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Management manual

Quality, safety, occupational health and safety, and environmental protection at Siemens Mobility

siemens.com/mobility
Change is the only constant in our world as we face new challenges from globalization, urbanization, worldwide climate change, and Earth’s growing population. The emergence of new megacities and urban conglomerates mean constant change for our mobility as well. We need safe, fast, affordable, flexible, and environmentally sound options for moving both goods and people. And now more than ever, we must learn to optimize how we utilize our existing infrastructure, which cannot be expanded indefinitely. In Germany alone, we expect the volume of local rail traffic to rise from 6 million to 10 million passengers per day. In the United States, the volume of freight transport is expected to grow to 4 billion metric tons annually by 2050. Meanwhile, traffic on the roads is in danger of total gridlock. The density of automobile traffic will triple in India, quadruple in Indonesia, and grow tenfold in China. The increased density of cars in traditional private transport is no longer compatible with livable cities. Many areas have already had to issue driving bans. This explains the growing importance of both intermodal solutions and public transportation.

Improving operational safety, availability, throughput and the passenger experience – Siemens Mobility’s smart transportation solutions use innovative IT to get goods and people quickly and safely to their destination at an affordable price and with a low environmental impact. We are a preferred partner to cities, municipalities, railroad operators, and local transportation companies, who turn to us for efficient and reliable rail vehicles, management solutions for road and rail, and a comprehensive portfolio of maintenance and other services. We pursue uncompromising standards of quality, safety, occupational health and safety, and environmental protection coupled with continuous innovation and performance you can count on.

Smart, efficient mobility solutions – for today and tomorrow
Introduction

Our thinking revolves around mobility, and we are already shaping the mobility of tomorrow. We bring the latest technology trends to road and rail and deliver greater sustainability, efficiency, and reliability – with smart solutions for efficiently moving people and goods. We rigorously focus on solutions that are forward-looking, reliable, and will help our customers offer their passengers more than just transportation from A to B. Our solutions ensure maximum availability, increased throughput, and – last but not least – the best possible travel experience.

Our global customer base appreciates the innovative power of our products and solutions, together with their reliability, safety, durability, sustainability, and cost-effectiveness.

We see it as our responsibility to our customers, partners, and employees to meet this standard of quality every day.

We fulfill this responsibility in our commitment to ensure and continuously improve our high standards of product quality, environmental protection, health management, and safety through a comprehensive management system.

For us, this also means that our customers around the world can count on uniform principles of quality, safety, occupational health and safety, and environmental protection:

Quality, safety, occupational health and safety and environmental protection are personal
Everyone has a contribution to make. That is how we will meet the expectations of our customers, our employees, and society as a whole.

Quality, safety, occupational health and safety and environmental protection are obligatory
Everyone is involved in maintaining and constantly improving the processes.

Quality, safety, occupational health and safety and environmental protection are all-inclusive
Everyone contributes to the success of our company with their creativity and commitment.

The management system outlined in this manual is obligatory for all managers and employees of Siemens Mobility.
Why we need uniform processes and clear cut rules ...
Management system

This manual outlines the key points of the Siemens Mobility’s management system and defines the general requirements for all organizational units in consideration of internal and external influencing factors. The management board drives the development and implementation of the management system through planning and targets and ensures a system of controls.

The management system is obligatory for all employees. The documentation structure is outlined in the section entitled Documentation. The organizational units are responsible for citing, substantiating, and documenting any exceptions to the requirements of ISO 9001 or other standards that may be necessary. Holding companies listed in the Siemens Mobility’s organizational chart may have their own independent management systems. The same applies to organizational units whose unique business mandate requires a separate management system.

The management system documentation – including all methods and procedures – is available to all employees in the organizational units in structured form. It may also be accessed by external personnel for auditing purposes, but is otherwise intended for internal use only.

Implementation and assessment

The management system is focused on satisfying customer requirements and the expectations of all interested parties of relevance, and ensuring compliance with the law and company policies. It meets the Siemens quality management standards and the requirements for a quality management system set forth in ISO 9001, for a maintenance system in accordance with national railway legislation, and for an occupational health and safety and environmental management system (EHS) as set forth in ISO 14001 and OHSAS 18001.

Management monitors and assesses its implementation, effectiveness, and efficiency.

Depending on the requirements of the markets or customers, the following standards or guidelines have also been met:

- International Railway Industry Standard (IRIS)
- Capability Maturity Model Integration (CMMI)
- Entity in Charge of Maintenance (ECM)
Processes

Our claim: reliable process quality ...
Effective and efficient processes make up a key element of our management system. They ensure that our products and services meet the specified requirements to the complete satisfaction of our customers and everyone concerned.

These processes are divided into three, closely intermeshed process categories:

- The general specifications for the core processes are formulated and controlled in the management processes.
- The business and operational processes encapsulate all business activities in precisely coordinated sub-processes: from product origin and acquisition to project management, hand-over to the customer, and after-sales service.
- All supporting activities are included in the support processes.

Process coordinators look after the various subordinate activities in all three categories. They plan, supervise, and document each individual process according to customer-specific and product-specific criteria. This involves considering risks and opportunities affecting both the organization and all interested parties of relevance. Appropriate methods, e.g. process performance indicators, are used for monitoring and control. Elements of quality management, occupational health and safety, and environmental protection are integral components of these processes. The same applies, wherever legally required, to elements of safety and maintenance management.

The function and efficacy of the core processes are ensured by the consistent application of project management throughout, and by the use of quality gates.

Our aim is to make all processes staff-oriented, robust, transparent, and reproducible at all times with optimum integration of our partners.

... with integrated activities for occupational health and safety and environmental protection.

Management Processes

- Strategic Planning & Controlling
- Financial Planning & Controlling

Business and Operational Processes

Customer Relationship Management (CRM)
- Plan
- Understand

Supply Chain Management (SCM)
- Plan
- Source

Product Lifecycle Management (PLM)*
- Plan
- Product Portfolio Management

* Tailored for specific business requirements

Support Processes

- Quality Management
- Safety and maintenance management
- Environment, Health & Safety
- Intellectual Capital Management
This pictured process house is the basis for the specified process houses within the Business Units.

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Business policy

The principles of our business policy in our effort to achieve business excellence are as follows:

- We consider it our primary responsibility to achieve utmost satisfaction with all our customers and cultivate a lasting trust in our products and services.
- We aspire to constructive, long-term, trusting relationships with our partners around the world in compliance with the law and the highest ethical standards.
- We foster competence, creativity, and achievement potential in our employees.
- We are very aware of our social, environmental, and economic responsibility for sustained development.
- Our efforts to protect the life and health of our employees and other people as well as to conserve natural resources influence our thinking and actions and help to safeguard our competitive position.

These principles are implemented by means of the following strategic objectives:

- To develop, manufacture, and sell high-quality products, which are reliable, environmentally compatible, and safe.
- To do business everywhere and at all times in compliance with the applicable rules and to deliver top results with our business partners in keeping with the highest ethical standards.
- To meet the requirements of our customers – those negotiated as well as those that can be reasonably expected – to their complete satisfaction.
- To constantly monitor and optimize the processes based on application-specific experience and recognized standards in order to achieve the highest customer benefits with simultaneous commercial viability.
- To ensure efficient implementation of statutory provisions, directives and standards, as well as the requirements for environment, health & safety (EHS).
- To ensure exemplary conduct on the part of management personnel, ensuring that their employees receive the information, support and training needed to achieve the objectives.

Strategy

Siemens Mobility’s management system ensures that the aforementioned strategic objectives are implemented through concrete measures in order to position Siemens Mobility at the top of the global market for the long term. We pay special attention to supporting the good health of our employees and preventing accidents.
The organizational chart depicts the structure of Siemens Mobility. Details are outlined in the various organizational charts and task flowcharts. The Quality Management department and the EHS Office of Siemens Mobility report directly to the management board.

### Responsibility

**Managing Board**

- Heads of the Business Units, process owners, managers, EHS officers of the Business Unit and sites

**Corporate offices:**
- Quality Management (CT TIM RSQ CQM)
- Technical Safety
- Environmental Protection, Health and Safety Management (HR EHS)

**Management Board**

- Heads of Quality Management, environmental protection officers, management officers, ECM coordinator, ECM managers, medical officers, occupational safety specialists

The heads of Quality Management within the Business Units and Business Segments are generally appointed by the heads of the respective organizational units. Their functions and duties are laid down in detail in job profiles and other regulatory documents. Each head of Quality Management is subordinated directly to the head of their organizational unit and is independent of the other organizational structures.

The appointment of the quality manager in the project (QMiP) as well as the EHSMiP (EHS Manager in the Project) follows a defined process.

EHS experts and officers in environment, health and safety are appointed by the responsible EHS manager in the Business Unit/location according to the laws and specific internal regulations. Their functions and duties are laid down in their letters of appointment.

The ECM coordinator and the ECM managers are appointed by the heads of the Business Unit. Their tasks are set forth in greater detail in job profiles and other regulations. They normally answer directly to the heads of their organizational unit and are independent of the other organizational structures.

### Technical authority

**Offices for Quality Management and EHS**

- The offices for Quality Management and EHS of Siemens Mobility define the regulatory framework. They have the necessary regulatory authority in this context. They perform informative, coordinating, advisory and supervisory functions in this respect and the same applies to all other quality offices, management representatives, environmental protection officers, occupational safety specialists, and other EHS experts and medical officers.

- All of the offices mentioned above support the process and product managers, but do not release them from their respective responsibility.
Product quality

This is how we ensure product quality …

Product requirements are determined, evaluated, and contractually stipulated in close contact with the customer. Development, project planning and project processing activities are all planned on this basis. Functional and technical solutions are derived from project specifications, e.g. planning documents or requirement specifications, and are laid down in specifications (e.g. performance specifications) for realization. The results are evaluated, verified, and validated. When products are purchased, released specifications and/or other technical documents are sent to qualified suppliers. The delivered products’ compliance with the purchasing requirements is ensured by means of predetermined inspections and testing or other appropriate measures.

At Siemens, manufacturing, assembly, installation, commissioning, and service activities are planned and performed under defined, reproducible conditions and include selective monitoring and measuring procedures. These are validated by means of state-of-the-art inspection and testing facilities, which are operated by specialists. The use of all necessary monitoring and measuring equipment is ensured – as is the use of appropriate calibration and tracking systems.

The procedure described above serves to systematically ensure product quality. Preventive measures, including monitoring and testing activities, are factored in throughout the entire value-added process, and are implemented and documented accordingly. Professionals with special qualifications in quality – called Quality Managers in Projects (QMiPs) – are employed in complex projects. The experience and expertise of the QMiPs is assured by means of special training schedules. Another example of the high priority attached to product quality by Siemens Mobility.

Occupational health and safety, environmental protection

Siemens begins assessing and considering the possible impact of our products and services on people and the environment right in the planning phase, applying international standards and taking into account local laws governing environmentally sound product design for the entire product lifecycle, including end of life.

… while adhering to all occupational safety and health and environmental protection standards.
Supplier management
We cultivate long-term relationships with trusted suppliers, who we think of as partners. They are assessed, evaluated, and promoted within the framework of a thorough selection and qualification procedure. The suppliers are generally involved in the development process from an early stage in order to produce innovative, high-quality products that incorporate the principles of EHS. Joint quality and safety standards are coordinated and specified in technical documents. The release and acceptance processes are defined on a product-specific basis.

Production and assembly
Production and assembly activities are planned meticulously, thoroughly documented in work and test plans, and specified for the various processes and operations. Validating inspections and tests, such as screening and system tests, are integrated into the reproducible process steps. Selective quality assurance measures accompany the entire production and assembly process. Particular care is exercised with respect to all components that affect safety and reliability. Agreed upon customer acceptance procedures are planned and carried out. EHS measures are actively promoted in the course of production and assembly.

Customer Services
Investments in new concepts should deliver a long-term and sustainable return. This calls for effective service strategies, which are essential if safety, system reliability, and availability are to be maximized over the system’s life cycle.

Our service portfolio guarantees the safe operational status of vehicles and components, and includes both proven maintenance strategies and efficient spare part solutions, through to digital services, testing and validation, training, and refurbishment. All our services can be structured to suit customer requirements, to ensure that our service meets their individual needs.

Test and Validation Center
Our various vehicle types – ranging from a standard to a meter gauge design and from an electric to a diesel powered trains – are tested extensively on our own track system. Our test center is expertly equipped to deal with all customer specific and country specific requirements. The track layout in our test center allows to test the train performance under “real-world” conditions. Comprehensive testing and preparation for technical approvals and validations guarantee that Siemens rail vehicles will operate safely. Our test and validation center is fully equipped with the most modern testing systems – from a measuring curve to a turn-tilt-table, acoustic measuring station and high-voltage testing station.
Controlling the management system

During the controlling process, partial objectives and measures are permanently oriented towards achieving the company’s overall targets. These targets are clearly defined and measurable, and they are agreed upon and updated periodically within the organizational units. Management personnel track, assess, improve and report on the degree to which these targets have been achieved.

Target discussions
Target discussions are conducted with Siemens Mobility within Siemens. These target discussions include such fundamental issues as quality and safety, as well as occupational health and safety and environmental protection. The agreements are implemented within the organizational units.

Self-assessments
Process owners measure and evaluate the performance of their processes for compliance with the agreed process objectives, then use benchmarking, lessons learned and best practices to implement a continuous process of improvement.

Management review
Management conducts regular reviews of the quality, safety and EHS management system in the organizational units. Management also reviews implementation based on a variety of factors, including audits, assessments, benchmarks, key figures, on-site inspections, self-assessments and reviews. Any improvement measures which may be necessary are subsequently derived from the results, implemented, and the effectiveness of these measures is reviewed.

Customer satisfaction
We gather customer-related information both actively and passively. This information is then evaluated and used to determine methods for boosting customer satisfaction.

Thanks to the interaction of all management instruments and targeted controlling, we have now established a continuous improvement process encompassing all levels of our company and wholly aimed at achieving BUSINESS EXCELLENCE.
Continual Improvement
Becoming best in class for quality and excellence has top priority.

At Siemens Mobility this means:
- Striving for constant improvement
- Creating transparency regarding nonconformities and opportunities for improvement
- Keeping on top of nonconformities and eliminating root causes in the long term
- Avoiding future nonconformities through a learning organization

These are clear goals, concrete measures and definite consequences activating an effective improvement system.

We use a six-step approach to improve our quality and safety, and our standard of EHS for the benefit of our customers and employees, and to strengthen our cost position.

We rely on the dedication of our managers and employees. We therefore encourage and make active use of their ideas, suggestions, and initiatives in an idea management system. All suggestions are evaluated and bonuses are paid if implemented.

Consequent Quality Management
Quality is an essential pillar of the Siemens brand and we have one quality vision: “Siemens Stands for World-Class Quality.” Quality Management is cross-functional and cross-organizational; therefore it focuses on the big picture and assesses the overall process with its interfaces. It helps to share knowledge within the organization, reduce complexity and ensure that today’s solutions are robust enough to meet the challenges of tomorrow.

Our quality strategy is based on the following seven fundamental principles:
1. Customer and business focus in all we do
2. Personal commitment to quality in everything we do
3. Check and test early to learn fast
4. Real time data and openness
5. Prevention, risk management, and systematic improvement
6. Quality competence for everybody
7. Quality manager valued as a business team member

Best Practice
Our aim is to be world class, and this is why we perform benchmarking and have adopted Best Practice Sharing as an element of our continuous improvement system.

Once the results are evaluated, appropriate improvement measures are decided upon and implemented. We assess our success by means of a selective implementation controlling system.

Siemens Leadership Framework
The Siemens Leadership Framework demonstrates our mutual understanding of excellent leadership and is binding for all executive personnel. It provides a clear-cut basis for the measurement and evaluation of management performance and provides a standardized approach for the evaluation of potential. It also offers a means of deriving binding measures for promotion and personnel development.

Outstanding employees and management personnel achieve outstanding results with the help of their excellent skills.
Documentation

Document management ensures that documents and data are checked, released, and/or put into force according to specific procedures. The same applies to the distribution, filing, archiving, amendment, and deletion of such documents and data, as well as their listing in directories according to their respective status. The specifications are generally structured on three levels:

- Siemens AG
  - The vision and values of Siemens AG define our corporate culture.
  - The Siemens Guidelines and Standards define the fundamental objectives, structure, and responsibilities of our company. They are the foundation for further developing and continuously improving the management systems.

- Siemens Mobility
  - This manual contains general statements about the division’s management system. It is supplemented by regulations that apply throughout Siemens Mobility which contain higher-level management system specifications and procedures.

- Business Units, Locations, Business Segments & Functional Departments, Sales Regions
  - The management system is defined in even greater detail in these units in order to ensure operational effectiveness. These regulations describe the individual processes and procedures, if necessary down to employee level.
Siemens Mobility

Integrated solutions for the efficient transport of people and goods

Business Unit Rolling Stock

- Rail vehicles for urban transport
- Rail vehicles for regional and long-distance transportation
- Passenger coaches
- Product and system solutions for passenger and freight transport

Business Unit Rail Infrastructure

- Products, solutions and complete systems for the automation, electrification and optimization of rail traffic
- Apps & backend systems for passenger information, booking, payment and management of data, infrastructure and fleets

Business Unit Customer Services

- Complete rail solutions integrating the entire portfolio

Business Unit Intelligent Traffic Systems

- Products and solutions for urban and interurban road traffic
- Traffic management systems for shared, connected and autonomous mobility

Business Unit Turnkey Projects

- Complete rail solutions integrating the entire portfolio