

THIS DOCUMENT IS UNCONTROLLED
 UNLESS IT IS PART OF A DCB/TOC
 OR IS VIEWED ON-LINE

APPROVED ENGINEERING CHANGE NOTICE (ECN) ON FILE IN
 D O C U M E N T C O N T R O L

TITLE: CORPORATE POLICY
 NATIONAL SEMICONDUCTOR QUALITY POLICY MANUAL

| REV | DATE/ECN NUMBER | ORIGINATOR | R E V I S I O N | H I S T O R Y |
|-----|-----------------|------------|--|--------------------------------------|
| BV | 09092112095 | Hanson | Update 3.0 | Update TS/ISO reference new revision |
| BW | 10092413115 | Hanson | Remove Arlington as a manufacturing site | Page 2 |
| BX | 11013113467 | Hanson | Update Foreword changed responsibility, References page 6 ISO9001:2008, section 11 Purchasing, section 23 Training, Appendix A deleted the following obsolete specs: (SC)MAS-2-100 & (SC)CSP-1-325 | |

FOREWORD

National Semiconductor, the industry's premier analog company, creates high performance analog devices and subsystems. National's leading-edge products include power management circuits, display drivers, audio and operational amplifiers, communication interface products and data conversion solutions. National's key markets include wireless handsets, displays, PCs and laptops. The company's analog products are also optimized for numerous applications in a variety of electronics markets, including medical, automotive, industrial, and test and measurement. With headquarters in Santa Clara, California, National has manufacturing facilities located in:

- South Portland, Maine
- Greenock, Scotland
- Melaka, Malaysia

This Quality Policy Manual defines the policies and procedures used at National Semiconductor to ensure that our products and services meet both the specified customer requirements and our business objectives in a consistent, economical and reliable manner.

This Manual is intended for use by all National Semiconductor employees as well as customers and other external bodies such as third party registrars.

The policies and procedures contained in this Manual are intended to establish and communicate the minimum requirements that all operating divisions of National Semiconductor must meet. These requirements are based on the requirements of our customers as well as applicable International and National Standards. As such, these requirements will be updated as the needs of our customers and the respective standards are changed as well as for continual improvement of the quality system.

Maintenance of this document is the responsibility of the Vice President of Worldwide Quality and Fab Foundry. All questions regarding this document should be directed to:

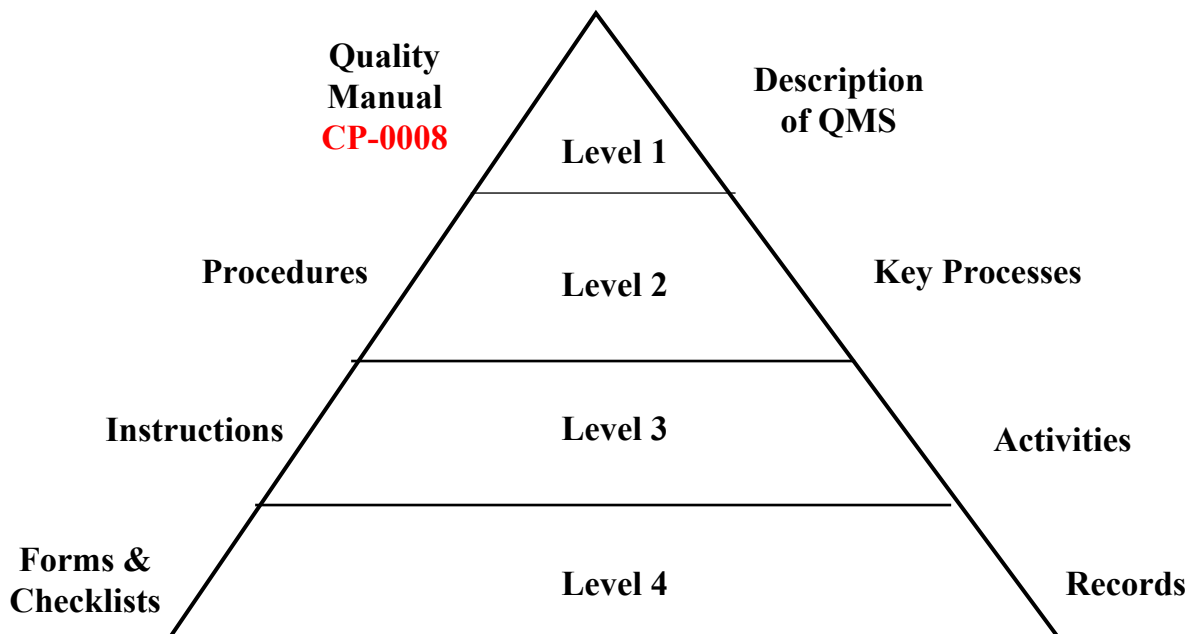
John L Conn
Vice President of Worldwide Quality
National Semiconductor Corporation
Santa Clara, California

INTRODUCTION

NATIONAL SEMICONDUCTOR QUALITY MANAGEMENT SYSTEM

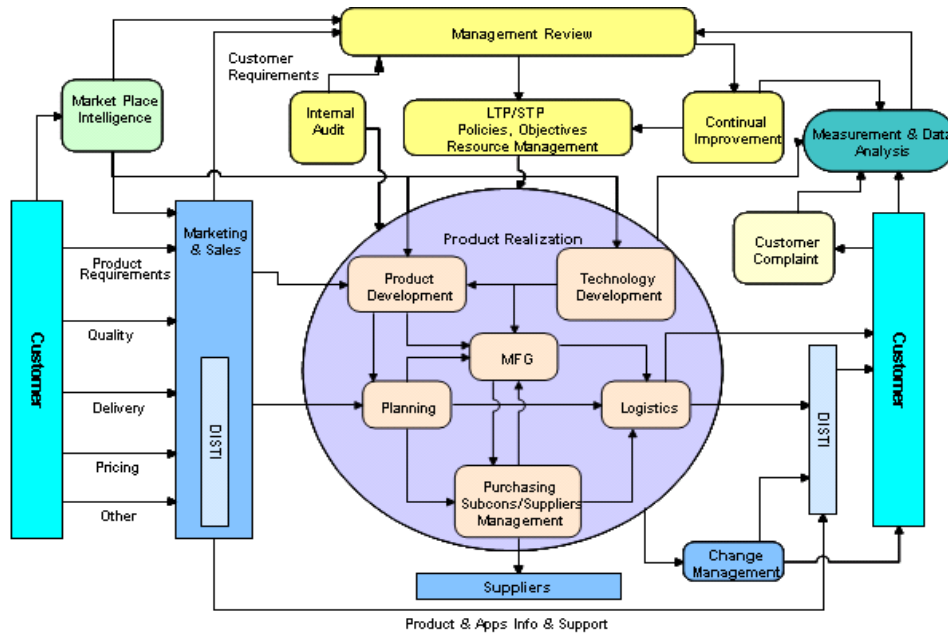
This documented quality policy manual defines the requirements and structure for the National Semiconductor Quality Management System (QMS). The QMS is compliant to the requirements of the ISO/TS 16949, Quality Management Systems Standard.

The quality policy manual defines corporate-level quality systems policies. The detail of how these policies are implemented is described in corporate, organizational, and process level procedures. The description of these key processes is further supported by work instructions, flow charts, and process maps. Evidence of the existence and operation of these key processes are provided by quality records. Below is a representation of this structure.



National Semiconductor has adopted the 'process approach' defined in the ISO/TS 16949, Quality Management Systems Standard, in implementing the quality management system. Process maps created at the corporate and organizational levels are utilized in understanding and communicating activities and responsibilities of the quality management system. Critical processes are interlinked and their interaction monitored and reviewed per the organizational objectives in support of the quality policy and ultimately to achieve and sustain customer satisfaction. The process maps are also utilized in the internal audit process to describe the scope of the assessment and to identify the critical processes.

Below is the process map created to describe the National Semiconductor corporate quality management system.



Support processes include: Document Control, Records Management, Training, HR, EHS and Facilities.

National Semiconductor executive management leads the implementation and operation of the quality management system through the utilization of the management review process. Information from customers and the marketplace is used by executive management during the business planning and resource allocation process to set performance objectives and performance measurements for each organization. Executive management periodically reviews these plans for continuing suitability.

The National Semiconductor business planning process utilizes the Long Term Plan (LTP), which is a three to five year look ahead plan, and a Short Term Plan (STP), which is the annual operating plan. The process is kicked off each year by the CEO who provides the direction for the corporation through a success model and imperatives. Resource and funding decisions set the framework. Successive levels of management then set goals and objectives for their organizations. The process is iterative with the operating units presenting their plans to management. The plans are shared with other organizations for feedback and alignment. There is a mid-year review. The LTP is updated annually.

Customer requirements, both internal and external, are utilized as input to the planning process. This information is composed of both customer specific direction and market place standards. The sources of this information include customer provided part drawings and general requirements drawings, performance feedback (customer scorecards, quality returns, etc), customer meetings, marketplace research, etc., which are received throughout the year.

All documents of external customer origin, customer detail and general drawings, received by National are submitted to the Customer Specification Quality Group (CSQG) for a drawing review. Records of drawing reviews are maintained in the Customer Specification database. Key members of affected organizations review the document. Any requirements not supported by existing National processes are identified.

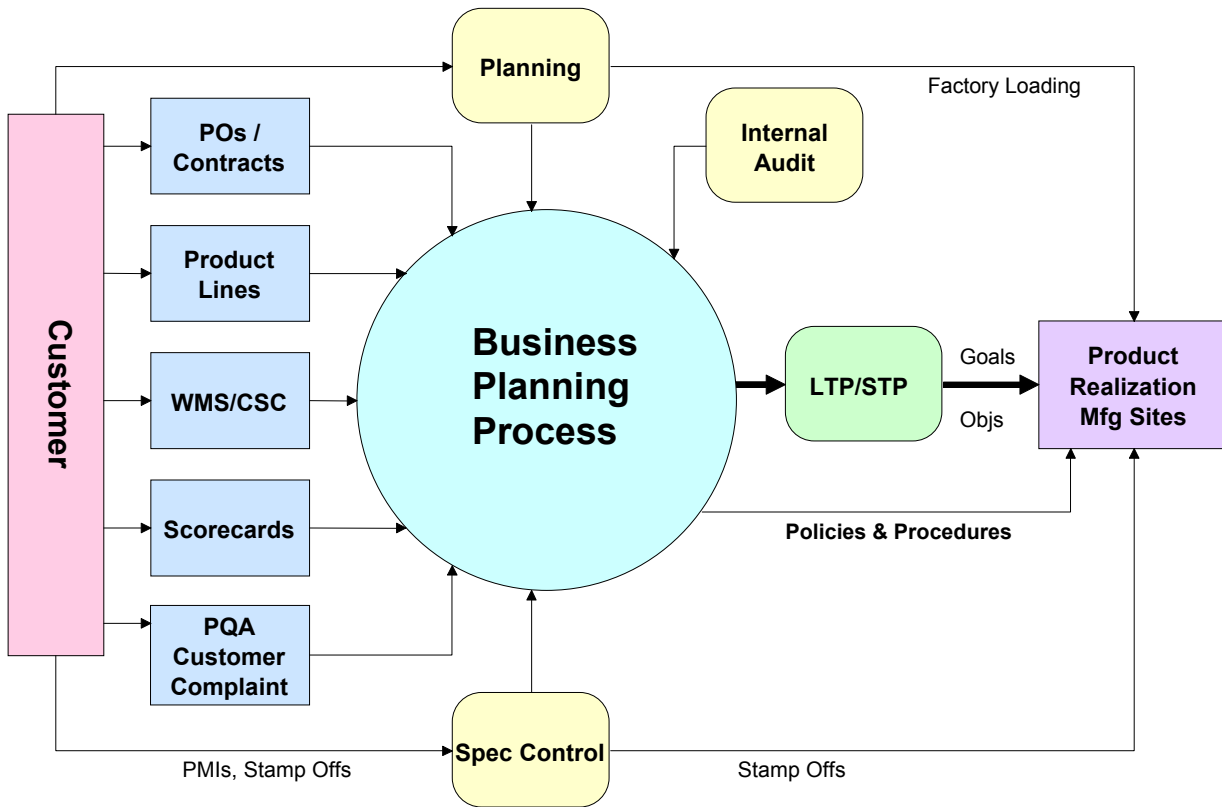
Those requirements that are unacceptable to National are identified in a waiver request report which is sent to the customer. Records of acceptance of waivers are attached to the drawing review. National performs due diligence in getting customer response to the waiver requests but in the absence of any response will consider the requested exceptions to be in force.

All acceptable Product, Quality, and Business requirements are comprehended and translated into National Semiconductor policies and procedures by the organizations responsible for the affected process(es). Where necessary, requirements that cannot be addressed by standard National processes are incorporated into special flows called stamp-offs.

This information is also utilized in organizational goals and objectives which are documented in the Short Term Plan (STP). Measurements are put in place to ensure compliance to these requirements. Feedback from our customers on our performance to

their expectations is also received and presented to management and applicable operating units as a measure of customer satisfaction. The measurement of the performance of the organization against those goals and objectives which satisfy customer requirements is also a measure of customer satisfaction.

Below is a process map describing the process for acquiring information about and implementing customer requirements.



1. **PURPOSE**

This document describes the policies and requirements of National Semiconductor's quality management system and represents the top tier document.

2. **SCOPE**

This document applies to all National Semiconductor sites and business entities.

3. **REFERENCES**

ISO/TS 16949:2009 Quality Management Systems

ISO 9001:2008 Quality Management Systems -

4. **QUALITY SYSTEM DOCUMENTATION**

This Quality Policy Manual (Tier 1 document) is written to meet the requirements of our customers as well as applicable International and National Standards. It is supported by documented procedures, work instructions, and process flows that define specific activities needed to implement the quality management system and the quality policy. This documentation describes the interaction between the processes of the quality management system.

Appendix A lists the corporate procedures (Tier 2 documents) defining minimum standards supporting key elements of the quality management system. Individual National Semiconductor manufacturing sites must create and maintain an addendum to this quality policy manual that describes how the quality management system is implemented at the site. This addendum identifies those site/organizational procedures (Tier 3 documents) created to support the corporate procedures listed in Appendix A, as well as those quality management system requirements described in this manual and not covered by a specific corporate procedure.

All National Semiconductor procedures and work instructions are titled and contain a unique identification number and revision status. All documents should have a reference section to identify those documents that establish process requirements and that support the described process in the given document.

Appendix B contains a cross reference of the ISO/TS 16949 clauses to specific sections of this document.

5. **QUALITY POLICY**

The National Semiconductor Quality Policy is to continually improve our processes, products and services to deliver solutions of the highest value, thereby providing a competitive advantage to our customers.

While striving for Zero Defects, National Semiconductor will incorporate customer requirements, promoting quality improvement and customer satisfaction at all times.

6. **MANAGEMENT RESPONSIBILITIES**

Senior Management has the responsibility and authority for supporting development and implementation of the Quality Management System, for ensuring that it remains relevant to the company's objectives and the needs and expectations of National's customers, and that it fosters a continual improvement environment.

Senior Management and their direct reports are responsible for communicating the Quality Policy and the importance of meeting customer as well as statutory and regulatory requirements to employees within their respective organizations.

They shall ensure that it is understood and applied to the daily work of the organization through the establishment of goals and quality objectives.

Senior Management is responsible for ensuring that the Quality Policy is appropriate for the goals of the corporation, that it promotes the continuing improvement of the effectiveness of the quality management system and that it is reviewed for continuing suitability.

All managers are responsible for communication of business plans and organizational goals within their respective organizations and reporting back to the organization on the performance and effectiveness of the quality management system. A process shall be in place to motivate employees to achieve the quality objectives and pursue continual improvement.

Where appropriate, management representatives have been designated to facilitate implementation of the quality management system, represent the needs of our customers in addressing their requirements as well as the requirements of applicable International and National Standards, and to assess and report on the performance of the quality management system.

Using input from assessments, as well as other quality and business performance data, management and/or their direct reports conduct periodic reviews to ensure that the quality management system has been effectively implemented, that it continues to support the Quality Policy of National Semiconductor, and that it meets the needs of our customers and the requirements of the standards on which the quality management system is based. Records are maintained to demonstrate conformance to these requirements.

The Vice-President of Quality and Reliability is identified as the management representative for senior management and is responsible and has authority for reviewing all decisions pertaining to the quality and reliability of National Semiconductor processes and products.

Note: "Senior Management", as defined herein, refers to the President & COO and his direct reports. "Management" refers to responsible managers and their staffs within each organization.

7. **ORGANIZATION**

In order to efficiently and effectively perform their jobs, employees must have a clear understanding of their roles and responsibilities within their organization and the existing documented quality management system and how their efforts contribute to the achievement of the goals and quality objectives.

The responsibility and authority of personnel who manage, perform, and verify work affecting quality and/or represent the needs of the customer in internal functions must be clearly defined. In particular, production operations must identify personnel who have responsibility for ensuring product quality. Management is responsible for ensuring this information is provided to employees and this is accomplished via the following methods:

- Organization charts, maintained at the corporate, group, manufacturing site, and product line level, that show the relationship of the organization to the corporate management structure and the relationship of the various functions within the organization to each other
- Job descriptions that define each employee's general job requirements
- Annual goal setting, including quality objectives, to define specific tasks and responsibilities at relevant functions and levels within the organization
- Work procedures and/or process specifications that define work processes and employee responsibilities

Records are maintained to demonstrate conformance to these requirements.

8. **BUSINESS PLANNING**

Business planning is accomplished through the annual Business Planning process. This process includes the Long Term Plan (LTP) and the Short Term Plan (STP). These plans typically include product, process, and manufacturing roadmaps

and performance plans, contingency plans, quality and continual improvement objectives, information on customer requirements and financial plans.

Management also has the responsibility and authority for ensuring that the critical processes for each organization have sufficient resources available to enable National Semiconductor to achieve its business and quality objectives and enhance customer satisfaction by including, as part of the STP, capital resource plans as well as plans for acquisition and training of human resources.

The results of the Business Planning process are documented and the Business Plan is a controlled document. Plans are reviewed and updated at least annually to reflect changes in business conditions and market needs and to reflect management's requirement for continual improvement in the processes affected by the plans.

9. MANAGEMENT REVIEW

Management review is a process/tool that is used to promote continual improvement. Management conducts periodic reviews of the effectiveness of the entire Quality Management System and changes that could affect the quality management system. These reviews include monitoring trends in operational, business and quality performance of the product realization processes and the associated support processes.

Metrics are defined for key performance areas and are used to monitor ongoing progress to quality objectives, to identify critical issues, to track improvement activities, to measure cost of poor quality, and to identify and prioritize opportunities for quality and productivity improvements. Organizational resources are analyzed against quality objectives for suitability. Data and information from all sources of product and process problems, including analysis of field failures, is also reviewed to identify areas where action may need to be taken to reduce or eliminate non-conforming product and to prevent potential problems from occurring.

The goals and objectives of the organization are analyzed to ensure that they align with known customer requirements information. Customer satisfaction measures, such as customer surveys and customer scorecards, are used to ensure that improvements in internal performance measurements of the product realization process are resulting in increased customer satisfaction and that the results are relevant, and accurate for drawing conclusions.

Results of internal assessment and the status of corrective and preventative actions are reviewed, including results of follow-up actions from previous management reviews. Competitive comparisons and/or benchmarks are used, when appropriate, to drive improvement activities. Records of these reviews are maintained.

10. REVIEW OF CUSTOMER REQUIREMENTS

Customer engineering specifications/standards and other documents of external origin received by National Semiconductor, are distributed, reviewed, and where necessary, implemented in a timely manner. National reviews customer requirements prior to accepting orders and prior to accepting changes to existing orders. This process includes, as appropriate:

- determination that the customer's requirements are clearly defined
- an assessment of National's ability to meet the customer's needs
- decisions regarding price and delivery
- negotiation and agreement with the customer on requirements, pricing, and delivery
- modification of standard product flows and creation of special flows (stamp-offs) to meet customer requirements
- assessment and provisions for confidentiality

Records are maintained to demonstrate conformance to these requirements.

11. PURCHASING AND SUPPLIER MANAGEMENT

Note: In the following paragraph, the term ‘supplier’ is used to denote both suppliers and subcontractors with full knowledge that the requirements for each may not always be exactly the same.

The quality of National’s products is dependent on the quality of purchased materials and services. The purchase process is documented and structured to meet the following requirements:

- ensure that purchasing documents clearly describe the product ordered
- ensure that purchased products conform to purchase requirements
- communicate to suppliers the appropriate product, quality, and delivery requirements
- ensure that purchased materials and services used meet government, safety, and environmental regulations
- ensure that finished product, direct & packing materials meet the provisions of regulatory and customer requirements

All National groups/organizations utilizing purchased materials and services are responsible for ensuring that they have a supplier management process in place. The supplier management process is structured to:

- identify and select suppliers with the capability to meet National’s needs
- establish criteria for selection, evaluation, qualification, and certification of suppliers
- perform supplier quality management system development
- ensure continuity of supply
- ensure that critical materials and services are purchased only from qualified sources
- ensure that only accredited external laboratories are used
- monitor and provide feedback on supplier performance
- monitor product quality and delivery performance (including use of premium freight)

National’s suppliers are required as a minimum to be certified to ISO 9001 2008 Quality Standard. External calibration laboratories are required to be certified to ISO 17025. An internal audit process is a requirement of the quality management system.

Suppliers are expected to maintain 100% on-time delivery performance. National verifies the quality of some materials and services by inspection of incoming material, review of supplier provided data, verification at the supplier’s premises, or receipt of successful ^d/3rd party assessment. The level of control applied is dependent on the effect the purchased material has on the product realization process. When suppliers have demonstrated their ability to provide the level of quality required by National, inspection and/or data review may be reduced or eliminated. Records are maintained of the evaluation and qualification of suppliers.

Occasionally, customers may ask to verify product at one of National’s supplier sites. When such a request is made, the requirement is communicated to the supplier and necessary arrangements are made. However, even when a customer performs such an inspection, National is still responsible for the quality of all products delivered by that supplier to the customer.

Records are maintained to demonstrate conformance to these requirements.

12. QUALITY PLANNING

Each National Semiconductor organization has the responsibility for defining how the requirements for quality will be met. Quality Planning is an integral part of National’s key business processes, and is used in business planning, product and process development, process management, acquisition of process equipment, and in the design and construction of new facilities. Each organization will provide and maintain the infrastructure necessary to achieve conformity to product requirements. Quality planning activities may include, as applicable:

- identification of customer specific requirements
- identification of critical product or process characteristics

- preparation of control plans and associated process monitors
- identification and acquisition of resources
- control of critical manufacturing materials to preclude unintended use
- definition and management of key organizational interfaces
- verification of the compatibility of new designs with process and test capabilities
- development of new inspection and test capabilities
- development of statistical tools and techniques
- definition of acceptance criteria for key critical product or process characteristics
- consideration of product safety during the design process
- the identification and preparation of quality records
- preparation of contingency plans to protect the customer supply of product
- application of preventative and predictive maintenance
- preparation of an Environment Health & Safety Policy
- monitoring of the work environment
- maintenance of the cleanliness and organization in the production areas
- verification of the absence of banned substances
- identification of sources for feedback on the performance of critical processes

Methods such as Failure Mode and Effects Analysis (FMEA), feasibility reviews, or other risk assessment techniques are used to identify potential risks. FMEA's and the Risk Analysis process will be compliant with the AIAG FMEA manual and customer requirements as applicable. Preventive actions needed to address critical risks are included as part of product and process development plans, are integrated into manufacturing process control systems, or into plant layout and construction plans.

13. PRODUCT DEVELOPMENT

All new product development at National uses The New Product Phase Review System (NPPRS). See Appendix A. The phase review system for each group is defined in controlled documented departmental procedures. A formal project review and approval, by responsible management, is completed and documented at critical points in the development process. The process is designed to manage organizational interfaces and communication between groups involved in the development process.

The process begins with an evaluation of customer or market needs. When a new product opportunity is identified, the customer or market requirements are determined, unclear requirements are clarified, the specific product characteristics are defined and documented, and the manufacturing feasibility is confirmed. Information from previous projects and other sources of input are reviewed. Where applicable, a process for communicating with the customer regarding product and contract requirements, identification of special characteristics, and providing customer feedback is established.

The review of product requirements includes the device packaging, specifically, if the device will use an existing package or will require development of a new package. Package development utilizes a similar phase review approach as product development with similar validation activities and works closely with the device development teams to meet performance and timing requirements.

A plan, which is updated as the product status changes, is then generated detailing the contract or order requirements, the product and customer requirements, the required resources, the development activities, the responsible function for each activity, and the timeline for the project. Management is responsible for ensuring that the resources necessary for completion of the project are available.

Since many functions contribute to a development project, cross-functional teams integrating the appropriate skills are used during the development process. The development team meets periodically to facilitate the sharing and coordination of project activities, which are detailed by phase in the NPPRS procedures. Each of the specified phase tasks are to be completed or accounted for before proceeding on to the next phase.

Key product characteristics are verified during development to ensure that they meet defined requirements and are reviewed at the team meetings or at the formal reviews. Design simulations are performed against the fabrication process design rules before initial manufacturing. A risk analysis is done against the product design. Initial silicon is characterized and verified against the product requirements. A final validation of the product occurs prior to formal product release and the results documented. The validation process and acceptance criteria may be product, market, and/or customer specific and is defined in the product development plan.

All new products must pass reliability qualification. The qualification plan is part of the product development plan. Prior to release to manufacturing, new products must meet manufacturing requirements identified in the NPPRS. See Appendix A. Where applicable, a customer approved product approval process is used to release the product to the customer. Records are kept to demonstrate successful completion of the development activities. See (SC)CSP-5-251 for specific record retention requirements.

Design failures are documented and procedures for corrective and preventive action followed in addressing such failures. The development process itself is periodically reviewed and learnings are fed back into the process.

14. **MANUFACTURING PROCESS DEVELOPMENT**

National also develops manufacturing processes to support its product needs. The input to process development includes an evaluation of future product and technology requirements. When a new process is targeted for development, a documented phase review process similar to that for product development is used including cross-functional teams, project plans, formal reviews at critical stages, as well as verification and validation of the process prior to release. Tools such as mistake proofing, process FMEAs and preliminary process capability studies may be utilized during this process, where appropriate. Records are kept to demonstrate successful completion of the development activities. See (SC)CSP-5-251 for specific record retention requirements.

15. **CHANGE MANAGEMENT**

After formal product/process release, continual improvement strategies are emphasized, and as a result, there may be a need to modify, update, or discontinue the product/process. When this occurs, the change management system is used to plan, qualify, and implement the change. Where practical, analysis is performed on potential impact to the systems in which the product/process is used and the effect of changes on product already delivered.

A formal documented change process is used to ensure that the appropriate validations are completed and modifications documented prior to implementing the change. When a product/process change requires the approval of a customer, a formal product change notification process is used. Records are kept indicating the initiation of any change to production processes and to demonstrate conformance to these requirements.

16. **PROCESS MANAGEMENT**

All critical manufacturing, development and business processes are carried out under controlled conditions, which includes, appropriate documentation of the process and product, use of suitable equipment, the availability and use of monitoring and measuring equipment, use of production scheduling and work flow tracking processes, and the implementation of process release activities. Key process equipment is identified and maintained.

All critical manufacturing, development and business processes are defined in controlled specifications, work instructions, and process flows which detail the specific procedures to be used for each process. The group that owns the process is responsible for determining the level of documentation necessary for control of the process. Factors such as size of the organization, complexity of the process, and competence of the personnel should be considered in this decision.

The process owners are responsible for ensuring that the documentation is current, that it is accessible at point of use, that it accurately reflects the process requirements, and that the processes are effectively implemented. Group management is responsible for ensuring that their employees are knowledgeable of and compliant to those specifications that describe their work processes and that those processes meet all quality management system requirements described in this manual and any associated addendum.

Specifications include as appropriate:

- outline of key process steps
- requirements for incoming inspection of supplied materials
- equipment operating procedures
- verification of manufacturing process set-ups
- management of production tooling
- process and product monitoring procedures including use of control plans and statistical techniques
- process, equipment, and personnel qualifications
- criteria for product workmanship
- preventive and predictive maintenance procedures
- record keeping requirements
- cleanroom controls
- corrective action procedures
- problem solving methodology for customer complaints/returns
- environmental, health and safety procedures
- product safety considerations
- requirements for handling, storage, packaging, preservation and delivery of products, including during development
- requirements for protection of product from deterioration caused by ESD
- inventory management controls including product tracking and FIFO processes

17. **INSPECTION, MEASUREMENT, & TEST**

There are a variety of inspection and test points defined within each process to verify that the process is in control, that product, process and customer requirements are being met, and to provide feedback for continual improvement. Inspections of final packaged products (product audits) are also conducted. Results of inspections are documented.

When failures occur they are addressed according to specific procedures defined in each work area (see Corrective Action). If product is impacted by the failure, it is considered to be non-conforming and is identified, documented, segregated, reviewed, and dispositioned according to work area procedures. Emphasis is placed on creating procedures to prevent mixing of production materials.

When inspection, measuring, and test equipment, test hardware, or test software is used in the process, a measurement capability analysis is done. The equipment and software is initially verified and then maintained and calibrated, where applicable, to ensure that it is capable of providing consistent, accurate measurements. Appropriate statistical studies (e.g., MSA) are utilized for analysis of measurements of critical characteristics or those that are part of the control plan. Where customer review of the methods and data is required, it is made available.

Any internal laboratories utilized in supporting or facilitating inspection, measurement, and test activities, have documented laboratory scope statements describing the specific tests, evaluations, and calibrations it is qualified to perform and the methods and standards utilized, and any special requirements of personnel and equipment. All laboratory facilities (production, engineering development, test and measurement, etc) must meet corporate requirements for compliance with ESD standards (see (SC) CSI-3-038).

18. PRODUCT IDENTIFICATION AND TRACEABILITY

Product is identified from raw materials through all stages of production and shipment to the customer. The tracking procedure includes:

- assignment of a unique identifier to each lot or batch of material
- recording of the completion of each process step and the inspection and test status
- recording of pass/fail quantities
- identification of key process information as defined in work instructions
- recording of key process parametric data as defined in work instructions
- traceability to key raw materials and the production process as needed

19. CORRECTIVE AND PREVENTIVE ACTION

When problems occur in the process, product, quality management system, or when customer complaints or returns are received, employees take immediate and appropriate corrective action according to procedures defined in their work area. A process is defined and documented to promptly inform those managers with responsibility and authority for corrective action when products or processes become noncompliant with specified requirements. Corrective action includes:

- Documenting the problem
- Where product is involved, preventing any additional defective product from being produced, and preventing any defective product from being shipped to a customer
- Investigating the root cause of the problem and recording the results of the investigation
- Utilizing problem solving and error proofing methods to define corrective actions
- Defining, documenting, and implementing the appropriate corrective actions
- Verifying that the corrective action is effective in eliminating the problem and preventing its recurrence
- Promptly inform management of any issues that they are unable to resolve

Additionally, data and information from all sources of product and process problems is periodically analyzed to identify areas where action may be needed to prevent potential problems from occurring. Appropriate actions are taken to initiate preventive actions and to ensure they are effective. Corrective and preventive actions are included in the management review process.

Records are maintained to demonstrate conformance to these requirements.

20. DOCUMENT AND DATA CONTROL

Document Control is accomplished by systems that directly affect work or process instructions and methods for their delivery to the workplace. Work processes generate critical data that is used to control subsequent processing. Data Control is characterized by systems that must have high availability, responsiveness, and accuracy, and directly affect our ability to develop and deliver product and maintain the Quality Management System.

All critical work processes have documented procedures, work instructions, and data associated with them. A formal documented process is in place to create/update, approve, and issue all critical process documents and data so that only the latest, approved versions are used. The change process includes procedures for identifying the changes being made and for providing the necessary background information to approvers of document and data changes. Systems are in place to ensure that the most current version of appropriate documents and data are available to employees who need them at their points of use. Documents which are obsolete are identified to prevent their unintended use.

21. QUALITY RECORDS

Records are maintained to document effective implementation of the quality management system and provide evidence of conformity to requirements. Data and other information generated as the result of work processes are considered to be quality records. Work area procedures define the type of records needed, location and manner of collection, retention times (see (SC)CSP-5-251 for specific retention requirements), retention responsibility, storage media, and disposal requirements. Records are stored under appropriate security and environmental control to ensure they remain legible and are accessible as needed to validate conformance to work procedures. The control of records shall meet regulatory and customer requirements.

22. ASSESSMENTS

Periodic internal quality management system assessments are required of all National groups/organizations to ensure compliance to stated requirements, the effective implementation and operation of the quality management system, and the identification of opportunities for continual improvement. Assessments are scheduled according to system performance and the criticality of the processes and are performed by qualified personnel independent of the area being assessed. Assessment frequency is established per the requirements of (SC) QAI-3-01. A process is in place to train and certify internal assessors. Results of assessments are documented, root cause analysis is conducted using the 5 Why methodology and corrective actions are verified to ensure they are effectively implemented. Assessment results form part of the management review.

23. TRAINING

Employees are hired based on their ability to perform the work defined in their job descriptions. Competence at hire is determined by the employee's education, training, skills and experience. Additional training may be provided for employees to sustain and further develop the skill set in performing work effecting product quality and customer satisfaction. Such training may be defined and measured in their individual development plan and/or goals.

24. STATISTICAL TECHNIQUES

Use of statistical tools is a key to continual improvement of processes, products, and services. Training in statistical methods is provided as needed to employees. The specific statistical techniques to be used and how they are to be used are defined in work area instructions, as appropriate.

APPENDIX A

| QUALITY SYSTEM ELEMENT | DOCUMENT NUMBER | DOCUMENT TITLE |
|---|---|---|
| 7. ORGANIZATION | (SC)CSP-8-001 | Authority and Control of Global Job Classification Program |
| 9. MANAGEMENT REVIEW | (SC)CSP-1-471 | Management Review of National Semiconductor Quality System |
| 10. REVIEW OF CUSTOMER REQUIREMENTS | (SC)GPS-0002-SPCT (SC)SOP-1-372 (SC)CSP-9-111C2 | Customer Drawing Review/Stamp-off Procedure for Commercial Integrated Circuits Corporate Contracts Administration Customer Product Stewardship |
| 11. PURCHASING AND SUPPLIER MANAGEMENT | ((SC)CSI-3-135 (SC)QAI-3-055 (SC)MAS-3-055 (SC)CSP-5-253 | Subcontractor Selection & Management Procedure Subcontractor Quality Systems Assessment Hi-Rel Subcontractor Quality Systems Assessment Supplier Quality Management Policy |
| 12. QUALITY PLANNING | (SC)CSI-14-002 (SC)CSP-9-106A-Standard (SC)CSP-9-111A-Standard (SC)CSP-9-111C2 (SC)CSP-5-005 (SC)FIN100-03 | The New Product Phase Review System EHS Management Systems Product Stewardship Standard National Semiconductor's Product Stewardship Guide for Customers New Product Development FMEA and Risk Analysis Process for NSC Crisis Management |
| 13. PRODUCT DEVELOPMENT | (SC)CSI-14-002 (SC)CSP-5-252 (SC)CSP-5-005 | The New Product Phase Review System Corporate New Product Reliability Qualification Requirements New Product Development FMEA and Risk Analysis Process for NSC |
| 14. PROCESS DEVELOPMENT | (SC)CSI-14-003 (SC)CSP-14-004 (SC)SOI-18-001 (SC)CSP-5-001 | Transfer Phase Review System Advanced Process Technology Development New Technology Phase Review System (NTPRS) for Package Development FMEA and Control Plan Implementation for NSC |
| 15. CHANGE MANAGEMENT | (SC)CSP-1-014 (SC)CSI-11-002 (SC)CSP-14-006 (SC)CSP-5-032 (SC)CSP-5-052 | Change Management & Customer Notification System Product Discontinuance Quality Review Boards for New Wafer Fab Process Reliability Requirements for Wafer Fab Processes, Changes, and Transfers Reliability Requirements for Assembly Process Changes/Transfers |
| 16. PROCESS MANAGEMENT | (SC)CSP-5-272 (SC)CSP-1-122 (SC)CSI-3-038 (SC)CSP-9-101A-Standard (SC)CP4.01 | Applicable Process Flowcharts Discrepant Materials Review, Corrective Action Process & Problem Prevention Review Statistical Application and SPC Implementation Electrostatic Discharge (ESD) Control Requirements EHS Management Systems Standard Environmental, Health and Safety |
| 17. INSPECTION, MEASUREMENT AND TEST | (SC)CSP-1-122 (SC)CS-1000-G (SC)CSP-2-152 (SC)CSI-3-038 (SC)GPS-6223-LOGISTIC (SC)CSP-5-064 (SC)CSP-1-016 (SC)CSP-5-272 (SC)CSP-1-019 | Statistical Application and SPC Implementation Calibration System for Measuring & Test Equipment Facilities and Environmental Requirements for Assembly and Electrical Test Area Electrostatic Discharge (ESD) Control Requirements Finished Goods Shipping Specification Ship Hold and Release Product Ship and New Product Release Waiver Procedure Discrepant Materials Review, Corrective Action Process & Problem Prevention Review Wafer Sort/Final Test Clip Limit/Statistical Bin Limit Procedure |
| 18. PRODUCT IDENTIFICATION & TRACEABILITY | (SC)CSI-1-109 (SC)CSI-1-366 (SC)CSI-1-004 (SC)CSI-1-473 | Corporate Lot Numbering System Die Run/Lot Traceability System Buildsheet System Nomenclature Standards for Levels 50, 55 & 95 IDs |
| 19. CORRECTIVE AND PREVENTIVE ACTION | (SC)CSP-5-272 (SC)CSI-5-23 (SC)CSP-3-001 | Discrepant Materials Review, Corrective Action Process & Problem Prevention Review Product Quality Assurance (PQA) Customer Reject Analysis Product Information Advisory (PIA) Process |
| 20. DOCUMENT/ DATA CONTROL | (SC)SOP-1-001 | Worldwide Specification System |
| 21. QUALITY RECORDS | (SC)CSP-1-340-WW (SC)CSP-5-251 (SC)CSP-1-340-Retain | Worldwide Records Management Policy Worldwide Corporate Procedure for Retention of Manufacturing / Product Records Worldwide Record Retention Guide and Schedule |
| 22. ASSESSMENTS | (SC)QAI-3-01 | Quality Assessment |
| 23. TRAINING | (SC)CSP-8-013 (SC)CSP-9-106A-Standard (SC)SOI-1-014 (SC)SOI-1-501 | National Semiconductor Training and Certification Program EHS Training and Awareness NSU Course Management and Evaluation NSU Needs Assessment, Vendor/Course Setup Process |
| 24. STATISTICAL TECHNIQUES | (SC)CSP-1-122 | Statistical Application and SPC Implementation |

APPENDIX B

This appendix cross-references sections of CP-0008 with relevant clauses of the TS-16949 standard. For a complete cross-reference you should review this table in conjunction with the quality documentation in Appendix A and the documentation of individual National sites or business entities.

| TS 16949 Clause | Title | (SC)CP-0008 Section |
|------------------------|--|----------------------------|
| 4 | Quality management system | -- |
| 4.1 | General requirements | 4, 6, 16 |
| 4.1.1 | General requirements - Supplemental | 11 |
| 4.2 | Documentation requirements | -- |
| 4.2.1 | General | 4 |
| 4.2.2 | Quality manual | 4, Appendix A |
| 4.2.3 | Control of documents | 20 |
| 4.2.3.1 | Engineering specifications | 10 |
| 4.2.4 | Control of records | 21 |
| 4.2.4.1 | Records retention | 21 |
| 5 | Management responsibility | -- |
| 5.1 | Management commitment | 6 |
| 5.1.1 | Process efficiency | 9 |
| 5.2 | Customer focus | 6 |
| 5.3 | Quality policy | 5, 6 |
| 5.4 | Planning | -- |
| 5.4.1 | Quality Objectives | 6 |
| 5.4.1.1 | Quality Objectives - Supplemental | 6 |
| 5.4.2 | Quality management system planning | 6, 12 |
| 5.5 | Responsibility, authority and communication | -- |
| 5.5.1 | Responsibility and authority | 6,7 |
| 5.5.1.1 | Responsibility for quality | 6,7,19 |
| 5.5.2 | Management representative | 6 |
| 5.5.2.1 | Customer representative | 6,7 |
| 5.5.3 | Internal communication | 7 |
| 5.6 | Management review | -- |
| 5.6.1 | General | 9 |
| 5.6.1.1 | Quality management system performance | 9 |
| 5.6.2 | Review input | 9 |
| 5.6.2.1 | Review input – Supplemental | 9 |
| 5.6.3 | Review output | 9 |
| 6 | Resource management | -- |
| 6.1 | Provision of resources | 8 |
| 6.2 | Human resources | -- |
| 6.2.1 | General | 23 |
| 6.2.2 | Competence, awareness and training | 7, 23 |
| 6.2.2.1 | Product design skills | 23 |
| 6.2.2.2 | Training | 23 |
| 6.2.2.3 | Training on the job | 23 |
| 6.2.2.4 | Employee motivation and empowerment | 6, 7 |
| 6.3 | Infrastructure | 12 |
| 6.3.1 | Plant, facility and equipment planning | 12 |
| 6.3.2 | Contingency plans | 12 |
| 6.4 | Work environment | 12 |
| 6.4.1 | Personnel safety to achieve product quality | 12 |
| 6.4.2 | Cleanliness of premises | 12 |
| 7 | Product realization | -- |
| 7.1 | Planning of product realization | 13 |
| 7.1.1 | Planning of product realization - Supplemental | 12, 13 |
| 7.1.2 | Acceptance criteria | 12 |
| 7.1.3 | Confidentiality | 10 |

| TS 16949 Clause | Title | (SC)CP-0008 Section |
|-----------------|---|---------------------|
| 7.1.4 | Change control | 15 |
| 7.2 | Customer-related processes | -- |
| 7.2.1 | Determination of requirements related to the product | 13 |
| 7.2.1.1 | Customer-designated special characteristics | 13 |
| 7.2.2 | Review of requirements related to product | 10, 13 |
| 7.2.2.1 | Review of requirements related to product – Supplemental | 13 |
| 7.2.2.2 | Organization manufacturing feasibility | 13 |
| 7.2.3 | Customer communication | 10, 13 |
| 7.2.3.1 | Customer communication – Supplemental | 13 |
| 7.3 | Design and development | -- |
| 7.3.1 | Design and development planning | 12, 13 |
| 7.3.1.1 | Multidisciplinary approach | 12, 13 |
| 7.3.2 | Design and development inputs | 13 |
| 7.3.2.1 | Product design input | 13 |
| 7.3.2.2 | Manufacturing process design input | 13 |
| 7.3.2.3 | Special characteristics | 12, 13 |
| 7.3.3 | Design and development outputs | 13 |
| 7.3.3.1 | Product design outputs - Supplemental | 12, 13 |
| 7.3.3.2 | Manufacturing process design output | 12, 13 |
| 7.3.4 | Design and development review | 13 |
| 7.3.4.1 | Monitoring | 13 |
| 7.3.5 | Design and development verification | 13 |
| 7.3.6 | Design and development validation | 13 |
| 7.3.6.1 | Design and development validation - Supplemental | 12 |
| 7.3.6.2 | Prototype programme | 12, 13 |
| 7.3.6.3 | Product approval process | 13 |
| 7.3.7 | Control of design and development changes | 13, 15 |
| 7.4 | Purchasing | -- |
| 7.4.1 | Purchasing process | 11 |
| 7.4.1.1 | Regulatory conformity | 11 |
| 7.4.1.2 | Supplier quality management system development | 11 |
| 7.4.1.3 | Customer-approved sources | 11 |
| 7.4.2 | Purchasing information | 11 |
| 7.4.3 | Verification of purchased product | 11 |
| 7.4.3.1 | Incoming product quality | 11 |
| 7.4.3.2 | Supplier monitoring | 11 |
| 7.5 | Production and service provision | -- |
| 7.5.1 | Control of production and service provision | 16 |
| 7.5.1.1 | Control plan | 12, 16 |
| 7.5.1.2 | Work instructions | 16 |
| 7.5.1.3 | Verification of job set-ups | 16 |
| 7.5.1.4 | Preventive and predictive maintenance | 16 |
| 7.5.1.5 | Management of production tooling | 16 |
| 7.5.1.6 | Production scheduling | 16 |
| 7.5.1.7 | Feedback of information from service | 16 |
| 7.5.1.8 | Service agreement with customer | 16 |
| 7.5.2 | Validation of processes for production and service provision | 14, 16 |
| 7.5.2.1 | Validation of processes for production and service provision - Supp | 14, 16 |
| 7.5.3 | Identification and traceability | 18 |
| 7.5.3.1 | Identification and traceability - Supplemental | 18 |
| 7.5.4 | Customer property | 12, 16 |
| 7.5.4.1 | Customer-owned production tooling | 12, 16 |
| 7.5.5 | Preservation of product | 16 |
| 7.5.5.1 | Storage and inventory | 16 |
| 7.6 | Control of monitoring and measuring devices | 17 |
| 7.6.1 | Measurement system analysis | 17 |
| 7.6.2 | Calibration/verification records | 17 |
| 7.6.3 | Laboratory requirements | 17 |

| TS 16949 Clause | Title | (SC)CP-0008 Section |
|-----------------|---|---------------------|
| 7.6.3.1 | Internal laboratory | 17 |
| 7.6.3.2 | External laboratory | 11, 17 |
| 8 | Measurement, analysis and improvement | -- |
| 8.1 | General | 9 |
| 8.1.1 | Identification of statistical tools | 24 |
| 8.1.2 | Knowledge of basic statistical concepts | 24 |
| 8.2 | Monitoring and measurement | -- |
| 8.2.1 | Customer satisfaction | 9 |
| 8.2.1.1 | Customer satisfaction – Supplemental | 9 |
| 8.2.2 | Internal audit | 22 |
| 8.2.2.1 | Quality management system audit | 22 |
| 8.2.2.2 | Manufacturing process audit | 22 |
| 8.2.2.3 | Product audit | 22 |
| 8.2.2.4 | Internal audit plans | 22 |
| 8.2.2.5 | Internal auditor qualification | 22 |
| 8.2.3 | Monitoring and measurement of processes | 9, 16, 19 |
| 8.2.3.1 | Monitoring and measurement of manufacturing processes | 12, 15, 16 |
| 8.2.4 | Monitoring and measurement of product | 12, 13, 16 |
| 8.2.4.1 | Layout inspection and functional testing | 13, 16 |
| 8.2.4.2 | Appearance items | N/A |
| 8.3 | Control of nonconforming product | 17 |
| 8.3.1 | Control of nonconforming product - Supplemental | 17 |
| 8.3.2 | Control of reworked product | 17 |
| 8.3.3 | Customer information | 17 |
| 8.3.4 | Customer waiver | 15, 16, 17 |
| 8.4 | Analysis of data | 9 |
| 8.4.1 | Analysis and use of data | 9 |
| 8.5 | Improvement | -- |
| 8.5.1 | Continual improvement | 6, 9 |
| 8.5.1.1 | Continual improvement of the organization | 9 |
| 8.5.1.2 | Manufacturing process improvement | 9, 16 |
| 8.5.2 | Corrective action | 19 |
| 8.5.2.1 | Problem solving | 19 |
| 8.5.2.2 | Error-proofing | 19 |
| 8.5.2.3 | Corrective action impact | 19 |
| 8.5.2.4 | Rejected product test/analysis | 19 |
| 8.5.3 | Preventive action | 9, 19 |