Comparison of Requirements
ISO/TS 16949:2001 vs. ISO/TS 16949:1999 & QS-9000

"A Road Map to 21st Century Automotive Quality," Table 1

by Radley M. Smith

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
INTRODUCTION					
Process Approach	0.2	None	None	New (ISO 9001:2000)	**RETHINK ENTIRE QMS**
Relationship with ISO 9004*	0.3	None	None	New (ISO 9001:2000)	No new requirements
Compatibility with Other Management Systems (ISO 14001)	0.4	None	None	New (ISO 9001:2000)	No new requirements
Goal of this Technical Specification — QMS Continuous Improvement	0.5	4.1.1.4	4.2.5	Same (as 1999 edition)	**New: Continually improve QMS**
SCOPE					
Scope—General	1.1	None	None	New (ISO 9001:2000)	No new requirements
Application (exclusions)	1.2	None	None	New (ISO 9001:2000)	No new requirements
NORMATIVE REFERENCE	2	2	None	New (ISO 9001:2000)	No new requirements
TERMS AND DEFINITIONS	3	3; Annex A	Glossary	New (ISO 9001:2000)	No new requirements
QUALITY MANAGE-MENT SYSTEM					
General Requirements	4.1	4.2.1	4.2.1	New (ISO 9001:2000)	**New: Continually improve QMS; determine sequence and interaction of QMS processes**
Documentation Requirements—General	4.2.1	4.2.2	4.2.2	Same	No change
Documentation Requirements	4.2.1	4.2.1	4.2.1	Same	No change
Quality System Procedures	4.2.2 Note	4.2.2.2	4.2.2	New (TS 16949:1999)	**All requirements of standard to be addressed in QMS documentation**
Quality Manual	4.2.2	4.2.1	4.2.1	New (ISO 9001:2000)	**New: Describe interaction of process**
Control of Documents	4.2.3	4.5.1; 4.5.2; 4.5.3	4.5.1; 4.5.2; 4.5.3	Same	No change
Engineering Specifications	4.2.3.1	4.5.2.2	4.5.2.1	New (TS 16949:2002)	**New: The period for "timely review" is defined as not more than two working weeks**
Control of Records	4.2.4	4.16	4.16	Same	No change
Records Retention	4.2.4.1	4.16.2	4.16.1	Same	No change
MANAGEMENT RESPONSIBILITY					
Management Commitment	5.1	None	None	New (ISO 9001:2000)	**New: Management to provide evidence of commitment to QMS and its continual improvement**
Process Efficiency	5.1.1	None	5.1.1	New Requirement	**New: Management to monitor efficiency of product realization process**
Customer Focus	5.2	None	None	New (ISO 9001:2000)	**New: Management to pursue enhance-ment of customer satisfaction**
Quality Policy	5.3	4.1.1.1	4.1.1	Modified in ISO 9001:2000	**Modification: Policy to include commitment to continually improve QMS**
Planning—Quality Objectives + Supplemental	5.4.1; 5.4.1.1	4.1.1.1; 4.1.1.2	4.1.4 (business plan may include)	New (ISO 9001:2000); minor TS 16949 interpretation	**New: Establish quality objectives for relevant functions and levels; objectives to be measurable**
Quality Management System Planning	5.4.2	4.2.3.1a; 4.2.3.2 (expan.)	4.2.3a	Management responsible for ensuring QMS planning	Preparation of "quality plans" not specified
Responsibility, Authority and commun-ication—Responsibility and Authority	5.5.1	4.1.2.1.1	4.1.2	Simplification of earlier requirement	Documentation requirements removed, greater flexibility
Responsibility for Quality—Quality Responsible	5.5.1.1	4.1.2.1.1	4.1.2.1.1	Same	No change
Information to Management	5.5.1.1	4.1.2.1.3	4.1.2.5	Same	No change
Stopping Production for Quality Concerns	5.5.1.1	4.1.2.1.3	Note to 4.1.2.1.a recommends	Same	No change
Shift Resources	5.5.1.1	4.1.2.2.2 (expansion)	None	Same	**Modification: May require Quality personnel on all shifts**

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Management Representative	5.5.2	4.1.2.3	4.1.2.3	New (ISO 9001:2000)	**New: Representative to ensure promotion of awareness of customer requirements**
Customer Representative	5.5.2.1	4.1.2.1.2	None	New Requirement	**New: Management to designate individual(s) to represent customer needs on QMS requirements**
Internal Communication	5.5.3	None	None	New (ISO 9001:2000)	**New: Management to ensure internal communication processes are created and used to address QMS effectiveness**
Registrar Notification	**None**	None	4.1.6.1	**Not Required**	Requirement that registrar is notified of an OEM "downgrade" of supplier's status not specified
Management Review	5.6.1	4.1.3.1 (partially new)	4.1.3; 4.1.3.1	New (ISO 9001:2000)	**Expanded: Review to include QMS improvement opportunities and need for changes**
Quality Management System Performance	5.6.1.1	4.1.3.2; 4.1.5; 4.2.8	4.1.3.1; 4.1.5	Both editions go beyond QS-9000 "company level data" requirement	**New: Review evidence of achievement of quality policy, business plan objectives and customer satisfaction;** benchmarking and competitive data comparisons not specified
Review Input	5.6.2	None	None	New (ISO 9001:2000)	**New: Specifies information on sources to be included as inputs**
Review Input—Supplemental	5.6.2.1	4.14.2.3	4.14.2.1	Derived from QS-9000	**New: Analysis of actual and potential field failures and effect on quality, safety or environment to be input**
Review Output	5.6.3	None	None	New (ISO 9001:2000)	**New: Specifies information on sources to be included as outputs**
RESOURCE MANAGEMENT					
Provision of Resources	6.1	4.1.2.2.1	4.1.2.2	New (ISO 9001:2000)	**New: Provide resources for continual improvement of QMS effectiveness**
Human Resources—General	6.2.1	None	None	New (ISO 9001:2000)	**New: Personnel to be competent based on education, training, skills, experience**
Competence, Awareness and Training	6.2.2	4.18.1; 4.18.2	4.18; 4.18.1	ISO 9001:2000 adopts QS-9000 requirement for training effectiveness	**New: Actions besides training may be needed; personnel to be aware of the importance of their activities and contributions to meeting quality objectives**
Product Design Skills	6.2.2.1	4.4.2.2	4.4.2.1	Less specific than 1999 edition requirements	No change; list of required skills is deleted—organization must determine what skills are required
Training	6.2.2.2	4.18.1; 4.18.2	4.18; 4.18.1	Same (as 1999 edition)	Limits application to personnel affecting product quality; deletes note on review methods
Training on the Job	6.2.2.3	4.18.3	None	Same	**New: Provide OJT for personnel in new/ modified jobs affecting product quality**
Employee Motivation and Empowerment	6.2.2.4	4.1.6	None	Expansion of 1999 edition	**New: Process to motivate quality objective achievement, continual improvements and environment for innovation, with measurement process**
Infrastructure	6.3	4.1.2.2.1	4.1.2.2	Semantics only	ISO 9001:2000 adopts QS-9000 additional requirements
Plant, Facility and Equipment Planning	6.3.1	4.2.5	4.2.6	Deletes 6 factors	No change; note recommends lean manufacturing focus instead of effectiveness metrics
Contingency Plans	6.3.2	4.9.1.3	4.9.b.2	"Field returns" added	No longer excludes natural disasters
Work Environment	6.4	None	None	Semantics only	No change; summarizes QS-9000 additional requirements
Personnel Safety	6.4.1	4.1.7.1	4.2.3.4	Deletes recommended internal safety awareness	No change
Cleanliness of Premises	6.4.2	4.9.1.2	4.9.b.1	Same	No change
PRODUCT REALIZATION					
Planning of Product Realization + Supplemental	7.1; 7.1.1	4.2.3.1; 4.2.4.1; 4.10.1.1	4.2.3.1; 4.10.1	Expands on 1999 edition	**New: Quality objectives to be determined for product**
Acceptance Criteria	7.1.2	4.10.1.2	4.10.1.1	Requires defined, not documented criteria	No change
Confidentiality	7.1.3	None	4.4.11	New (from QS-9000)	No change

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Change Control	7.1.4	4.4.9.1; 4.4.9.2	4.4.9; 4.4.9.1; 4.4.9.2	Expands on 1999 edition (see also 7.3.7)	Expands to require processes to control and react to changes affecting product realization
Customer-Related Processes—Determination of Requirements Related to Product	7.2.1	4.3.2.1; 4.4.4.1	4.3.2; 4.4.4	Expands on 1999 edition	**New: Requirements not stated by customer but necessary to be determined**
Customer-Designated Special Characteristics	7.2.1.1	4.2.4.7	4.2.3.2	Generic requirement to meet customer requirements	No change
Review of Requirements Related to the Product	7.2.2	4.3.2.1	4.3.2	Expands on 1999 edition	No change; ISO 9001:2000 note refers to review of Internet situations
Organization Manufacturing Feasibility	7.2.2.1	4.2.4.8	4.2.3.3	Adds risk analysis	**New: Must document feasibility and include risk analysis**
Customer Communication	7.2.3	None	None	New (ISO 9001:2000)	**New: To have process to communicate with customer**
Customer Communication—Supplemental	7.2.3.1	4.2.4.6 (Partially new)	4.4.4.1	Less specific than 1999 edition on CAD applicability	No change
Design and Development—Design and Development Planning	7.3.1	4.4.2.1	4.4.2	Deletes list of required skills	No change
Multidisciplinary Approach	7.3.1.1	4.2.4.4	4.2.3.7	Both editions expand the QS-9000 requirement	**New (minor): Use approach to determine SCs and develop FMEAs as well as control plans**
Design and Development Inputs	7.3.2	4.4.4.1	4.4.4	Adds list of inputs	**New: Lists inputs to be included**
Product Design Input	7.3.2.1	4.4.4.2; 4.4.4.3	None	Expands on 1999 edition	**New: Inputs to be identified, documented and reviewed**
Manufacturing Process Design Input	7.3.2.2	4.2.4.9.2	None	New requirement in 1999 edition	**New: Identify, document and review the identified inputs**
Special Characteristics	7.3.2.3	4.2.4.7	4.2.3.2	Same	No change
Design and Development Outputs	7.3.3	4.4.5.1	4.4.5	Adds requirement	**New: Appropriate information to purchasing, production and for service provision**
Product Design Outputs—Supplemental	7.3.3.1	4.4.5.2	4.4.5.1	Rewritten	No change
Manufacturing Process Design Output	7.3.3.2	4.2.4.9.3	4.2.3.1; 4.2.3.5; 4.2.3.6	Rewritten	**New: Specific outputs to be included**
Design and Development Review	7.3.4	4.4.6	4.4.6	Rewritten; note added	Design reviews should include manufacturing process design and development
Monitoring	7.3.4.1	None	None	New requirement	**New: Measurements at specified stages to be management review input**
Design and Development Verification	7.3.5	4.4.7	4.4.7	Same	No change
Design and Development Validation + Supplemental	7.3.6; 7.3.6.1	4.4.8.1; 4.4.8.2	4.4.8	Expanded in 1999 edition	**New: To be conducted to customer requirements (e.g., program timing)**
Prototype Programme	7.3.6.2	4.4.8.3	4.4.10	Same	No change
Product Approval Process	7.3.6.3	4.2.4.11	4.2.4	QS-9000 recommendation now requirement	**New: PPAP to be applied to suppliers**
Control of Design and Development Changes	7.3.7	4.4.9	4.4.9; 4.4.9.1; 4.4.9.2	Same	No change
Purchasing—Purchasing Process	7.4.1	4.6.1.1; 4.6.2.2	4.6.1; 4.6.2	Adds note in line with IASG Interpretations	Note adds verification of supplier system if its ownership changes
Regulatory Compliance	7.4.1.1	4.6.1.3	4.6.1.2	Same	No change
Supplier Quality Management System Development	7.4.1.2	4.6.2.2	4.6.2.1	Changed into new requirement	**New: Suppliers to be registered to ISO 9001:2000 and comply with TS, but customer may mandate alternatives**
Customer-Approved Sources	7.4.1.3	4.6.1.2	4.6.1.1; 4.6.2.1	Same	No change
Purchasing Information	7.4.2	4.6.3	4.6.3	Same	No change
Verification of Purchased Products	7.4.3	4.6.4.1; 4.6.4.2; 4.10.2	4.6.4.1; 4.6.4.2; 4.10.2	Simplified per ISO 9001:2000	No change; deletes specified requirements for release for urgent production
Incoming Product Quality	7.4.3.1	4.10.2.4	4.10.2.4	Option added by 2002 edition	**New: Customer may specify alternative methods**
Supplier Monitoring	7.4.3.2	4.6.2.3	4.6.2.2	Expands QS-9000 required monitoring	**New: Performance to be monitored by indicators beyond delivery performance**
Production and Service Provision—Control of Production and Service Provision	7.5.1	4.9.1.1	4.9	Same	No change
Control Plan	7.5.1.1	4.2.4.10	4.2.3.7	Rewritten	No change
Work Instructions	7.5.1.2	4.9.2	4.9.1	Deletes list of items to be included	No change
Verification of Job Set-ups	7.5.1.3	4.9.4	4.9.4	Same	No change

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Preventive and Predictive Maintenance	7.5.1.4	4.9.1.5	4.9.g.1	Removes information on predictive maintenance methods	No change
Management of Production Tooling	7.5.1.5	4.2.6	4.2.6.2	1999 edition added a tool identification requirement, including status	**New: Tool identification to be covered by tooling management system**
Production Scheduling	7.5.1.6	4.15.6.3	4.15.6.2	Rewritten	No change
Feedback of Information from Service	7.5.1.7	4.19.2	4.19.1	Same	No change
Servicing Agreement With Customer	7.5.1.8	4.19.3	None	1999 edition added new subclause	**New: Effectiveness in servicing customer to be verified if servicing agreement exists**
Validation of Processes for Production and Service Provision + Supplemental	7.5.2; 7.5.2.1	4.9.1.1	4.9	ISO 9001:2000 specifies arrangements to be established; 2002 edition expands applicability	**New: Validation to apply to all processes, not just those that cannot be verified by monitoring and measurement**
Identification and Traceability + Supplemental	7.5.3; 7.5.3.1	4.8	4.8	Same	No change
Customer Property	7.5.4	4.7.1	4.7	Same	Documentation of procedures not required
Customer-Owned Production Tooling	7.5.4.1	4.7.2	4.7.1	Same	No change
Preservation of Product	7.5.5	4.15	4.15	Covers ISO 9001:1994 Clause 4.15	No change
Storage and Inventory	7.5.5.1	4.15.3.1; 4.15.3.2	4.15.3; 4.15.3.1	Repeats 4.15.3 of ISO 9001:1994	No change
Control of Monitoring and Measuring Devices	7.6	4.11.1.1; 4.11.2	4.11.1; 4.11.2	Simplified language in 2002 edition	No change
Measurement System Analysis	7.6.1	4.11.1.2	4.11.4	Does not refer to MSA manual in either edition	No change
Calibration Records	7.6.2	4.11.3	4.11.3	2002 adds items to be included in records	**New: Records to include equipment identification, revisions following engineering changes and assessment of out-of-specification impacts**
Laboratory Requirements— Internal Laboratory	7.6.3.1	4.10.6	4.10.6	Rewritten	No change
External Laboratory	7.6.3.2	4.10.6	4.10.7	Expanded	**New: Lab to be accredited to ISO/IEC 17025 or acceptable via customer-approved 2nd-party audit**
MEASUREMENT, ANALYSIS AND IMPROVEMENT					
General	8.1			New (ISO 9001:2000)	**New: Organization to plan and implement the processes needed**
Identification of Statistical Tools	8.1.1	4.20.3	4.20.3	Same	No change
Knowledge of Basic Statistical Concepts	8.1.2	4.20.4	4.20.4	Added (ISO 9001:2000)	**New: Concepts to be used as well (as "understood") throughout the organization**
Monitoring and Measurement— Customer Satisfaction + Supplemental	8.2.1; 8.2.1.1	4.1.1.3; 4.1.5	4.1.5; 4.1.6	Expanded (ISO 9001:2000)	**New: Methods and monitor customer perception of quality**
Internal Audit	8.2.2	4.17.1	4.17	Clarification (ISO 9001:2000)	**New: Auditor not to audit his/her own work; otherwise, no change**
Quality Management System Audit	8.2.2.1	4.17.2.2	4.17	Added to account for ISO 9001:2000	**New: Audit must verify QMS compliance with TS 16949:2002**
Manufacturing Process Audit	8.2.2.2	4.17.2.3	None	New requirement in 1999 edition	**New: Audit each manufacturing process for effectiveness**
Product Audit	8.2.2.3	4.17.2.4	4.10.2.4;	1999 edition expanded QS-9000 requirement	**New: Audits to include in-process as well as final product audit**
Internal Audit Plans	8.2.2.4	4.17.2.1; 4.17.2.2	4.17.1	Expanded (IASG Interpretations and 1999 edition)	**New: Audits must cover all shifts and QMS activities per an annual schedule**
Internal Auditor Qualification	8.2.2.5	4.17.3	None	Modification of 1999 edition requirement	**New: Auditors to be qualified to audit against TS 16949:2000**
Monitoring and Measurement of Processes	8.2.3	None	None	New (ISO 9001:2000)	**New: Monitor and/or measure effectiveness of QMS processes and take corrective action to ensure product conformity**
Monitoring and Measurement of Manufacturing Processes	8.2.3.1	4.9.3	4.9.2	Same	No change
Monitoring and Measurement of Product	8.2.4	4.10.2; 4.10.3; 4.10.4	4.10.2; 4.10.3; 4.10.4	Rewritten; expanded (ISO 9001:2000)	**New: Records to indicate who authorized release**
Layout Inspection and Functional Testing	8.2.4.1	4.10.4.2	4.10.4.1	Same	No change

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Apperance Items	8.2.4.2	4.9.5	4.9.6	Same	No change
Control of Nonconforming Product + Supplement	8.3; 8.3.1	4.13.1.1; 4.13.1.2; 4.13.2	4.13.1; 4.13.2	Simplified (ISO 9001:2000)	Need to document and segregate nonconformity product not specified
Control of Reworked Product	8.3.2	4.13.3	4.13.3	Simplified (2002 edition)	Prohibition of rework visibility not specified
Customer Information	8.3.3	None	None	New (ISO 9001:2000)	**New: Customer to be alerted if nonconforming product was shipped**
Customer Waiver	8.3.4	4.13.4	4.13.4	Same	No change
Analysis of Data	8.4	4.20.1; 4.20.2	4.20.1; 4.20.2	New (ISO 9001:2000)	**New: Collect and analyze data to verify QMS suitability and effectiveness and evaluate improvement opportunities; lists what analysis will relate to**
Analysis and Use of Data	8.4.1	4.1.5	4.1.5	Expanded (1999 edition)	**New: Trends to support information system to report data from product usage**
Improvement— Continual Improvement	8.5.1	4.1.1.4; 4.1.3.2	4.2.5	ISO 9001:2000 modification of QS-9000	**New: QMS effectiveness to be continually improved through various QMS elements**
Continual Improvement of the Organization	8.5.1.1	None	None	New (ISO 9001:2000)	**New: Process for continual improvement of organization to be defined**
Manufacturing Process Improvement	8.5.1.2	4.2.7	4.2.5.1: 4.2.5.2	Modified	**New: Focus to be on control and reduction of variation;** deletes references to improvement in cost, delivery, timing
Corrective Action	8.5.2	4.14.1.1; 4.14.2.1	4.14.1; 4.14.2	Rewritten (ISO 9001:2000)	No change
Problem Solving	8.5.2.1	4.14.1.2	4.14,1.1	Modified (1999 edition)	**New: Customer-prescribed format to be used if one exists**
Error-Proofing	8.5.2.2	4.14.1.3	4.14.1.2	Minor change	Applying methods "to the degree appropriate" not mentioned
Corrective Action Impact	8.5.2.3	4.14.2.2	4.14.2.2	Same	No change
Rejected Product Test/Analysis	8.5.2.4	4.14.2.3	4.14.2.1	Modified (1999 edition)	**New: Cycle time (of analysis) to be minimized**
Preventive Action	8.5.3	4.14.3	4.14.3	Rewritten for clarity (ISO 9001:2000)	No change

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*0.3.1, IATF Guidance to ISO/TS 16949:2002, refers users to a document of the same title developed by the IATF along with ISO/TS 16949:2002 to provide assistance to suppliers on applying the second edition of this TS.

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