reference Process House (RPH) is an essential part of the Siemens Process Framework (SPF). It uses a defined layer structure to describe the Siemens management, business and support processes as “target processes.” It enables configuration of continuous business processes and covers product, system, project and service activities (cf. Graphic 1).
### Management Processes

- Strategic Planning & Controlling
- Financial Planning & Controlling
- Enterprise Governance
- Internal Audit

### Business Processes

#### Customer Relationship Management (CRM)

- **Plan**
- **Understand**
- **Sell**
- **Care**

#### Supply Chain Management (SCM)

- **Plan**
- **Source**
- **Make**
- **Deliver**
- **Return**

#### Product Lifecycle Management (PLM)

- **Plan**
- **Product Portf. Management**
- **Define**
- **Realize**
- **Commercialize/Operate**
- **Phase Out**

### Support Processes

- Quality Management
- Environment, Health & Safety
- Intellectual Capital Management
- Human Resources
- Financial Management
- Procurement
- Process & Information Management
- Communication
- Real Estate Management
- Administration & Infrastructure
- Operating Rules

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Graphic 1: Siemens Reference Process House
Standardized processes are also the essential elements of the Siemens Production System (cf. Graphic 2). This concept applies company-wide and is focused on production as the source of the supply chain process. The main goal is to reduce cycle time between incoming order and product delivery. To achieve our goal, we identify non-value-added activities and/or processes and eliminate them, replacing them with new standards that we can then improve on an ongoing basis.

The Siemens Production System revolves around the concept of lean production. All production steps are organized around one central element: customer benefit. Here, quality means that all processes are perfectly coordinated with one another, resulting in defect-free products made without waste of time or resources. Our zero-defect principle means that there are cross-process teams working continuously to optimize all of the steps.
Another example of standardized processes is PM@Siemens. Project management is a key success factor for Siemens. PM@Siemens promotes excellence in project execution through synchronization and standardization of processes, methods and tools. In addition, this program provides continuous and sustained improvements, adding to our strengths in project management. PM@Siemens applies to all organizations with project business: 12 modules describe measures for the management of a project, defining the roles of the people and the organizational framework needed to implement a project organization.

2.2 Preventive measures

Defects that occur at an early stage of a process or project can give rise to non-conformance costs. To prevent this, we define business- and customer-specific standards for preventive actions in addition to the standards used in our processes and projects. Extensive and unique knowledge of the products and systems to be developed helps us identify technical and financial risks at an early stage.

Preventive quality management means regularly performing risk management and devising a quality plan at the early stages, e.g. applying the principles of failure mode and effect analysis (FMEA). Additional preventive methods are aimed at robust design of the production process and careful control of production itself.

Prompt and systematic root cause analyses help ensure that defects are eliminated and their recurrence prevented. These analyses are cross-functional and involve all employees concerned.

Because we leave nothing to chance, we ensure – through standardized processes, preventive measures and quality gates – that our customers receive products and solutions of world-class quality.
2.3 Quality gates

Quality gates are key milestones we have identified in the process and project sequence: at these points, we monitor the qualitative and quantitative fulfillment of process and project goals. A release to the next step in the process is given only if criteria are successfully met. This way, we can identify possible causes of defects at an early stage and prevent negative effects. Our preventive quality management attaches the greatest importance to content and procedures (cf. Graphic 3).

<table>
<thead>
<tr>
<th>Contents</th>
<th>Procedures</th>
<th>Mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfillment of customer requirements must be reviewed in full – i.e. on an ongoing basis</td>
<td>Quality gates should be placed at the point in the process/project at which quality-relevant, critical decisions are anticipated</td>
<td>Prevention is better than cure!</td>
</tr>
<tr>
<td>Reviews must be performed according to precisely measurable criteria</td>
<td>Quality gates should be carefully prepared with readiness checks</td>
<td>Instead of saying “We will solve all the problems,” seriously consider existing alternatives first!</td>
</tr>
<tr>
<td>An alternative problem solution must be found for all nonconformities</td>
<td>60-minute quality gate check on a critical quality-related decision-making basis only</td>
<td>Concentrate on solving the problem, not on good news!</td>
</tr>
</tbody>
</table>

Graphic 3: Quality gates
3. Consistent supplier management

Why our suppliers are the best

Our suppliers are a key component of our success. Only if our suppliers provide excellent materials and services can we guarantee our customers world-class quality. Our consistent supplier management approach creates the conditions for this and ensures our competitiveness.

In supplier management, supply chain management and quality management have joint cross-functional responsibility for ensuring the quality of supply. Ongoing optimization of our supplier network and of the processes and sequences, taking into account all of a product’s development and subsequent costs (total cost of ownership), makes a systematic contribution to assuring our competitiveness. This calls not only for the involvement of all relevant functions (e.g. purchasing, quality, development and production), but also for the synchronization of processes in product lifecycle management, project management and supply chain management.

Consistent supplier management at a glance

Cross-functional teamwork involving supply chain management and quality management secures delivery of the highest level of quality. Early involvement of suppliers in product planning, as well as evaluation and development of our suppliers, are key factors that support a supplier network with which we can deliver products of world-class quality.
The core elements of supplier management (cf. Graphic 4) are:

- Supplier selection
- Supplier evaluation, including strategic and risk evaluation
- Supplier classification
- Supplier development
- Phasing out

Graphic 4: Supplier management
The following elements are fundamental when it comes to quality-oriented supplier management:

- **We integrate suppliers during the early definition phase of a product.** Integrating the expertise on both sides improves quality, secures innovations and minimizes risks. The same holds true for our internal suppliers.

- **New suppliers have quality assurance agreements put in place to properly govern the partnership right from the start.** Qualification audits of suppliers ensure adherence to our requirements.

- **Detailed requirements and specific targets define the quality standards our suppliers’ products and services are required to meet.** Measurable specifications prevent the risk of false interpretations.

- **Regular evaluations of the supplier quality achieved and auditing of suppliers provide transparency and initiate continual improvements.**

- **Providing suppliers with targeted support helps minimize risk as much as possible.** We work together in a spirit of partnership to achieve world-class quality. The goal is to ensure on-time, high-quality delivery. This is accomplished by using professional processes and methodologies such as FMEA and 8D. 8D refers to the eight process steps required to solve problems and prevent future defects.

- **Supplier information is centrally stored and available to all units company-wide.** This information is used for operational decision-making, preventive measures and supplier development.
Quality controlling
4. Business-driven quality planning

How we set goals for ourselves

Quality does not just happen. It requires setting clear goals and detailed planning. The proven tool for accomplishing this is business-driven quality planning, which we use to identify and analyze complex future business developments. This is how we can identify potential risks and prevent problems before they arise.

Business-driven quality planning is the responsibility of management. Targets are set by agreements with business managers within the framework of the target-setting process. Business managers are supported by quality managers, and quality targets thus become an essential component of our business goals.

The central aspects of strategic quality planning are:

- Identification of all critical business factors that may impact quality
- Use of self-assessments and benchmarks to establish demanding quality targets at all levels
- Definition of processes and methods that ensure these demanding targets are met
- Continuous and consistent quality planning in development projects and customer projects
- Improvement measures to enhance quality – these are continuously reviewed and prioritized by management
- Selection of quality criteria and key performance indicators (KPIs) to provide a framework for measurability of the implementation of objectives
- Personal quality targets for employees and teams are agreed in target-agreement discussions

Business-driven quality planning at a glance

Managers and quality managers work together to analyze future business developments, quality-relevant business factors and customer expectations. They translate the results of these analyses into demanding quality targets. They continuously define improvement actions and measure target achievement through the use of key performance indicators (KPIs). Quality targets are part of our business goals; their importance to each employee is made clear in the employee target agreements.
5. Focused quality reporting

How we measure quality and make it visible

Regular and focused quality reporting serves to inform all employees of the extent to which we have reached the targets defined in our quality planning. At the same time, it creates transparency about the effectiveness of the Quality Management System and the company-wide quality level.

A responsibility of the quality managers, quality reporting, has a clearly defined scope and framework. It is carried out at all levels of the organization. The quality manager adapts the degree of detail to the requirements of the individual level of the company. Reports are always issued directly to the respective management, to the relevant specialized function and to the next-higher quality-management level. There are defined individual steps that also contain an escalation process. As part of the Management Review, the Quality Management System is regularly evaluated by management and its management team.
for its effectiveness in light of internal and external requirements (Siemens guidelines, standards, customer requirements).

Core elements of the regularly conducted quality reporting are:

- Compilation of quality metrics and key performance indicators (KPIs) such as customer satisfaction, supplier quality and non-conformance costs for the respective reporting level
- Description and documentation of specific quality incidents
- Analysis of trends and deviations
- Root cause analyses and measures in response to quality problems that occur
- Quality metrics from the most important projects (customer, development, improvement projects)
- Results of management reviews of the quality level of the organizational unit

In addition, cross-process quality reviews can be used to compare quality reports with quality planning targets. Improvement measures can be initiated if needed.

Focused quality reporting at a glance

We use focused quality reporting to document the extent to which targets have been met. Reporting is in the hands of the quality managers and is conducted in clearly defined steps. Among other things, it contains quality criteria and key performance indicators, specific quality incidents, error trends and deviations, root cause analyses and steps taken in response to quality problems that occur.
Quality mindset and outstanding capabilities
6. Comprehensive qualification for quality

How we develop our employees

A crucial factor for quality are the people who work in our company. We see to it that they have the expertise and capabilities they need to perform their jobs. Comprehensive qualification for quality is thus a natural component of our corporate culture. Those who belong to a world-class company must also receive first-class development.

Training opportunities are made available to all employees. This applies in particular to quality managers who, as experts in their fields, must demonstrate an expertise of the relevant quality tools.

Based on a detailed analysis, the managers in the departments determine the qualification requirements for each employee. They make this determination cognizant of existing and required areas of expertise as well as development potential.

In terms of employees and their qualifications, competence management has the following specific tasks:

- Professional analysis of skills for quality-related tasks
- Identification of individual qualification gaps
- Development of experts and expansion of their expertise

Working jointly with Human Resources (HR), quality managers assist line managers with the planning and control of qualification processes for all affected employees.

Comprehensive qualification for quality at a glance

We see to it that our employees have the expertise and capabilities they need to perform their jobs. This is why we analyze their skills and development potential and expand their skills in individually designed and practice-oriented training.
Regular, in-house, business-specific training by experts provides continuing education to meet the requirements of everyday work and to address new challenges. Training conveys basic quality topics, lessons learned, individual procedures and methods, as well as technology and system expertise.

The information delivered has a high level of practical applicability and can be used directly in the work setting. As part of the qualification effort, our Learning Campus organizational unit provides effective and comprehensive skills-development opportunities to all Siemens employees. These offerings range from seminars, e-Learning and individual workshops to entire projects.

The motto “Good is not good enough” emphasizes that continuous improvement is a core component of our processes. The goal is to continually optimize our products and solutions in order to consolidate or expand our market position. Fundamental to this effort is a corporate culture in which we openly communicate errors and remedy them without delay.

Every executive and every process owner is responsible for the results and improvement of their department and processes. Quality managers provide advice and assistance with the fulfillment of these responsibilities.
Continuous improvement takes place in a spirit of cooperation based on trust: as part of a problem-solving culture, all employees are called upon to communicate errors openly so that they can be remedied at once. Just as fundamental is the commitment and participation of management in optimization processes. To develop improvements, the teams responsible are exempt from their regular work. They are also provided with the facilities and resources they need to develop these improvements. With the quality manager, the teams directly integrate the resulting changes into the affected processes.

Continuous improvement requires clearly defined structures and roles; it is measurable. It is conducted according to clear process specifications and with the aid of pragmatic tools such as the top+ program, Kaizen, Six Sigma, CIP groups. The Japanese term “Kaizen” stands for continuous, incremental improvement and applies to executives and employees alike. “Six Sigma” refers to the use of statistical methods to improve products and processes.

3i, the idea-management program at Siemens – which stands for ideas, impulses and initiatives – is another element of continuous improvement.
Leadership for quality
Quality has top priority at Siemens. Every manager carries full responsibility for quality and provides an outstanding example of quality awareness to customers, employees and partners. Working side by side with their employees, managers are committed to problem-solving. Thus, managers as role models, being actively involved, give rise to our distinct quality culture.

8. Spirit by management involvement

How we set an example of commitment to quality

This responsibility is particularly evident in three areas: in leading with quality targets, in open communication of quality issues and in building quality competencies:

- Managers set demanding quality targets to achieve quality at a world-class level.
- They define quality targets for all facets of our business, customers, employees, products and processes.
- They are personally committed to handling problems as improvement opportunities. To accomplish this, they call for cause-and-effect analysis and monitor improvement actions.
Managers communicate directly with all employees about the quality level achieved, and about customer satisfaction and customer complaints.

They make quality visible, whether outstanding or poor, to provide employees a better sense of their own quality performance.

They identify outstanding performance by individual employees or teams and motivate other employees to improve quality through imitation.

Managers cultivate the quality expertise of all employees through training and interdisciplinary teamwork.

They establish the expert role of quality managers through targeted development of the best talents, opening career paths leading them to other management positions.
Quality managers’ control and support role is of fundamental importance to effective quality management. The quality manager serves as a consultant to various teams, as a business coach to management and as an independent controller. The quality manager is directly involved in all relevant processes and projects of his or her corporate unit, making sure the services we provide are of top quality.

Quality management is a cross-functional task. This is why the independence of the Quality Department and of the individual quality managers must be ensured in processes and projects and coordinated with top management. Quality managers’ duties and authority, together with their expertise and capabilities, are described in detail in competence profiles.

Specifically, the quality manager is responsible for performing the following duties:

- Assisting the organizational units and management in setting quality targets and developing quality standards for products, services, processes and management systems, and is commissioned by the head of the organizational unit to monitor implementation of these standards.
- Reporting to the head of the organizational unit with regard to the current quality level, trends, deviations from quality targets and improvement activities; he or she uncovers any weaknesses and sees to it that they are eliminated.

What is our quality managers’ work?
Discovering weaknesses and risks impacting quality and customer satisfaction and ensuring that these are thoroughly eliminated.

Supporting and consulting the head of the respective organizational unit along with process experts and project managers in the solution of organization-wide quality issues.

To fulfill these duties, the following conditions must be met:

- Complete involvement of quality managers in all processes and projects to emphasize the importance of operational and preventive quality management (cf. customer integration, quality standards in processes, supplier management).

- Quality managers must have strongly developed conflict-management skills: they are not only authorized but also obligated to say “no” in critical situations, particularly with regard to development, production, delivery and acceptance releases.

- The quality manager has the authority to stop processes. Clear escalation paths to the CEO/head of the organizational unit and the quality manager of the next-higher level are defined for any critical quality deviations that cannot be corrected at the organizational level at which they occur and that are expected to have a significant negative influence on business performance.

- Workplace rotation of quality managers to other functional areas to provide them with experience across departmental boundaries.

In keeping with company-wide competence profiles a concerted effort is made to promote suitable talents.
To review implementation of the mandatory elements in our company’s processes, along with other control tools we have defined a self-assessment process that is to be carried out by the organizational units on a regular basis. Self-assessment is the responsibility of the heads of the organizational units and is carried out by the quality manager.

The goals of self-assessment are:

- Monitoring of the efficient implementation of the mandatory elements
- Assessment of the maturity level of the mandatory elements within the organization
- Identification of the strengths and weaknesses of the existing Quality Management System
- Derivation of improvement measures with clear prioritization for their implementation
- Sharing of best practices

Quality managers carry out self-assessments using defined checklists. Methodologically speaking, they have three different approaches available to them. They can conduct self-assessment in interview form, in moderated workshops or as an assessment by experts in the area.

Self-assessments can also be integrated into existing, established processes, such as integrated management system audits.

The results of self-assessments are used as inputs to management reviews.