

REVISION HISTORY

REV.	DCN#	REASON AND DESCRIPTION ON CHANGE	DCN ORIGINATOR	RELEASE DATE
24	15769	Sections changed include: 2.2, 3, 4, Figure 1, 4.2.3, 5.1, 5.4.1, 5.5.2, 6.3.2, 7.2.1.1, 7.3.2.3, 7.5.1.4, 7.5.1.5, 7.5.1.6, 7.5.1.7, 7.5.1.8, 7.5.2, 8.2.2.2, 8.2.2.3, 8.2.2.4 to better describe current practices in software development and manufacturing processes	Don Sabin	11/29/04
25	16023	<ul style="list-style-type: none"> ➤ Section 1.3 Inserted new revision of Xilinx Quality Policy. ➤ Section 4.1 and Appendix C. Removed Customer Specific requirements and placed them in QAP0163. ➤ Section 6.4.1 change ISO-14001 to ISO014001:2004 ➤ Section 7.5.1.1 Added text requiring supplier control plans and FMEAs to be maintained by suppliers and audited through Xilinx supplier management process ➤ Appendix A, added EMS0001, EMS0006; removed reference to EMS0012; EMS0024 becomes a global procedure. ➤ Appendix D renamed to Appendix C ➤ Removed Names from Org Charts 	Don Sabin	3/17/05
26	16256	<ul style="list-style-type: none"> • Updated Vision, Mission, • Replaced description of specific key programs with general description and link to Wim's Corner. • Updated key process map to show additional remote sites • Section 5.5.2.1: Added "The Quality leadership...are addressed" • Added ISO/TS16949 Semiconductor Commodity & QAP0136 (p.36) • Added AECQ100 and TS16949 Semiconductor commodity reference specs (p. 39) • Removed QAP0138 reference spec Added AEC- Q001/Q002 (p.41) 	Don Sabin	6/29/05
27	16503	<ul style="list-style-type: none"> • Section 3.0 – Added statement to the section to clarify our compliance to AS9003 • Section 5.3 – Added statement that the quality policy is reviewed for continued suitability during the annual strategy development process • Appendix A - Removed many duplicate and obsolete references among Xilinx specifications • Section 4.1: Put in a reference to Design Services • Section 4.2.3: Put in a reference to XDS0006 (Design Services Handbook) • Section 4.2.5: Entered Design Services into the table • Section 7.1: Entered XDS0006 against Development Process in the table • Page 48: Add Appendix D for Design Services 	Don Sabin Lionel Barker	10/26/05



TITLE:

Xilinx Quality Manual

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DOCUMENT/ DRAWING NUMBER

QAP0002

REV

27

Sheet 0 of 48

1. Company Vision, Mission, and Quality Policy

1.1. Vision

To put a programmable device in every piece of electronic equipment in the next 10 years and to build a company that sets a new standard for managing high tech companies.

1.2. Mission

Help our customers attain the fastest time-to-market and flexible product life cycle management through programmable technology solutions consisting of silicon, software, IP, support and Services

1.3. Quality Policy

Xilinx management established the following Quality Policy to communicate Xilinx's total commitment to quality. It reflects Xilinx's commitment towards meeting customer expectations through continual improvement of the QMS and focus on Quality Products, Quality Processes, and Quality People. This policy is reviewed for continuing suitability by senior management.

We, as employee owners of Xilinx, are empowered and committed to delivering a flawless customer experience. Everyone who works with us is also expected to ensure ownership for quality by putting the customer first in everything we do.

We will achieve this by:

- Promoting the 'Pursuit for Perfection' throughout our product development lifecycle: Quality Products
- Constantly raising our standards of execution: Quality Processes
 - Resolving customer issues quickly and effectively: Sense of urgency
 - Championing the formal process of continuous improvement and creative innovation
 - Focusing on prevention rather than reaction: Excellence versus mediocrity
 - Driving issues to root cause: Eliminating repeat problems
 - Striving for zero defects: Getting it right the first time
 - Building strong relationships in our supply chain and development processes
- Growing, developing and executing flawlessly by investing in our training and development: Quality People

As employee owners of Xilinx, we hold ourselves accountable. Doing so will make Xilinx a respected and process-focused 'Blue Chip' company.

2. Key Programs and Quality Objectives

Xilinx customers select our products for the following reasons:

- They are the most advanced in the industry
- They represent the most cost effective solution
- They have the best Quality and Reliability in the industry

2.1. Key Programs

Xilinx key programs have been defined by executive management and sponsored by the CEO. All employees can view a current listing of the key programs.

<http://web/wim/>

2.2. Objectives and Targets

Xilinx product roadmap is the primary element in setting quality objectives and targets. Metrics, owners, and targets are defined in the Management Review (QAP0133) procedure. Key objectives are established taking into account several factors relevant to the product roadmap. These factors include:

- Market requirements
- Customer requirements
- Technology
- Manufacturing
- Industry standards

2.3. Quality Leadership

Each year, functional groups define and communicate their strategies at the Xilinx Directors meeting. These strategies are then communicated, as appropriate, throughout the organization. Functional strategies are used to drive departmental, team and individual goals and objectives.

Additional quality planning activities commonly referred to as process, product, and quality improvement programs, may be initiated by various sources such as:

- Management review activities
- Cross-functional teams designed to address a particular goal/project
- Quality and Process Improvement Teams
- Online Project Management review meetings

3. Scope

Xilinx designs, develops and markets complete programmable solutions, including advanced integrated circuits, software design tools, predefined system functions delivered as intellectual property (IP) cores, field engineering and technical support. The programmable logic devices (PLDs) include field programmable gate arrays (FPGAs) and programmable logic devices (CPLDs). These devices are standard products that customers program to perform desired logic functions. The products are designed to provide integration and quick time-to-market for electronic equipment manufacturers in the communications, storage, server, consumer, industrial and other markets. Xilinx sells its products globally through independent domestic and foreign distributors, through direct sales to original equipment manufacturers (OEMs) by a network of independent sales representative firms and through a direct sales management organization.

This Quality Manual defines the Xilinx Quality Management System (QMS). The QMS, which is structured around ISO-9001: 2000, TL9000 for components category 8.1, TS16949, Military (QML) and industry standards ensures quality throughout all stages of design and manufacture of products and services. Xilinx is in conformance with the requirements of AS9003 through its certification to TL9001 and TS16949. Xilinx does not currently plan to seek certification to AS9003 though our internal quality systems do comply with this standard.

All elements within this quality manual apply to the IC Divisions of Xilinx. The elements from TL9000 and TS16949 do not apply to the Design Software and Development Systems. The scope of the TL9000 and the TS16949 certifications do not include the Design Software and Development Systems Organization.

4. Quality Management System (QMS)

4.1. General Requirements

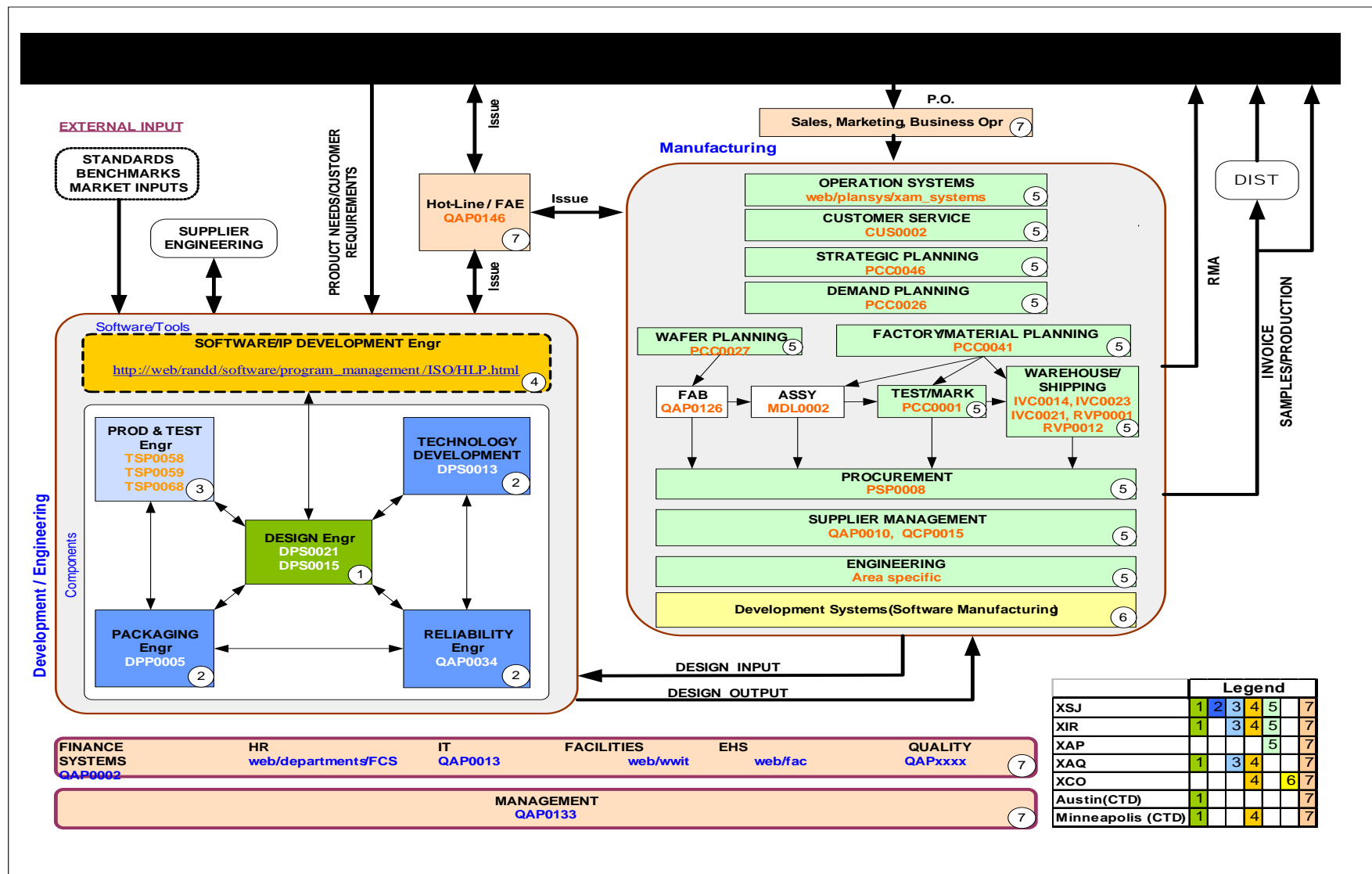
Xilinx has established, documented, implemented and maintains a QMS and continually improves its effectiveness in accordance with the requirements of ISO9001. Key processes are defined in a set of corporate procedures. Figure 1 shows the key processes, their sequence and interaction. These processes support the implementation of the QMS. Criteria and methods needed to ensure that both the operation and control of these processes are effective have been defined within this manual and the QMS procedures. Senior management ensures the availability of resources and information necessary to support the operation and monitoring of these processes. Senior management is responsible to monitor, measure, analyze and implement actions necessary to achieve planned results and continual improvement of these processes. Control of outsourced processes is defined within the QMS ensuring conformity to all requirements, including customer requirements. See QAP0163 - PR, CUSTOMER SPECIFIC QMS REQUIREMENTS for additional customer specific QMS requirements.



Quality Manual

Design Software Division, Development Systems and Online Store Operations; manage the development and manufacturing of all DSD products. Process maps are shown in Appendix B.

Design Services (XDS) is a division of Sales. It is responsible for working directly with Xilinx customers to deliver custom designs utilizing Xilinx Technology under contract. The XDS QMS is located under the designator XDS. The process map and entry points are detailed in appendix D.



Key Processes, Figure 1.

4.2. Documentation Requirements

4.2.1. General

The QMS documentation is detailed in this Quality Manual. The Quality Manual includes the quality policy and quality objectives. Documents needed to ensure effective planning, operation, and control of processes, are included in the QMS, including documents required by ISO9001. Records are maintained as required (QAP0059).

4.2.2. Quality Manual

This quality manual defines Xilinx QMS and the documented procedures necessary for its implementation, maintenance and improvement. (see Figure 2).

4.2.3. Control of Documents

Xilinx operates a comprehensive document and data control system to control QMS documentation and to ensure required approvals. The procedure, Formal Document Release and Change Control (DCC0003) defines the document and data control system requirements. Controls needed to approve documents prior to issue, review, update and re-approve documents, to ensure that changes and the current revision status of documents is identified, relevant versions of applicable documents are available at points of use, documents remain legible and readily identifiable, and documents of external origin are identified and their distribution controlled. Obsolete documents are identified and controlled to prevent unintended use. Documents required for the operation of the QMS are managed by the Document Control function within the Quality Systems organization, and are available online at the internal Document Control home page <http://web/dochome/>. External documents such as military documents, industry standards, and handbooks required for the operation of the QMS are available within Document Control (DCC0001).

Design Software Division operates under a series of document controlled development policies and procedures, which cover all the workflow within the group. These procedures are maintained within the XCS system http://web/randd/software/program_management/ISO/. Procedures are regularly reviewed and updated to improve performance, ensure compliance with customer quality requirements, and remain current with corporate practices and policies.

Design Services operates under a series of document controlled development policies and procedures (XDS0006), which cover all the workflow within the group

4.2.3.1. Engineering specifications

Xilinx Customer Document Review Procedure (SCP0001) defines the process used to assure the timely review, distribution and implementation of all customer engineering specifications and changes based on customer required schedule. Timely review should be as soon as possible, and shall not exceed two working weeks.

4.2.4. Control of Records

Records are established and maintained to provide evidence of conformity to requirements and of the effective operation of the QMS. Quality records shall remain legible and be readily identifiable and retrievable. Procedure, Record Retention Requirements (QAP0059) defines controls needed for the identification, storage, protection, retrieval, retention time and disposition of records. These controls shall satisfy regulatory and customer requirements.

4.2.5. QMS Documentation Structure, Figure 2

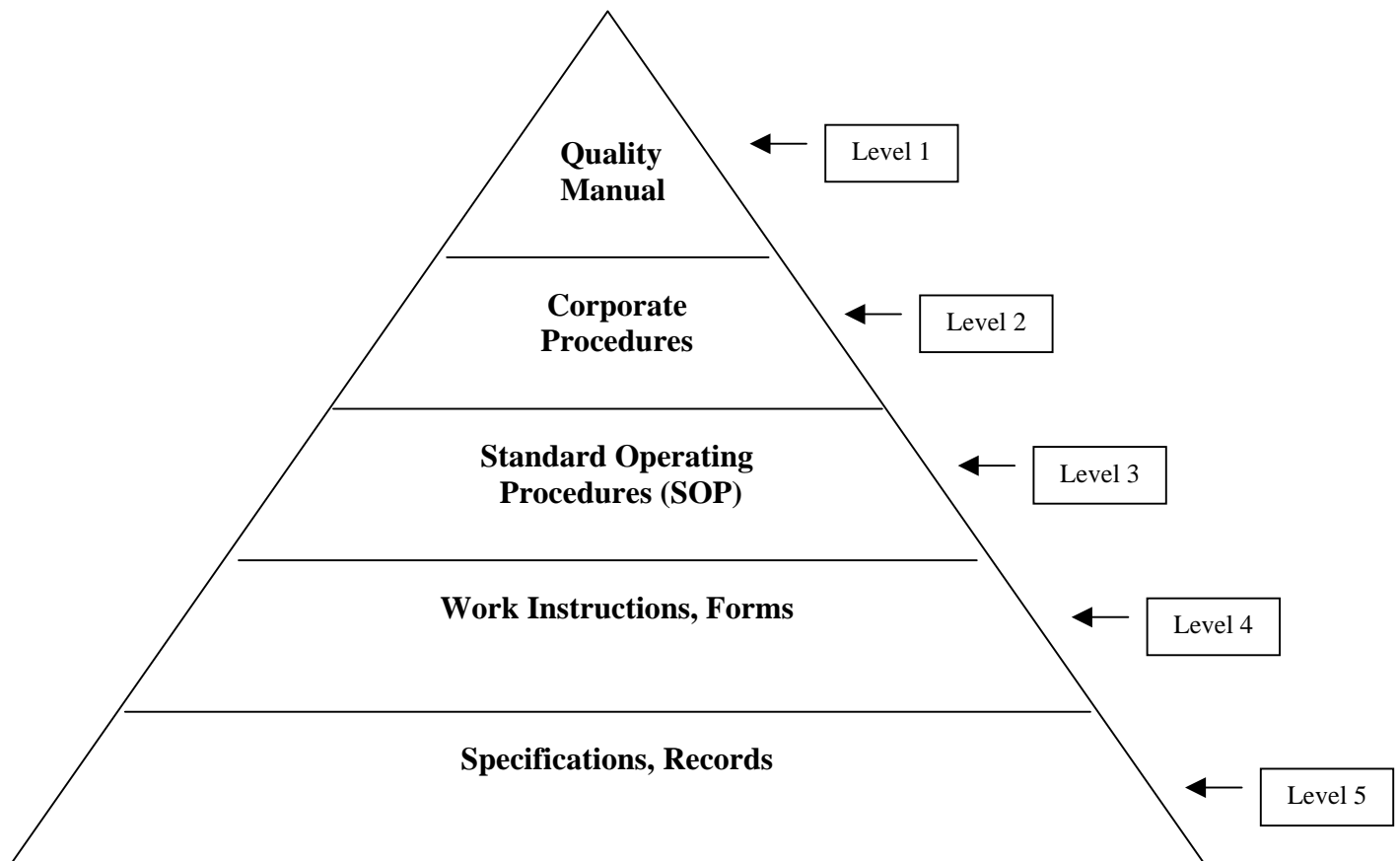


Figure 2 Key Reference Documents

Level 2 Corporate Procedures	Title	ISO 9000 References
DCC0003	Formal Document Release & Change Control	4.2.3
QAP0013,	Motivation, Training and Development	6.2.2.2
QAP0056	Internal Quality Audit	8.2.2
QAP0060	Material Review Board (MRB)	8.3
QAP0014	Corrective / Preventive Action	8.5.2, 8.5.3
DSP0021	Product Design	7.3
http://web/randd/software/program_management/ISO/HLP.html	Software Development	7.3
XDS0006	Design Services Handbook	7.3
QAP0133	Management Review	5.6
QCP0015	Corporate Supplier Management	7.4

Level 3 - Standard Operating Procedures

Level 4 - Other procedures, work instructions, and forms.

Level 5 - Specifications, technical drawings, reports, data, records, etc.

5. Management Responsibility

5.1. Management Commitment

Senior management is defined as the CEO and his staff. The Vice President of Quality and Reliability has implementation authority and responsibility for the Quality Management System.

At Xilinx, Senior Management is committed to developing, implementing, reviewing, and maintaining an effective and documented quality management system. This commitment includes: communicating the importance of meeting customer as well as statutory and regulatory requirements to the organization; establishing the quality policy and quality objectives; conducting management reviews; and ensuring availability of resources.

5.1.1. Process efficiency

Senior management reviews the product realization processes and the support processes to assure their effectiveness and efficiency.

5.2. Customer focus

Senior management ensures that customer requirements are determined and met with the aim of enhancing customer satisfaction. Customer focus is one of the company values, which govern all aspects of conducting business at Xilinx.

5.3. Quality Policy

Senior management ensures that the quality policy is appropriate to the purpose of the organization. The quality manual includes a commitment to comply with requirements and to continually improve the QMS. The quality policy is communicated throughout the organization and is reviewed for continuing suitability during the annual strategic development process.

5.4. Planning

5.4.1. Quality Objectives

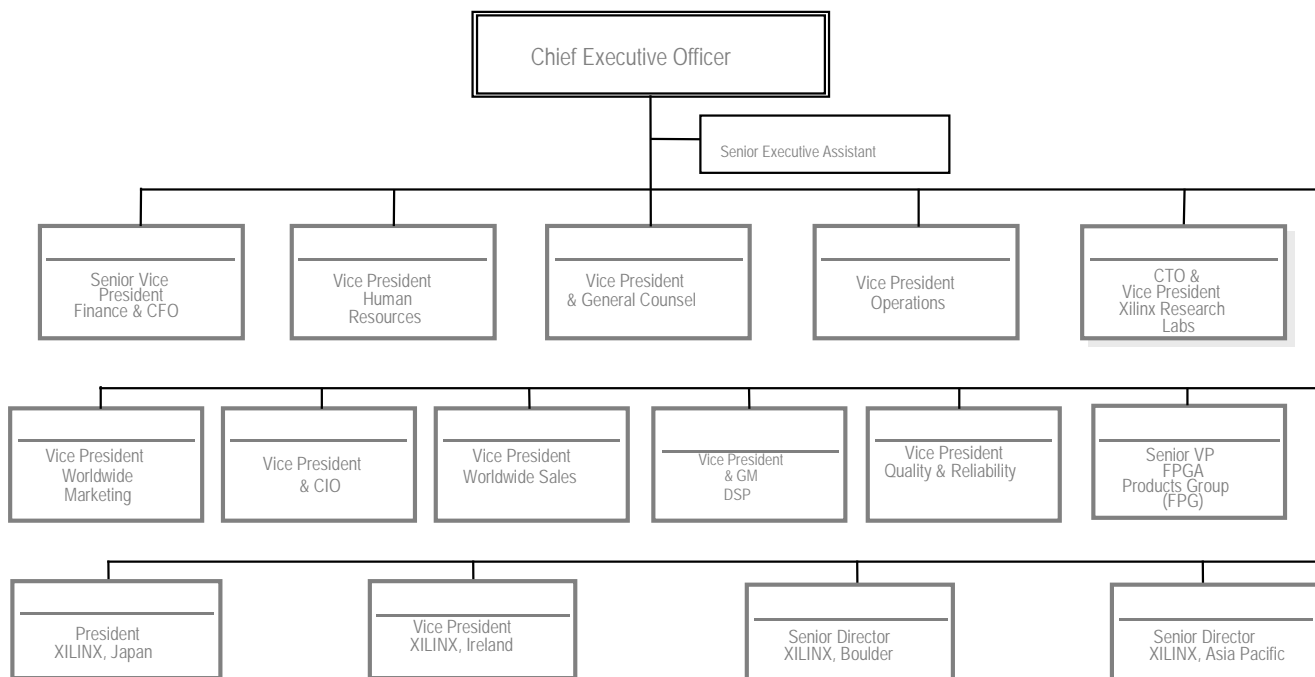
Quality objectives, including those needed to meet requirements for product are established at relevant functions and levels within the organization. Quality objectives are measurable and consistent with the quality policy and are included in the business plan. Metrics, owners, and targets are defined in the Management Review (QAP0133) procedure.

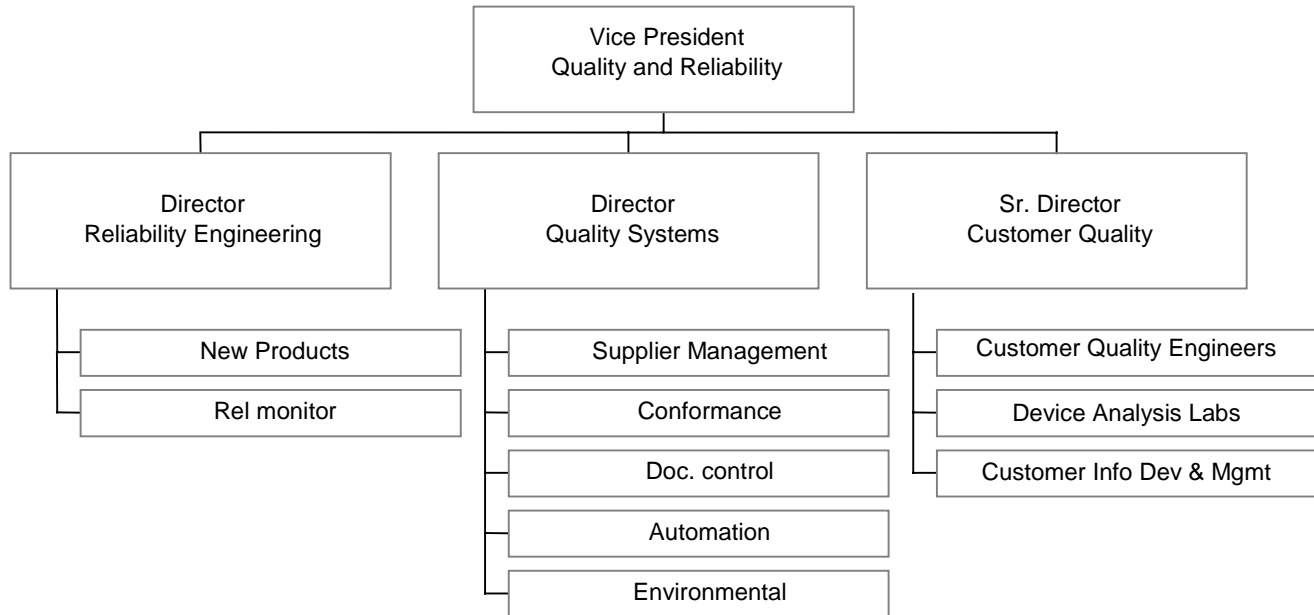
5.4.2. Quality Management System Planning

Quality system planning is carried out in order to meet the requirements of ISO9001 as well as the quality objectives. Changes to the QMS are planned and implemented in such a way to maintain the integrity of the QMS.

5.5. Responsibility, Authority, and Communication

5.5.1. Responsibility and Authority





5.5.1.1. Responsibility for Quality

Managers with the responsibility and authority for corrective action are promptly informed of products or processes, which do not conform to requirements.

Every employee of Xilinx is responsible for his or her actions in support of the quality policy. Every employee has the ability and responsibility to issue a “quality action request” to bring appropriate attention to any situation having a negative impact on quality at Xilinx.

5.5.2. Management Representative

Senior management has appointed the Director of Quality Systems as the Management Representative. The Management representative is responsible to develop, implement, and maintain the Quality Management System including processes, programs, systems and procedures to assure that product quality is maintained and improved in accordance with this manual & ISO9001, TL9000, TS16949, and Mil-prf-38535. This responsibility includes reporting to senior management on the performance of the QMS and promoting awareness of customer requirements throughout the organization. Each Xilinx site managing director has site responsibility, at their site, for implementation of the QMS along with the Director of Quality Systems.

5.5.2.1. Customer Representative

Senior management has appointed the Senior Director of Global Accounts as the Customer Representative. The Customer Representative is responsible to promote the needs of customers via the Quality Leadership forum. The scope of this can range from product issues to delivery concerns. The Customer Quality Engineering team is responsible for maintaining the customer

scorecard database. The Quality Leadership Forum will use these VOC (Voice of the Customer) inputs to drive actions to ensure that customer requirements are addressed.

5.5.3. Internal Communication

Internal communication is one of the effective tools for measuring the Quality Management System. The Operations Metric Review, the Strategic Review Board, and the Quality Leadership meetings are the main forums for internal communication. Other forums include:

- Daily Production Meetings
- OPM Project Review
- Cross Functional Teams
- Staff meetings
- New Product Introduction (NPI) Meetings

5.6. Management Review

5.6.1. General

Senior management reviews the organization's QMS to ensure its continuing suitability, adequacy and effectiveness (QAP0133). The review includes assessing opportunities for improvement and the need for changes to the QMS, including the Quality Policy and quality objectives. Reviews are scheduled monthly. Agendas vary each month depending on business needs and project stages. All required review topics are covered over the course of the year.

5.6.1.1. Quality management system performance

These reviews shall include all requirements of the QMS and its performance trends as an essential part of the continual improvement process. Part of the management review includes the monitoring of quality objectives, including cost of poor quality. Results are recorded providing evidence of the achievement of the quality objectives and customer satisfaction with product supplied.

5.6.2. Review input

Inputs to management review include: information on audit results; customer feedback; process performance and product conformity; status of preventive and corrective actions; follow-up of prior actions; changes that could affect the QMS; recommendations for improvement; and an analysis of actual and potential field failures including their impact on quality, safety or the environment.

5.6.3. Review output

The output from management review includes decisions and actions related to the improvement of the effectiveness of the QMS and its processes, the improvement of product related to customer requirements, and resource needs.

5.6.4. Other reviews

- Technology Review Board (TRB): A committee, established to oversee the QML (Qualified Manufacturing Line) Program. Xilinx High Reliability and Military products are qualified, processed, and manufactured in accordance with the QML Program requirements. Reference QAP0093 for additional TRB information.
- The Board of Directors has it's own Internal Audit committee responsible for review of business processes, with particular emphasis on Financial reporting and accounting methods.
- The Director of WW Compliance has responsibility for implementing the requirements of Sarbanes Oxley Exclusion 404; Import / Export compliance and other financial compliance activities.
- The VP & General Council is responsible for Legal compliance and is accountable to the Board of Directors in these matters.

6. Resource Management

6.1. Provision of Resources

Xilinx is committed to provide adequate resources for implementing, maintaining and continually improving the effectiveness of the QMS in order to enhance customer satisfaction by meeting customer requirements.

6.2. Human Resources

6.2.1. General Requirements

Employees performing work affecting product quality shall be competent on the basis of appropriate education, training, skills, and experience.

6.2.2. Competence, Awareness and Training

Department managers:

- Determine the necessary competence for employees performing work affecting product quality. In manufacturing, a competency model approach is used to document the specific training requirements.
- Make training available to employees or take other actions to satisfy competency needs.
- Evaluate the effectiveness of the actions taken. Demonstration of competency or certification measures training effectiveness of manufacturing operators.
- Ensure that employees are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.

- Ensure that appropriate records of education, training, skills and experience are maintained. Training completed through the Xilinx training department is recorded in the online training record database.

6.2.2.1. Product design skills

Employees with product design responsibility are competent to achieve design requirements and are skilled in applicable tools and techniques. Department managers with product design responsibility determine the applicable tools and techniques.

6.2.2.2. Training

Human Resources has established and maintained documented procedures for identifying training needs and achieving competence of all employees (QAP0013). Employees performing specific assigned tasks shall be qualified, as required, with particular attention to the satisfaction of customer requirements.

ESD training is provided to all employees with functions that involved any handling storage, packaging, preservation, or delivery of ESD sensitive products. The individual department management defines the training requirements for ESD.

6.2.2.3. Training on the job

The organization provides on-the-job training for employees in any new or modified job affecting product quality, including contingent workforce employees. Employees whose work can affect quality shall be informed about the consequences to the customer of nonconformity to quality requirements.

6.2.2.4. Employee motivation and empowerment

Xilinx is committed to employee motivation as a means of driving quality objective results, and promoting the principles of continual improvement and innovation consistent with the philosophy of the learning organization. A number of processes have been developed in order to support this.

The effectiveness of the various processes, which support motivation process, are measured via surveys (e.g. Fortune 100 best companies to work for) and assessed via PDP feedback.

- Performance appraisal process http://web/hr/train/perform_dev_process.htm
- Quarterly Values Medallion <http://web/values/>
- Ross Freeman Award <http://web/xrlabs/freeman/>
- Patents reward <http://web.xilinx.com/advdev/presentations/11>
- Venture Day
http://web.xilinx.com/finance/FCS_Crossroads/Internal_Venturing/index_files/nav5.htm

- Publication Award
http://web.xilinx.com/techsup/prod_apps/procedures/appnotes/PublicationAwardPolicy.htm
- “Spirit of Xilinx” course taught by CEO Wim Roelandts
- Day One Orientation and Quality 101 training courses cover: mission and vision of Quality org, focus on customer needs, how you impact quality, corporate quality objectives. (see http://web/hr/train/course_schedule.htm)

The quality organization conducts an annual survey to measure the extent to which employees are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.

6.3. Infrastructure / Work Environment

At Xilinx, the Facilities, Real Estate and Workspace Services department provides the infrastructure and work environment necessary to achieve conformity of product requirements by maintaining:

- Buildings, workspace and associated utilities
- Process equipment
- Security
- Safety
- Preventative Maintenance of, and purchase of plant equipment
- Ground Maintenance
- Janitorial Services
- Cafe Services

6.3.1. Plant, facility and equipment planning

A multidisciplinary approach is used to develop plant, facility and equipment plans. Plant layouts optimize material travel, handling and value added use of floor space and facilitate synchronous material flow. Methods shall be developed and implemented to evaluate and monitor the effectiveness of existing operations.

The infrastructure and work environment of Xilinx is planned and supported by:

- Manufacturing engineering maintains all equipment specific to manufacturing.
- Manufacturing operations maintains the work environment necessary to achieve conformity to product requirements.
- IT maintains systems/network
- Technical Services maintains all phones / faxes / computers / printers
- Lab technicians maintain equipment specific to the reliability and failure analysis labs.

6.3.2. Contingency plans

Business continuity plans (BCP) are created to satisfy customer requirements in the event of an emergency such as utility interruptions, labor shortages, key equipment failure and field returns. The BCPs are documented and reviewed in order to ensure continued supply of products and services to customers.

6.4. Work environment

Xilinx defines and manages the work environment needed to achieve conformity to product requirements.

6.4.1. Employee safety to achieve product quality

Xilinx shall address product safety and means to minimize potential risks to employees, especially in the design and development process and in manufacturing process activities. Xilinx has a comprehensive Environmental Health & Safety Program. This system is structured around ISO-14001: 2004.

6.4.2. Cleanliness of premises

Xilinx maintains its premises in a state of order, cleanliness and repair consistent with the product and manufacturing process needs.

7. Product Realization

7.1. Planning of product realization

Xilinx product life cycle model includes processes defining product definition, design and development, qualification, ongoing manufacture and delivery, and obsolescence. Process maps are shown in figure 1 and appendix B. Planning of product realization is consistent with the requirements of the QMS (DPS0021, http://web/randd/software/program_management/ISO/, XDS0006).

Management determines quality objectives and requirements for the product and the need to establish processes, documents, and resources required for verification, validation, monitoring, inspection, and testing specific to the product and the criteria for product acceptance. Records are defined to provide evidence that the product realization process and the resulting product meet QMS and customer requirements.

7.1.1. Planning of product realization – customer requirements

Customer requirements and references to its technical specifications shall be included in the planning of product realization as a component of the quality plan.

7.1.2. Acceptance criteria

Acceptance criteria shall be defined by the organization and, where required, approved by the customer. Acceptance level shall be zero defects for attribute data sampling.

7.1.3. Confidentiality

The organization shall ensure the confidentiality of projects under development, and related product information.

7.1.4. Change control

The organization has processes to control and react to changes that impact product realization. The effects of any change, including those caused by suppliers, shall be assessed, verified, and validated to ensure compliance to customer requirements before implementation. The organization shall maintain a record of the date on which each change is implemented in production. The implementation of changes includes updated documents. Changes with impact on form, fit, and function will be notified to customers prior to implementation and where required, customer approval and additional customer verification requirements will be met (QAP0009).

7.2. Customer-Related Processes

7.2.1. Determination of Requirements Related to the Product

Xilinx defines product requirements. Product requirements include those specified by the customer, those not stated by the customer but necessary for the intended use, statutory and regulatory requirements related to the product, delivery and post delivery activities, and any additional requirements defined by Xilinx.

7.2.1.1. Customer-designated special characteristics

Currently, Xilinx will not accept business on any products or services in which the customer requirements include designation, documentation, or control of special characteristics. Processes will be updated to demonstrate conformity to customer requirements for designation, documentation and control of special characteristics if business including these requirements is accepted in the future.

7.2.2. Review of requirements related to the product

Xilinx reviews product related requirements per the customer drawing, order entry, and customer service procedures (SCP0001, CUS0002). These reviews are conducted prior to any commitment to supply a product to the customer and ensure that product requirements are defined, contract or order requirements differing from those previously expressed are resolved, and the organization has the ability to meet the defined requirements. Records of the results of the review and actions arising from the review are maintained. Where the customer provides no

documented statement of requirement, the customer requirements are confirmed before acceptance. Where product requirements are changed, the organization shall ensure that relevant documents are amended and that relevant employees are made aware of the changed requirements.

7.2.2.1. Review of requirements related to the product - waiver

Waiving the requirement stated in 7.2.2. for a formal review shall require customer authorization.

7.2.2.2. Organization manufacturing feasibility

Xilinx investigates, confirms, and documents the manufacturing feasibility of the proposed product in the contract review process, including risk analysis.

7.2.3. Customer Communication

At Xilinx, customer communication is vital to customer satisfaction. The organization has determined effective arrangements for communicating with customers regarding product information, inquiries, contracts or order handling, including amendments, customer complaints, customer feedback and product quality alert notifications.

The Internet is used to keep customers up to date with the latest information. The Sales Partner Web (SPW) site contains the following customer education program, and is available globally:

- Customer Training Presentations
- Course Information
- Customer Education Materials
- Key Contacts for Customers
- Lead-time

7.2.3.1. Customer communication – customer specified format

Xilinx shall have the ability to communicate necessary information, including data, in a customer-specified language and format.

7.3. Design and Development

IC Design and Development:

A documented IC design flow describing the general guidelines and procedures of the Xilinx design process is established and maintained through Document Control. This is documented in DPS0021, IC Design Flow.

Software Design and Development:

Software design processes are established and documented by the Design Software Division. These processes are described in the design high level process (Appendix B1), and the XSP website (<http://web/randd/software/>)

7.3.1. Design and Development Planning

The organization shall plan and control the design and development of product. During the design and development planning, the organization determines the design and development stages, the review, verification and validation that are appropriate to each design and development stage, and the responsibilities and authorities for design and development. The organization manages the interfaces between all groups involved in design and development to ensure effective communication and clear assignment of responsibility. Planning output is updated as the design and development progresses.

7.3.1.1. Multidisciplinary approach

Xilinx uses a multidisciplinary approach to prepare for product realization including development / finalization and monitoring of special characteristics (key parameters), development and review of FMEAs, including actions to reduce potential risks, and development and review of control plans.

7.3.2. Design and development inputs

Inputs relating to product requirements are determined and records are maintained. Inputs include: functional and performance requirements, applicable statutory and regulatory requirements, information derived from previous similar designs, and other requirements essential for design and development. These inputs are reviewed for adequacy. Requirements are complete, unambiguous and not in conflict with each other.

7.3.2.1. Product design input

The organization identifies, documents, and reviews the product design inputs requirements. This includes customer requirements (contract review), identification, traceability, packaging, targets for product quality, life, reliability, durability, maintainability, timing and cost. The organization shall have a process to deploy information gained from previous design projects, competitor analysis, supplier feedback, internal input, field data, and other relevant sources for current and future projects of a similar nature.

7.3.2.2. Manufacturing process design input

The organization identifies, documents, and reviews the manufacturing process design inputs requirements including product design output data, targets for productivity, process capability and cost, customer requirements, if any, and experience from previous developments.

7.3.2.3. Special characteristics

See section 7.2.1.1.

7.3.3. Design and development outputs

The outputs of design and development shall be provided in a form that enables verification against the design and development input and shall be approved prior to release. Design and development outputs shall meet the input requirements for design and development, provide appropriate information for purchasing, production and for service provision, contain or reference product acceptance criteria, and specify the characteristics of the product that are essential for its safe and proper use.

7.3.3.1. Product design outputs

The product design output shall be expressed in terms that can be verified and validated against product design input requirements. The product design output includes DFMEA, reliability results, product special characteristics and specifications, product error-proofing as appropriate, product definition including drawings or mathematically based data, product design reviews results, and diagnostic guidelines where appropriate.

7.3.3.2. Manufacturing process design output

The manufacturing process design output is expressed in terms that can be verified against manufacturing process design input requirements and validated. The manufacturing process design output shall include: specifications and drawings, manufacturing process flow chart and layout, manufacturing process FMEAs, control plans, work instructions, process approval acceptance criteria, data for quality, reliability, maintainability, and measurability, results of error-proofing activities as appropriate, and methods of rapid detection and feedback of product and manufacturing process nonconformities.

7.3.4. Design and development review

Systematic reviews of design and development are performed in accordance with planned arrangements to evaluate the ability of the results of design and development to meet requirements and to identify any problems and propose necessary actions. Participants shall include representatives of functions concerned with the design and development stages being reviewed. Records of the results of the reviews and any necessary actions shall be maintained.

7.3.4.1. Monitoring

Measurements at specified stages of design and development shall be defined, analyzed, and reported with summary results as an input to management review.

7.3.5. Design and development verification

Verification shall be performed in accordance with planned arrangements to ensure that the design and development outputs have met the design and development input requirements. Records of the results of the verification and necessary actions shall be maintained.

7.3.6. Design and development validation

Design and development validation shall be performed in accordance with planned arrangements to ensure that the resulting product is capable of meeting the requirements for the specified application or intended use, where known. Wherever practicable, validation shall be completed prior to the delivery or implementation of the product. Records of the results of validation and any necessary actions shall be maintained.

7.3.6.1. Design and development validation – customer requirements

Design and development validation shall be performed in accordance with customer requirements including program timing.

7.3.6.2. Prototype program

When required by the customer, Xilinx will have a prototype program and control plan. Xilinx will use, wherever possible, the same suppliers, tooling and manufacturing processes as will be used in production. All performance testing activities shall be monitored for timely completion and conformity to requirements. While services may be outsourced, the organization shall be responsible for the outsourced services, including technical leadership.

7.3.6.3. Product approval process

Xilinx shall conform to a product and manufacturing process approval procedure recognized by the customer. This product and manufacturing process approval procedure shall also be applied to suppliers.

7.3.7. Control of design and development changes

Design and development changes are identified and records are maintained. The changes shall be reviewed, verified, validated as appropriate, and approved before implementation. The review of design and development changes includes evaluation of the effect of the changes on constituent parts and product already delivered. Records of the results of the review of changes and necessary actions shall be maintained.

7.4. Purchasing

7.4.1. Purchasing process

The Xilinx purchasing system described in PSP0008, and PSP0011 General Flow for Purchasing Process ensures that products, materials, and services purchased from suppliers and subcontractors conform to requirements including applicable regulatory requirements. The purchasing department reviews all purchase requisitions to ensure that appropriate levels of management, as determined by the spending and authorization policy, have been approved per FRC0337.

The type and extent of control applied to the supplier and the purchased product shall be dependent upon the effect of the purchased product on subsequent product realization or the final product.

The organization evaluates and selects suppliers based on their ability supply products in accordance with the organization's requirements. Criteria for selection, evaluation, and re-evaluation are established (QAP0010). Records of evaluations and any necessary actions arising from the evaluation shall be maintained.

7.4.1.1. Regulatory conformity

All purchased products or materials used in product shall conform to applicable regulatory requirements.

7.4.1.2. Supplier quality management system development

Xilinx performs supplier quality management system development with the goal of supplier conformity with TS16949. Conformity to ISO9001 is the first step in achieving this goal. Prioritization of suppliers for development depends upon the suppliers' quality performance and the importance of the product supplied. Unless otherwise specified by the customer, suppliers to Xilinx shall be third party registered to ISO9001 by an accredited third party certification body.

7.4.1.3. Customer-approved sources

Where specified by the contract, Xilinx shall purchase products, materials or services from approved sources. The use of customer designated sources does not relieve the organization of the responsibility for ensuring the quality of purchased products.

7.4.2. Purchasing information

Purchasing information shall describe the product to be purchased, including where appropriate requirements for approval of product, procedures, processes and equipment, requirements for qualification of employees, and QMS requirements. Xilinx ensures the adequacy of specified purchase requirements prior to their communication to the supplier. Purchasing is also responsible for ongoing support, risk analysis, supply base management, and contract definition and ensuring that proprietary, usage and licensing agreements are completed.

7.4.3. Verification of purchased product

Xilinx has established and implemented inspection or other activities necessary to ensure that purchased products meets specified purchase requirements. If Xilinx or its customer intends to perform verification at the supplier's premises, the intended verification arrangements and method of product release will be stated in the purchasing information.

7.4.3.1. Incoming product quality

Incoming product quality is assured by utilizing one or more of the following methods:

- Evaluation of supplier statistical data
- Receiving inspection sampling plans
- Second or third party assessments coupled with records of acceptable delivered product quality
- Part evaluation by a designated laboratory

7.4.3.2. Supplier monitoring

Supplier performance is monitored through the following indicators:

- Delivered product quality
- Customer disruptions including field returns
- Delivery schedule performance
- Special status customer notifications related to quality or delivery issues

Quality and delivery performance ratings shall be transmitted to the suppliers based on supplier activity. Purchasing and Supplier Quality Assurance shall administer the evaluation of supplier performance.

An Approved Vendor List (AVL) of suppliers of products, materials, and services that may impact product quality is maintained per QCP0015, Approved Vendor List (AVL) procedure. Requirements for approval of subcontractors and suppliers are defined in QAP0010, Supplier/Subcontractor Qualification/Certification and Quality Systems Guidelines.

Outsource processes that affect product conformity, are listed in the approved vendors lists (QCP0015).

Where specified in the contract, Xilinx's customer or the customer's representative shall be afforded the right to verify at Xilinx' and/or Xilinx' subcontractor's facilities that subcontracted products conform to specified requirements.

7.5. Production and Service Provision

7.5.1. Control of Production and Service Provision

Manufacturing processes at Xilinx are carried out under controlled conditions. Controlled conditions include:

- Information describing the characteristics of the product
- Work instructions, as necessary
- Use of suitable equipment
- Use of monitoring and measuring devices
- Implementation of monitoring and measurement
- Implementation of release, delivery and post delivery activities

7.5.1.1. Control plan

Xilinx shall develop control plans for the processes that produce products supplied to our customers. In the case of outsourced processes, Xilinx shall ensure that the suppliers develop control plans. Control plans shall take into account the DFMEA and manufacturing PFMEAs.

Control plans shall list the controls used for manufacturing process control, include methods for monitoring of control over special characteristics (key parameters), include any customer required information, and initiate a specified reaction plan when the process becomes unstable or not statistically capable. Control plans shall be reviewed and updated when changes occur affecting product, manufacturing process, measurement, logistics, supply sources or FMEA.

Xilinx generated control plans and FMEAs will be maintained within the document control system (see section 4.2.3). Supplier owned control plans and FMEAs will be maintained within the supplier's document control system. Supplier documents will be requested and used as required then returned or destroyed. Additionally, these documents will be reviewed during the annual quality audits as indicated in the Corporate Supplier Management Procedure (QCP0015).

7.5.1.2. Work instructions

Documented work instructions for all employees having responsibilities for the operation of processes that impact product quality are be accessible for use at the workstation. These instructions shall be derived from sources such as the quality plan, the control plan and the product realization process.

7.5.1.3. Verification of job set-ups

Job set ups shall be verified when performed. Work instructions shall be available for set-up employees.

7.5.1.4. Preventive and predictive maintenance

Operations shall identify key process equipment and provide resources for machine maintenance and develop an effected planned total preventive maintenance system (TSP0079, EQP0040). As a minimum, this system shall include planned maintenance activities, packaging and preservation of equipment, tooling and gauging, availability of replacement parts for key manufacturing equipment, documenting, evaluating and improving maintenance objectives. Operations shall utilize predictive maintenance methods to continually improve the effectiveness and the efficiency of production equipment.

7.5.1.5. Management of production tooling

Xilinx provides resources for tool and gauge design, fabrication and verification activities through the use of our fab and assembly subcontractor partners. Xilinx's supplier management process (QAP0010, QCP0015) reviews the subcontractors' system for production tooling management including:

- Maintenance and repair facilities and employees
- Storage and recovery
- Set-up
- Tool-change programs for perishable tools
- Tool design modification documentation, including engineering change level,
- Tool modification and revision documentation
- Toll identification, defining the status, such as production, repair or disposal
- Monitor system for all activities that are outsourced

7.5.1.6. Production scheduling

Production scheduling is order driven to meet customer requirements.

7.5.1.7. Feedback of information from service

After sales support includes customer problem resolution and is defined in the Customer Critical Issue Management Procedure (QAP0146).

7.5.1.8. Service agreement with customer

Currently, Xilinx does not provide after sales service through a service agreement.

Processes will be updated to meet customer requirements if service agreements are accepted in the future.

7.5.2. Validation of processes for production and service provision

Xilinx validates processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement. Validation demonstrates the ability of the processes to achieve planned results. Xilinx establishes defined criteria for review and approval of the process, approval of equipment and qualification of employees, use of specific methods and procedures, requirements for records and re-validation. The primary validation of integrated circuits is through use of electrical test data. Software first articles are validated prior to volume manufacturing.

7.5.2.1. Validation of processes for production and service provision

The requirements of 7.5.2 apply to all processes for production and service provision.

7.5.3. Identification and Traceability

Xilinx maintains comprehensive and inclusive product identification and traceability processes, procedures and systems. Xilinx processes encompass the planning, testing and inspection; consequently, these systems also incorporate inspection and test status.

Identification and traceability is maintained down to the individual device level by means of device marking criteria, electronic WIP tracking system, and a paper system (e.g., lot travelers, labels, inspection stamps).

7.5.4. Customer Property

The control of customer property is outlined in the procedures referenced in the document reference table. Customer supplied items are identified, safeguarded from loss or damage and, handled in the same manner as other incoming products to ensure conformance to requirements. If customer property is lost or damaged, or found unsuitable for use, this status is recorded and promptly reported to customers. Customer supplied data can include the following:

Type	Owner	Control Mechanism
EasyPath designs	Product Technology	EAP0001
Designs for RMA debug	Customer Quality Engineering	QAP0146, QAP0120

7.5.4.1. Customer-owned production tooling

Customer owned tools, manufacturing, test, inspection tooling and equipment shall be permanently marked so that the ownership of each item is visible, and can be determined.

7.5.5. Preservation of product

Detailed procedures have been established and maintained to preserve the conformity of product during internal processing and delivery to the intended destination. This preservation includes identification, handling, packaging, storage and protection. Preservation also applies to the constituent parts of a product. These procedures include proper methods for adding or removing product from tubes or trays, methods for transport of product from one location to another, methods to prevent electrostatic discharge damage. Cleanliness to the extent necessary to prevent deterioration or damage of product is required at all locations where product is processed or stored.

All products shall be packaged for shipment from Xilinx in a manner to prevent mechanical, electrical, or electrostatic damage to devices. Full compliance to specific customer and Xilinx requirements regarding packing materials and labeling requirements are maintained.

7.5.5.1. Storage and inventory

The condition of product in stock shall be assessed at appropriate planned intervals in order to detect deterioration. The inventory management system shall optimize inventory turns over time and assure stock rotation. Obsolete product shall be controlled in a similar manner to nonconforming product.

7.6. Control of Monitoring and Measuring Devices

Xilinx determines the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of product to determined requirements. Processes are established to ensure that monitoring and measurement can be carried out and are carried out in a manner that is consistent with the monitoring and measurement requirements. All inspection, measurement and test equipment used in the manufacturing and end-point acceptance inspection of Xilinx products shall be placed into the Xilinx Calibration System. The system (QAP0015) specifies measurement equipment to be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards. The basis used for calibration or verification shall be recorded where no such standards exist. Measurement equipment shall be adjusted or re-adjusted as necessary, assigned a calibration control number, and given a calibration sticker to enable the calibration status to be determined. Measurement equipment shall be safeguarded from adjustments that would invalidate the measurement result. Measurement equipment shall be protected from damage and deterioration during handling, maintenance and storage. A recall system is used to ensure that all such identified equipment is calibrated within the prescribed interval, or is withdrawn from use (and suitably identified) until calibrated. Records are maintained to provide evidence of conformity of product to determined requirements. The organization assesses and records the validity of the previous measuring results when the equipment is found not to conform to requirements. The organization shall take appropriate action on the equipment and any product affected. Computer software used in the monitoring and measurement of specified requirements shall be confirmed prior to initial use and reconfirmed as necessary. Equipment used to perform calibration are traceable to national or international standards.

7.6.1. Measurement system analysis

Statistical studies are conducted to analyze the variation present in the results of each type of measuring and test equipment system. This applies to key measurement systems referenced in the control plan. The analytical methods and acceptance criteria used shall conform to those in customer reference manuals on measurement systems analysis.

7.6.2. Calibration / verification records

Records of the calibration / verification activity for all gauges, measuring and test equipment needed to provide evidence of conformity of product requirements, including customer and employee owned equipment shall include:

- Equipment identification, including the measurement standard against which the equipment is calibrated
- Revisions following engineering changes
- Any out of specification readings as received for calibration / verification
- An assessment of the impact of out of specification condition
- Statements of conformity to specification after calibration / verification
- Notification to the customer if suspect product or material has been shipped

7.6.3. Laboratory requirements

7.6.3.1. Internal laboratory

Internal laboratories shall have a defined scope that includes its capability to perform the required inspection, test, or calibration services. The laboratory scope shall be included in the QMS documentation. The laboratory shall specify and implement technical requirements for adequacy of the laboratory procedures, competency of the laboratory employees, testing of the product, capability to perform these services correctly, traceable to the relevant process standard, and review of the related records.

7.6.3.2. External laboratory

External laboratories used for inspection, test, or calibration services shall have a defined laboratory scope that includes its capability to perform the required inspection, test, or calibration and either have evidence that it is acceptable to the customer or be accredited to ISO/IEC 17025.

8. Measurement, Analysis and Improvement

8.1. General

Management plans and implements the monitoring, measurement, analysis and improvement processes needed to ensure conformity of products, services, and the QMS, and to continually improve the QMS. These processes define necessary methodologies, including statistical techniques, and the extent of their use.

8.1.1. Identification of statistical tools

Xilinx reviews internal processes for the application of statistical technique especially statistical process control (SPC) during advance quality planning. Implementation of SPC will be performed in accordance with the requirements define within the Policy and Process Control Quality System (QAP0126).

Statistical techniques are used as necessary to control the manufacturing processes of Xilinx, its wafer foundries, assembly and test subcontractors. Subcontractors are responsible for the implementation and review of SPC within their processes, and are monitored by Xilinx.

Xilinx works with individual wafer foundries and assembly subcontractors to define critical parameters to be monitored and supplied to Xilinx on a periodic basis.

8.1.2. Knowledge of basic statistical concepts

Basic statistical concepts such as variation, control (stability), process capability and over adjustment shall be understood and utilized by employees in areas where processes require statistical techniques.

8.2. Monitoring and Measurement

8.2.1. Customer satisfaction

Senior management has established processes to measure and monitor customer satisfaction and to continually use this information to improve performance. This includes customer perception as to whether the organization has met customer requirements. The methods used to collect this data include:

- Delivery performance
- Customer Visits
- Customer Scorecards
- Customer Hotline
- Customer Complaint
- RMA Process
- CAR (Corrective Action Reports)
- Supplier Audits
- Distributor Audits
- Web Surveys

8.2.1.1. Customer satisfaction – realization process evaluation

Customer satisfaction is also monitored through the continual evaluation of the realization process. Performance indicators based on objective data include:

- Delivered part quality performance
- Customer disruptions including field returns
- Delivery schedule performance
- Customer notifications related to quality or delivery issues

Xilinx does not monitor incidents of premium freight as it is Xilinx and industry standard practice to ship all products via fastest (air) methods. Xilinx monitors the performance of manufacturing process to demonstrate compliance with customer requirements for product quality and efficiency of the process.

8.2.2. Internal Quality Audit

Internal auditing of Xilinx processes, operations, QMS, and records is a key constituent of the Quality System. Internal quality audits are prioritized, scheduled, performed, reported, and followed up in accordance with the requirements of QAP0056. This includes the responsibilities and requirements for planning, conducting, reporting results, and maintaining audit records. Internal audits determine if the QMS conforms to the requirements of ISO9001, TL9000, TS16949, and to the QMS requirements established by Xilinx. Internal audits also determine if the QMS is effectively implemented and maintained. Audit planning takes into consideration the status and importance of the processes and areas to be audited, as well as the results of previous audits. Audit planning defines the audit criteria, scope, frequency and methods used. The audit process ensures objectivity and impartiality. Auditors do not audit their own work. Audit findings are entered into the CAR system to ensure that management of the audited area takes actions without undue delay to eliminate detected non-conformities. Follow up activities include the verification of the actions taken. Internal quality audit recommendations and results are reviewed as part of management review.

8.2.2.1. Quality management system audit

The QMS is audited to verify compliance with TS16949 and all additional QMS requirements.

8.2.2.2. Manufacturing process audit

Each manufacturing process is audited to determine its effectiveness (QCP0015, QCP0059).

8.2.2.3. Product audit

Product audits are conducted at appropriate stages of production and delivery to verify conformity to all specified requirements such as product dimensions, functionality, packaging, and labeling at a defined frequency. (QCP0044)

8.2.2.4. Internal audit plans

Internal audits cover all quality management related processes, activities, and shifts. Internal audits are scheduled according to an annual plan. When non-conformities or customer complaints occur, the audit frequency shall be appropriately increased (QAP0056).

8.2.2.5. Internal audit qualification

Internal auditors shall be qualified to audit the requirements of the applicable standard.

8.2.3. Monitoring and Measurement of Processes

Xilinx has implemented procedures that include methods of monitoring QMS processes, including measurement where appropriate. These methods confirm the continuing ability of

QMS processes to meet planned results. When such results are not achieved, corrective action is taken to ensure product and service conformity.

8.2.3.1. Monitoring and measurement of manufacturing processes

Manufacturing process studies are conducted within the development process on all new manufacturing processes to verify process capability and to provide additional input for process control prior to release. The results are documented with specifications for means of production, measurement and test, and maintenance instructions. These documents shall include objectives for manufacturing process capability, reliability, maintainability and availability, as well as acceptance criteria.

Xilinx shall ensure the maintenance of manufacturing process capability or performance as specified by the customer part approval process requirements. Control plans and process flow diagrams are implemented to the specified measurement techniques, sampling plans, acceptance criteria, and reaction plans when acceptance criteria are not met.

Significant process events such as tool change or machine repair shall be recorded.

Xilinx shall ensure that a reaction plan from the control plan is initiated for characteristics that are either not statistically capable or are unstable. These reaction plans shall include containment of product and 100% inspection as appropriate. A corrective action plan shall then be completed by the organization, indicating specific timing and assigned responsibilities to assure that the process becomes stable and capable. The plans shall be reviewed with and approved by the customer when so required.

The organization shall maintain records of effective dates of process changes.

Where manufacturing processes are outsourced, Xilinx ensures that these requirements are met either within Xilinx or the partner supplier company.

8.2.4. Monitoring and Measurement of Product

At Xilinx product quality and reliability is monitored and measured at every stage of the process from the Design & Development of the product, through to Manufacturing Processes, Planning for Product Realization, Management Review and Preventive Action.

Evidence of conformity with acceptance criteria is maintained. Records indicate the person(s) authorizing release of product.

Product release and service delivery occurs after planned arrangements have been satisfactorily completed, unless otherwise approved by a relevant authority and where applicable by the customer.

8.2.4.1. Layout inspection and functional testing

A layout inspection and a functional verification to applicable customer engineering material and performance standards shall be performed for each product as specified in the control plans. Results are available for customer review.

8.2.4.2. Appearance items

Currently, Xilinx does not manufacture parts designated as appearance items. Processes will be updated to meet customer requirements if business including appearance items is accepted in the future.

8.3. Control of Nonconforming Product

Non-conforming materials or products are segregated and identified to prevent its unintended use pending investigation of root cause, and to assess to what extent the non-conformance may impact other products, processes or services.

When materials, products, processes and services are found to be nonconforming to applicable procedures, specifications, drawings, or customer contractual agreements, a Material Review Board (MRB) may be initiated by a Xilinx employee to evaluate and disposition the matter. The MRB disposition process (QAP0060) includes the control of rework, customer notification, and customer waiver as appropriate.

Nonconforming product can be dealt with by one or more of the following ways:

- By taking action to eliminate the detected nonconformity.
- By authorizing its use, release or acceptance under concession by a relevant authority and, where applicable, by the customer.
- By taking action to preclude its original intended use or application.

Records of the nonconformity and subsequent actions taken, including concessions obtained, are maintained. When nonconforming product is corrected it shall be re-verified to demonstrate conformity to the requirements. When nonconforming product is detected after delivery or use has started, Xilinx shall take action appropriate to the effects, or potential effects, of the nonconformity.

8.3.1. Control of nonconforming product – unidentified status

Product with unidentified or suspect status shall be classified as nonconforming product.

8.3.2. Control of reworked product

Instructions for rework, including re-inspection requirements, shall be accessible to and utilized by the appropriate employees.

8.3.3. Customer information

Customers shall be informed promptly in the event that nonconforming product has been shipped.

8.3.4. Customer waiver

Xilinx shall obtain a customer waiver prior to further processing whenever the product or manufacturing process is different from that which is currently approved. The waiver record shall contain the expiration date or quantity authorized. Xilinx shall ensure compliance with the original or superseding specifications and requirements when the waiver expires. Material shipped on a waiver shall be properly identified on each shipping container. This applies equally to purchased product. Xilinx shall agree with any requests from suppliers before submission to the customer.

8.4. Analysis of Data

Data on the QMS processes is collected, reported, and analyzed through Management and other Reviews, by Corrective & Preventative Action Systems, and through internal audits. The analysis of data provides information relating to customer satisfaction, conformity to product requirements, characteristics and trends of processes and products including opportunities for preventive action, and suppliers. Data is also collected through the following Xilinx Customer Satisfaction programs:

- Customer Complaints
- Customer Scorecards
- RMA Process
- Customer Visits
- Distributor Audits
- Supplier Audits
- Delivery of product performance
- Cycle time of manufacturing
- Outgoing inspection PPM rates

The analysis on all of the above determines the effectiveness of the QMS and highlights the areas that need to be addressed for continual improvement of the QMS.

8.4.1. Analysis and use of data

Trends in quality and operational performance shall be compared with progress toward objectives and lead to action to support the following:

- Development of priorities for prompt solutions to customer related problems.

- Determination of key customer related trends and correlation for status review, decision making and longer term planning.
- An information system for the timely reporting of product information arising from usage.

8.5. Improvement

8.5.1. Continual Improvement

The continual improvement process is a company wide methodology to improve the effectiveness of the QMS through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review. Findings are reviewed with management and appropriate projects and or actions are taken to implement the necessary improvements.

It is the responsibility of the functional managers to promote the principles of continual improvement throughout their functions and encourage their respective organizations to take full responsibility for implementing this.

8.5.1.1. Continual improvement of the organization

QAP0159 defines the process for continual improvement.

8.5.1.2. Manufacturing process improvement

Manufacturing process improvement shall continually focus upon control and reduction of variation in product characteristics and manufacturing process parameters.

8.5.2. Corrective Action

The corrective action process incorporates a systematic step-by-step corrective action problem solving approach (8-D process) used to identify the cause of nonconformity, eliminate the cause and prevent recurrence. A documented procedure (QAP0014) defines requirements for reviewing nonconformities, determining their causes, evaluating the need for action to prevent recurrence, determining and implementing action, recording of the results of actions taken, and reviewing corrective action taken.

8.5.2.1. Problem solving

Xilinx has a defined process for problem solving leading to root cause identification and elimination. Xilinx will use a customer prescribed problem-solving format if it exists.

8.5.2.2. Error proofing

Error proofing methods are used within the corrective action process.

8.5.2.3. Corrective action impact

The organization shall apply to other similar processes and products the corrective action, and controls implemented, to eliminate the cause of nonconformity.

8.5.2.4. Rejected product test / analysis

Xilinx analyzes parts rejected by the customer's manufacturing plants, engineering facilities and dealerships. Xilinx minimizes the cycle time of this process. Records of these analyses are kept and made available upon request. Xilinx performs analysis and initiates corrective action to prevent recurrence.

8.5.3. Preventive Action

As part of a continuous drive for improvement within our processes data is collected and analyzed to eliminate the causes of potential nonconformities in order to prevent their occurrence. The preventive action process (QAP0014) addresses potential nonconformity cause, actions to prevent occurrence, records of results of action taken, and the review of action taken. Xilinx reviews the findings at various levels of management review and take appropriate action to address areas of concern.

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APPENDIX A: XILINX DOCUMENTS CROSS REFERENCE TABLES

GENERAL REQUIREMENT	ISO 9001:2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
TITLE		QAP0002	
PURPOSE		QAP0002, ISO9001, TL9000, TS16949	
SCOPE		QAP0002	
REFERENCED DOCUMENTS		QAP0002	
RESPONSIBILITY		QAP0002	QAP0133
REQUIRMENTS		QAP0002	
QUALITY MANAGEMENT SYSTEMS	4.0	QAP0002, ANSI/NCSL Z540-1-1994, MIL-PRF-38535, MIL-STD-883, ISO9001, TL9000, TS16949	QAP0133, QAP0093
GENERAL	4.1	QAP0002, ANSI/NCSL Z540-1-1994, MIL-PRF-38535, MIL-STD-883, ISO9001, TS16949, TL9000, ISO/TS-16949 Semiconductor Commodity	QAP0133, QAP0093, QAP0163 Sequence and interactions of Xilinx overall processes: Top level flow attached
DOCUMENTATION REQUIREMENTS	4.2	QAP0002, ISO9001, TS16949, TL9000	QAP0059
QUALITY MANUAL	4.2.2	ISO 9001, TS16949, QAP0002	
CONTROL OF DOCUMENTS CONTROL OF CUSTOMER SUPPLIED DOCUMENTS AND DATA	4.2.3 4.2.3.C.1	MIL-PRFC-38535	DCC0003, DPS0018 SCP0001, EAP0001, HPC0001, QAP0120, QAP0146
DATA CONTROL	4.2.4	ISO 9001, TS16949, TL9000	DCC0017
CONTROL OF QUALITY RECORDS	4.2.4		QAP0059

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
MANAGEMENT RESPONSIBILITY	5.0	QAP0002	
MANAGEMENT COMMITMENT	5.1	QAP0002	QAP0133, QAP0093
CUSTOMER FOCUS	5.2	QAP0002, ISO 9001:2000, TS16949,	QAP0133
CUSTOMER RELATIONSHIP DEVELOPMENT	5.2.C.1	TL9000	QAP0150
CUSTOMER COMMUNICATION PROCEDURE	5.2.C.2		QAP0150, EBC
QUALITY POLICY	5.3	QAP0002, ISO 9001:2000, TS16949,	
		TL9000	
PLANNING	5.4	QAP0002, ISO 9001:2000, TS16949,	QAP0133, Quality Leadership Web
		TL9000	page
QUALITY OBJECTIVES	5.4.1	QAP0002, ISO 9001:2000, TS16949,	QAP0133, QAP0034, QAP0062,
	5.4.1.C.1	TL9000	QAP0151, QCP0051
QUALITY MANAGEMENT PLANNING	5.4.2		Quality Leadership Web page, OPM,
LONG AND SHORT TERM QUALITY PLANNING	5.4.2.C.1		Q101
	5.4.2.C.2		
	5.4.2.C.3		
CUSTOMER INPUT	5.5	QAP0002, ISO9001, TS16949, TL9000	QAP0150, Customer Input (MRL, EBC,
			Quality Initiative), Six Months Business
SUPPLIER INPUT	5.5.1		Review (Fab. and Assembly),
	5.5.2		
RESPONSIBILITY, AUTHORITY, and	5.5.3		Takes place in Quarterly Review
COMMUNICATION	5.5.3.C.1		Meetings, Published on Bulletin Boards
RESPONSIBILITY AND AUTHORITY			and Intranet
MANAGEMENT REPRESENTATIVE			
INTERNAL COMMUNICATION			
ORGANIZATION PERFORMANCE FEEDBACK			

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
MANAGEMENT REVIEW RESOURCE MANAGEMENT	5.6 6.0	QAP0002, ISO9001:2000, TS16949 QAP0002, ISO 9001:2000, TS16949, TL9000	DPS0021, QAP0093, QAP0133
PROVISION OR RESOURCES	6.1	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0133
HUMAN RESOURCES	6.2	QAP0002, ISO 9001:2000, TS16949, TL9000 , Human Resources Website	QAP0013, EMS0024
COMPETENCE, AWARENESS AND TRAINING	6.2.2	QAP0002, ISO 9001:2000, TS16949, TL9000, Human Resources Website	QAP0013, QAP0064, Quality 101, Quality Systems Training, Competency Models, Oracle OTA
INTERNAL COURSE DEVELOPMENT	6.2.2.C.1		Quality 101: Quality Systems Training , SPC, Problem Solving, Design for Experiments
QUALITY IMPROVEMENT CONCEPTS	6.2.2.C.2		
TRAINING REQUIREMENTS AND AWARENESS	6.2.2.C.3		
ESD TRAINING	6.2.2.C.4		QAP0003
ADVANCED QUALITY TRAINING	6.2.2.C.5		SAF0007, OJT Training (XSJ), SAF0019, SAF0021, EMS0024
TRAINING CONTENT	6.2.2.C.6		QAP0064, QAP0013
OPERATOR QUALIFICATIONS	6.2.2.HV.1		EMS0001, EMS0006, EMS0050, EMS0015, SAF0022, SAF0014, EMS0004, MAC0029, TRP0001. QAP0137
INFRASTRUCTURE/ WORK ENVIRONMENT	6.3, 6.4	QAP0002, ISO 9001:2000, TS16949, TL9000	
WORK AREAS	6.4.C.1		
PRODUCT REALIZATION	7.0	QAP0002, ISO 9001:2000, TS16949, TL9000	DPS0021, SCP0002, PCC0001, HPC0001, MAC0062, QAP0034, PCC0029, IVC0051
PLANNING OF PRODUCT REALIZATION	7.1	QAP0002, ISO 9001:2000, TS16949, TL9000, MIL-PRF-38535, MIL-STD- 883, QAP0002	DPS0021, QAP0152, DPS0021, QAP0152 BCP0001-0086, SAF0020, Incident Management Action Guide (XSJ)
LIFE CYCLE MODEL	7.1.C.1		QAP0009, QAP0135, QAP0059, DPS0018, SCP0002 DPS0021
NEW PRODUCT INTRODUCTION	7.1.C.2		
DISASTER RECOVERY	7.1.C.3		
END OF LIFE PLANNING	7.1.C.4		
CONFIGURATION MANAGEMENT PLAN	7.1.HS.1		

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
CUSTOMER RELATED PROCESSES	7.2	QAP0002, ISO 9001:2000, TS16949, TL9000	
DETERMINATION OF REQUIREMENTS RELATED TO THE PRODUCT	7.2.1	QAP0002, ISO 9001:2000, TS16949, TL9000, QML	SCP0002, SCP0001, CUS0002, CUS0007, DPS0021
REVIEW OF REQUIREMENTS	7.2.2	QAP0002, ISO 9001: 2000, TS16949, TL9000, QML	CUS0007, SCP0001, SCP0002
CUSTOMER COMMUNICATION	7.2.3	QAP0002, ISO 9001:2000, TS16949, TL9000,	QAP0009, QAP0069, QAP0150,
NOTIFICATION ABOUT PROBLEMS	7.2.3.C.1		QAP0060, QAP0009 – CUS0027
PROBLEM SEVERITY	7.2.3.C.2		SPW, Xilinx.com, Customer Hotline
PROBLEM ESCALATION	7.2.3.C.3	EXCLUSION, (Not required for Component Category)	QAP0060, QAP0146, QAP0136
CUSTOMER FEEDBACK	7.2.3.C.4		QAP0060, QAP0067, QAP0069, QAP0146
ORGANIZATIONS RECALL PROCESS	7.2.3.H.1		QAP0060, QAP0146, QAP0118
DESIGN AND DEVELOPMENT	7.3	QAP0002, ISO 9001:2000, TS16949, TL9000	
DESIGN AND DEVELOPMENT PLANNING	7.3.1	QAP0002, ISO 9001:2000, TS16949, TL9000	DPS0021
PROJECT PLAN	7.3.1.C.1		PDD, SRB
REQUIREMENTS TRACABILITY	7.3.1.C.2		PDD, SRB
TEST PLANNING	7.3.1.C.3		FPGA: TSP0068, TSC0620, TSC0073, PDD
			CPLD: TSP0059, TSP0099, DPS0021
INTEGRATION PLANNING	7.3.1.S.1	EXCLUSION (Software requirement)	CSD: TSP00058
DESIGN AND DEVELOPMENT INPUTS	7.3.2	QAP0002, ISO 9001:2000, TS16949, TL9000	DPS0021
CUSTOMER AND SUPPLIER INPUT	7.3.2.C.1		SRB Phase 0, PDD (Product Design Document)
DESIGN AND DEVELOPMENT REQUIREMENTS	7.3.2.C.2		PDD, PDS
CONTENT OF REQUIREMENTS	7.3.2.H.1 (a & c)		Data Sheet, MAC0029, B) NOT APPLICABLE
DESIGN AND DEVELOPMENT OUTPUTS	7.3.3	QAP0002, ISO 9001:2000, TS16949, TL9000	DPS0021
DESIGN AND DEVELOPMENT REVIEW	7.3.4		DPS0021
DESIGN AND DEVELOPMENT VERIFICATION	7.3.5	QAP0002, ISO 9001:2000, TS16949	DPS0021
DESIGN AND DEVELOPMENT VALIDATION	7.3.6	QAP0002, ISO 9001:2000, TS16949, AEC-Q100	DPS0021, QAP0034

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
CONTROL OF DESIGN AND DEVELOPMENT CHANGES	7.3.7	QAP0002, ISO 9001:2000, TS16949	DPS0021
CHANGE MANAGEMENT PROCESS	7.3.7.C.1		DPS0015, Change Control Board
INFORMING CUSTOMERS	7.3.7.C.2		QAP0009
PROBLEM RESOLUTION CONFIGURATION MANAGEMENT	7.3.7.HS.1		SRB PROJECT MANAGEMENT, MMSI Control, Design Fixes
COMPONENT CHANGES	7.3.7.H.1		MSC1001
PURCHASING	7.4, 7.4.1, 7.4.2, 7.4.3	QAP0002, ISO 9001:2000, TS16949, TL9000	QCP0015, QAP0009, QAP0034, MSC1006 PSP0008, QCP0015, QAP0057, QAP0062, QCP0051
PURCHASING PROCEDURES	7.4.1.C.1	QAP0002	QAP0099, QCP0051, PSP0008, PSP0009, QAP0150, PSP0011, QAP0010, QAP0062, DPS0021, QCP0015, BCP, Quality Business Review
PRODUCTION AND SERVICE	7.5	QAP0002, ISO 9001:2000, TS16949, TL9000	
CONTROL OF PRODUCTION AND SERVICE	7.5.1		
ORGANISATION SUPPORT PROGRAM	7.5.1.C.1		QAP0146, Customer Training
SERVICE RESOURCES	7.5.1.C.2		HOTLINE
EMERGENCY SERVICE	7.5.1.HS.1		CUSTOMER SERVICE GROUP
INSTALLATION PLAN	7.5.1.HS.2		DATA BOOK / DATA SHEET CUSTOMER TRAINING

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
VALIDATION OF PROCESSES FOR PRODUCTION AND SERVICES OPERATIONAL CHANGES	7.5.2 7.5.2.HV.1		100% Test is Validation QAP0034, QAP0013, QAP0064
IDENTIFICATION AND TRACEABILITY	7.5.3	QAP0002, ISO 9001:2000, TS16949, TL9000, MIL-PRF-38535	PCC0001, MAC0062 IVC0048, MAC0011, MMSI, CXDB, TEST PROGRAMS
PRODUCT IDENTIFICATION	7.5.3.HS.1		
TRACEABILITY FOR RECALL	7.5.3.H.1	EXCLUSION (not applicable to component)	Component Recall:QAP0118
TRACEABILITY OF DESIGN CHANGES	7.5.3.H.2		MAC0011, IVC0015, DPS0015, XAMS, MMSI
CUSTOMER PROPERTY	7.5.4		EAP0001, HPC0001, QAP0120, QAP146,
PRESERVATION OF PRODUCT	7.5.5	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0003, IVC0031, IVC0035, MAC0029, MAC0002 QAP0003, TSP0007 QCP0044, IVC0051, IVC0031
ANTI-STATIC PROTECTION PACKAGING AND LABELING AUDIT	7.5.5.C.1 7.5.5.HS.1		
DETERIORATION	7.5.5.H.1		IVC0035
CONTROL OF MONITORING AND MEASURING DEVICES	7.6	QAP0002, ISO 9001:2000, TS16949, TL9000, ANSI/NCSI/NCSL ZX540-1- 1994	QAP0015, QAP0062, TSC0073, TSP0058, TSP0059, TSP0068
IDENTIFIED EQUIPMENT	7.6.H.1		QAP0015

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
MEASUREMENT, ANALYSIS, AND IMPROVEMENT	8.1	QAP0002, IOS9001:2000, TS16949, TL9000	QAP0126, DPS0021, QAP0034
MONITORING AND MEASUREMENT	8.2	QAP0002, ISO 9001:2000, TS16949, TL9000	
CUSTOMER SATISFACTION CUSTOMER SATISFACTION DATA	8.2.1 8.2.1.C.1	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0150, QAP0133 CUSTOMER SCORECARDS, QL, Web Support
INTERNAL AUDIT	8.2.2	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0056
MONITORING AND MEASUREMENT OF PROCESSES MONITORING AND MEASUREMENT OF PROCESSES	8.2.3 8.2.3.C.1	QAP0002, ISO 9001:2000, TS16949, TL9000 AEC-Q001, AEC-Q002	QAP0056, QAP0133 DPS0021, QAP0126, QAP0127, DPS0021: Design phase completion hand off, SRB, FAB YIELD, ASSEMBLY SPC
MONITORING AND MEASUREMENT OF PRODUCT INSPECTION AND TEST DOCUMENTATION INSPECTION AND TEST RECORDS PERIODIC RETESTING CONTENT OF TESTING FREQUENCY OF TESTING TESTING OF REPAIR AND RETURN PRODUCTS	8.2.4 8.2.4.HV.1 8.2.4.HV.2 8.2.4.H.1 8.2.4.H.2 8.2.4.H.3 8.2.4.H.4	QAP0002, ISO 9001:2000, TS16949, TL9000 Same as 8.2.4 EXCLUSION – REPAIR Not applicable for component	DSP0021, TSC0073, TSP0007, TSP0035, TSP0037, TSP0068, QAP0014, QAP0126, QAP0127, QAP0149, QCP0008, PCC0001, PCC0029, MAC0062 Same as 8.2.4 QAP0034 Quarterly Monitors QAP0034 RETURN PRODUCT – RMA PROCESS
CONTROL OF NON-CONFORMING PRODUCT	8.3	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0014, QAP0060, QCP0008
ANALYSIS OF DATA TREND ANALYSIS OF NON-CONFORMING PRODUCT FIELD PERFORMANCE DATA	8.4 8.4.C.1 8.4.H.1	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0014, QAP0069, QAP0060, QAP0133, QAP0149, TSP0007 QAP0120, QAP0067, Customer Hotline

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XILINX DOCUMENTS CROSS REFERENCE TABLES (continued)

GENERAL REQUIREMENT	ISO 9001: 2000 TL9000 TS16949	XILINX REFERENCE SPECIFICATIONS	XILINX REFERENCE SPECIFICATIONS Level 2
IMPROVEMENT	8.5	QAP0002, ISO 9001:2000, TS16949, TL9000	
CONTINUAL IMPROVEMENT QUALITY IMPROVEMENT PROGRAM EMPLOYEE PARTICIPATION	8.5.1 8.5.1.C.1 8.5.1.C.2	QAP0002, ISO 9001:2000, TS16949, TL9000,	QAP0133, QAP0159 OPM QAP0013, Q101, QL Bonus, Rewards, Medallions
CORRECTIVE ACTION	8.5.2	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0014, QAP0133
PREVENTIVE ACTION	8.5.3	QAP0002, ISO 9001:2000, TS16949, TL9000	QAP0014, QAP0059

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TABLE OF CONTENTS AND CROSS REFERENCE TO SOFTWARE DESIGN AND DEVELOPMENT SPECIFICATIONS

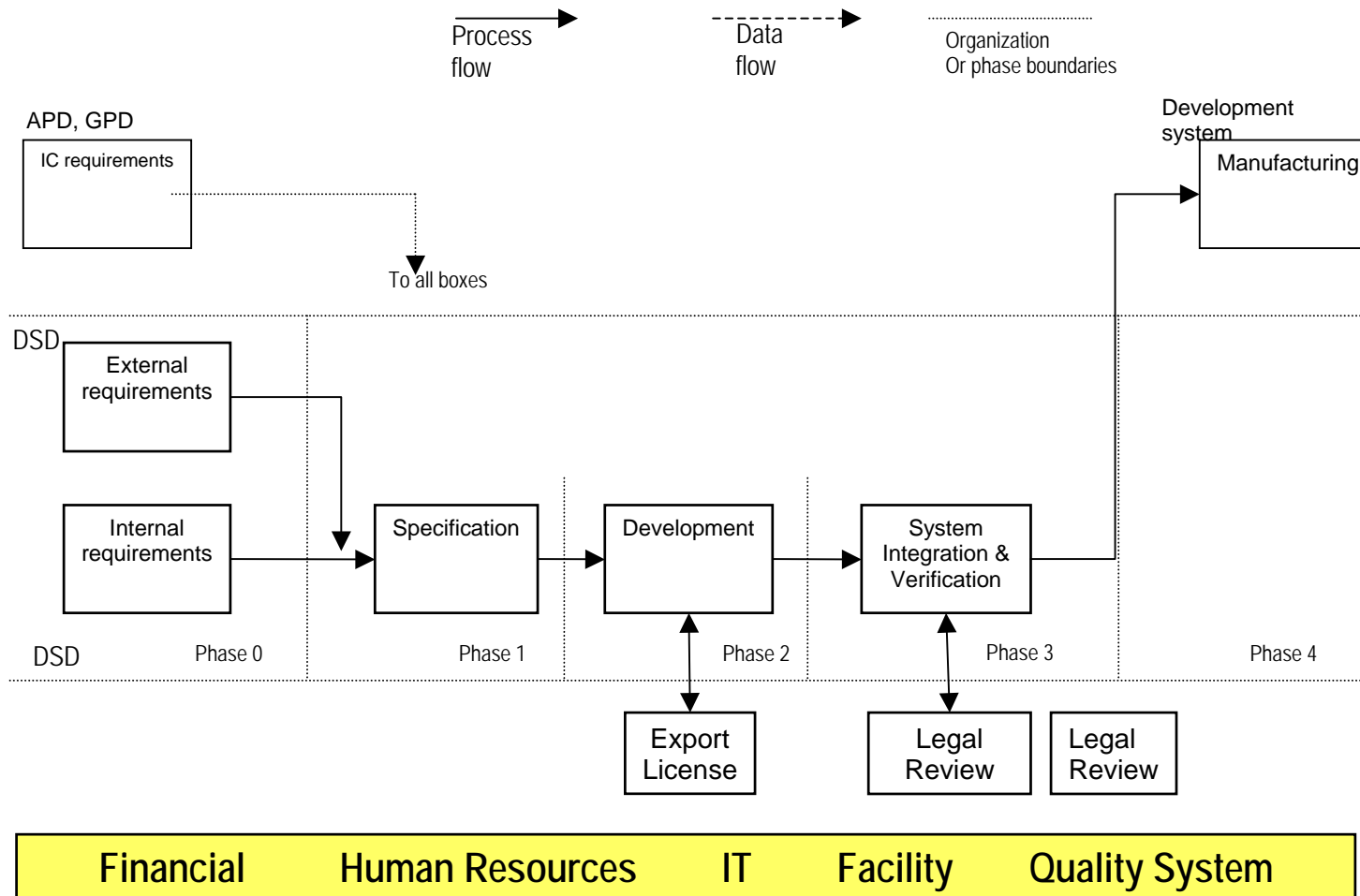
DSD controls the following Release documents:

Document	Database or document name	Control procedure	Approval chain (see control procedure for details. See note 1)
High Level Process Diagram	http://web/randd/software/program_management/ISO/HLP.html		
Release Requirements	http://ris	Control policy Change Control procedure	Under control: PRT->RCB.
Product Functional Specs	http://web/randd/XSPEC	Change Control procedure	PRT->RCB
System Test Plans	STAT tool for Halite. Start with RIS for other releases.	Test plans are controlled by PRTs, ask Rick or Dennis.	PRT
Release Process Documents	http://web/randd/software/program_management/xsp	Send email to schedule_mtg	Schedule_mtg
Source Code	XCS database	Control policy Change Control procedure	PRT->RCB
Released data files	XCS database	Control policy Change Control procedure	PRT->RCB
Software Documentation	XCS database	Change Control procedure	PRT->RCB
Subsystem build scripts and files	XCS database	Change Control procedure	
Software Defect Reports and Change Requests	Clarify database	Clarify documents Change Control procedure	PRT->RCB
Release Plan and Schedule	Schedule Tool	Czars: edit the tentative schedule and notify schedule_mtg. All others: email schedule_mtg	Czar->Schedule Meeting
Build Environment		Change Control procedure	BATON->RCB.

APPENDIX B: Design Software Division Process Maps

B1. Software Development Release Process Map

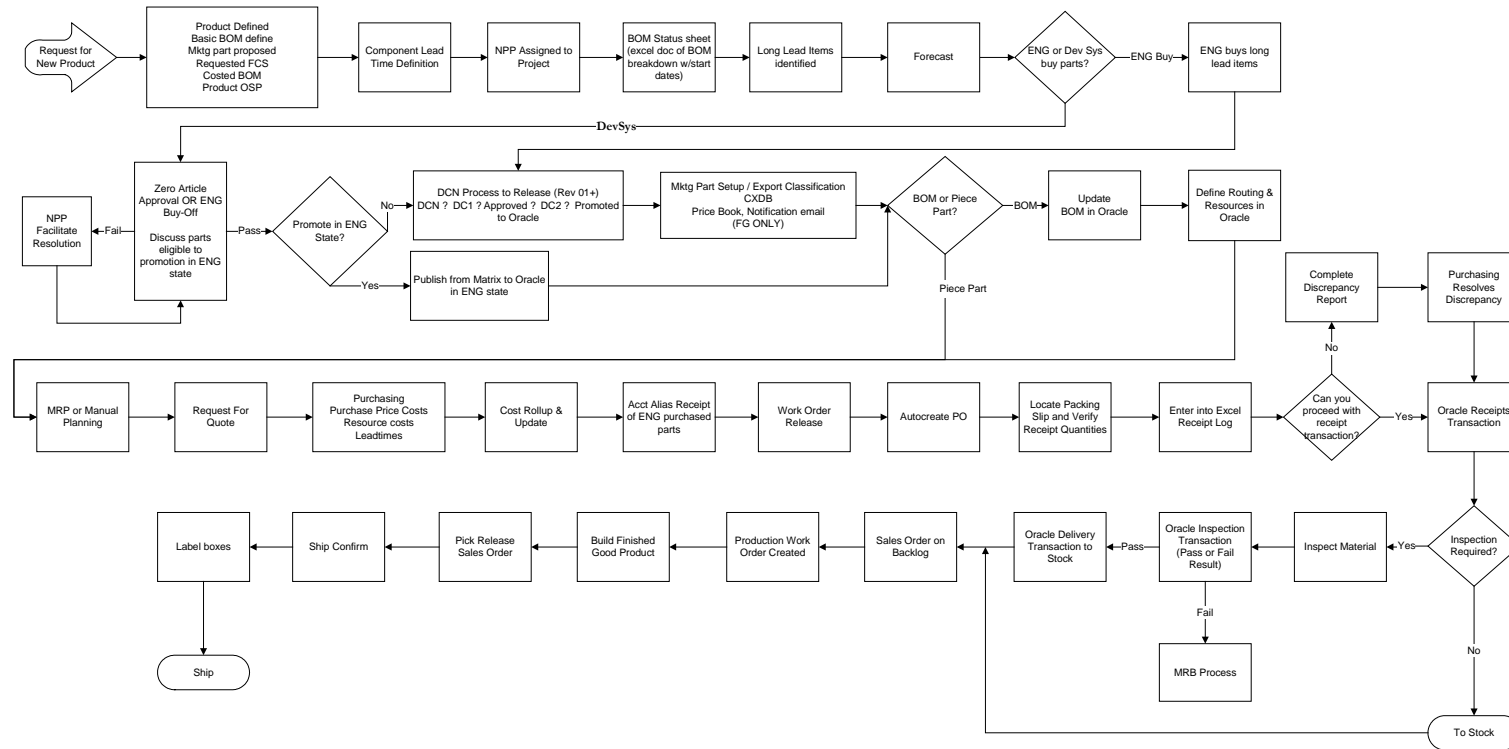
DSD High Level Process



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B2. Development System Process Map (Software Manufacturing)

Development Systems Process Map



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APPENDIX C: REFERENCED DOCUMENTS

- ISO-9001: 2000: Quality Management Systems
- TL9000: Quality Management System Requirements Handbook
- TL9000: Quality Management System Measurements Handbook
- Mil-Prf-38535 Part Manufacturers And Service Providers for Integrated Circuits
- Advanced Product Quality Planning (APQP) AIAG manual
- Production Part Approval Process (PPAP) AIAG manual
- Measurement System Analysis (MSA) AIAG manual
- Failure Mode and Effects Analysis (FMEA) AIAG manual
- ISO/TS16949: 2002
- Other documents are referenced in the table of contents of Appendix-A

APPENDIX D: DESIGN SERVICES PROCESS MAP

