

TL 9000 Release 3 to Release 4 Deltas

January 31, 2007

TL 9000 Section per 3.0	TL 9000 Section per 4.0	Comments
New	<p>3.1 Registration Scope – Organizations may consider TL 9000 additional requirements for exclusion outside of clause 7 if the TL 9000 additional requirements cannot be applied by the organization. If the organization has responsibility for the process then the requirement shall not be excluded.</p>	<p>This is big! Organizations have struggled to comply with some adders of TL outside of section 7 that were not a fit for them. This paragraph now gives the organization permission to exclude those adders for which they do not have responsibility.</p>
<p>4.2.3.C.1 Control of Customer-Supplied Documents and Data – The organization shall establish and maintain a documented procedure(s) to control all customer-supplied documents and data (e.g., network architecture, topology, capacity, installation termination assignments, drawings and database) if these documents and data influence the design, verification, validation, inspection and testing, or servicing the product.</p>	<p>4.2.3.C.1 Control of Customer-Supplied Documents and Data – The organization shall establish and maintain a documented procedure(s) to control all customer-supplied documents and data (e.g., network architecture, topology, capacity, installation termination assignments, drawings and database) if these documents and data influence the <i>realization and/or support of the product</i>.</p>	<p>The intent remains the same. The wording has changed slightly.</p>
<p>5.2.C.2 Customer Communication Procedures – The organization shall establish and maintain a documented procedure(s) for communicating with selected customers. The documented procedures shall include: a) a strategy and criteria for customer selection b) a method for the organization to share joint expectations and improve the quality of product, and c) a joint review with the customer at defined intervals covering the status of shared expectations and including a method to track the resolution of issues.</p>	<p>5.2.C.2 Customer Communication Methods – The organization shall establish and maintain <i>methods</i> for communicating with selected customers to share expectations, to solicit and consider customer inputs for quality planning activities, and to ensure product quality improvement. The outcome of customer communication should generate actions for resolving identified issues and provide opportunities for improving customer satisfaction.</p>	<p>A documented procedure is no longer required, but the organization must develop a “method” or a “process” for communicating with selected customers. The clause, the way it is rewritten gives direction for the “intended outcome” of this communication, rather than “defining” the</p>

		process the organization must use.
<p>5.4.2.C.1 Long- and Short-Term Quality Planning – The organization’s quality planning activities shall include long- and short-term plans with goals for improving quality and customer satisfaction. Performance to these goals shall be monitored and reported. These plans shall address:</p> <p>a) cycle time, b) customer service, c) training, d) cost, e) delivery commitments, and f) product reliability.</p>	<p>5.4.2.C.1 Long- and Short-Term Quality Planning – The organization’s quality planning activities shall include long- and short-term plans with goals for improving quality and customer satisfaction. <i>The plans shall address business factors relevant to the organization and its customers, including performance objectives established jointly with selected customers.</i> Performance to these goals shall be monitored and reported.</p> <p>5.4.2.C.1-NOTE 1 Example factors which might be considered for planning are a) cycle time, b) customer service, c) training, d) cost, e) delivery commitments, and f) product reliability.</p> <p>5.4.2.C.1-Note 2 Top Management should demonstrate their active involvement in long-and short-term quality planning.</p>	<p>Items that used to be required in a quality plan are now recommendations. This new wording directs the organization to develop those goals which are important, not only to the customer, but additionally to the business itself. The new “Note 2” reminds us that “Top Management” should be included in short and long term planning.</p>
New NOTE	<p>6.2.2 Competence, awareness and training - 6.2.2.C-Note – <i>Education and training needs may vary greatly depending on the nature of the organization’s activities, individual responsibilities, and the stage of organizational and personal development. Methods of delivery may include on-the-job training, cross-training, job rotation, classroom experience, computer-based training, distance learning, or other methods. Training may take place within the organization or be provided externally, and should be reinforced on the job.</i></p>	<p>This note expands on the ISO requirement and gives insight as to how the organization should judge the types of training to be delivered and methods of delivery.</p>
<p>6.2.2.C.1 Internal Course Development – When the organization develops internal training courses, it shall establish and maintain</p>	<p>6.2.2.C.1 Internal Course Development – <i>Where the organization is responsible for developing internal training courses, the organization shall</i></p>	<p>The intent here remains the same. If the organization develops</p>

<p>a process for planning, developing, and implementing these courses.</p>	<p><i>establish and maintain methods to ensure consistency in course planning, development and delivery</i></p>	<p>internal training a method should be in place to ensure the consistent quality in planning, development and delivery.</p>
<p>6.2.2.C.2 Quality Improvement Concepts – Those employees that have a direct impact on the quality of the product, including top management, shall be trained in the fundamental concepts of continual improvement, problem solving and customer satisfaction.</p>	<p>6.2.2.C.2 Quality and Process Improvement Concepts – Those employees that have a direct impact on the quality of the product, including top management, shall be trained in <i>and apply</i> the fundamental concepts of continual improvement, problem solving and customer satisfaction.</p>	<p>The new intent here is clear. It is not enough to just “train” employees, they also must apply that training in their jobs.</p> <p>In case, you didn’t get it before, quality improvements also include “process” improvements.</p>
<p>6.2.2.C.3 Training Requirements and Awareness – Training requirements shall be defined for all positions that have a direct impact on the quality of products. Employees shall be made aware of training opportunities.</p>	<p>6.2.2.C.3 Product Quality Training Opportunity Awareness – Where training that affects product quality is required, the organization <i>shall implement methods to ensure employees are enabled to participate. Methods should address</i> <i>a) communication of training opportunities, and</i> <i>b) availability of training.</i></p>	<p>Apparently, the original intent of this clause in V 3.0 was not made clear. We have gone from “defining training requirements,” which should be done as part of 6.2.2 anyway, and making employees “aware” of training opportunities, to implementing a method to “ensure” employees are able to participate.</p>
<p>6.2.2.C.6 Training Content – Where the potential for hazardous conditions exists, training content should include a) task execution, b) personal safety and appropriate protective equipment, c) awareness of hazardous environment, and</p>	<p>6.2.2.C.6 Hazardous Conditions Training Content – Where the potential for hazardous conditions exists, training content <i>shall</i> include a) task execution, b) personal safety and appropriate protective equipment, c) awareness of hazardous environment, and</p>	<p>This clause has always been about training for hazardous conditions and now it has been clarified by the change to the title. Additionally, the content “shall” include a-d.</p>

<p>d) equipment protection.</p>	<p>d) equipment protection.</p>	<p>Apparently, given the option, some organizations delivered hazardous training but failed to include the basics.</p>
<p>6.2.2.HV.1 Qualification of Personnel – The organization shall establish operator qualification and requalification requirements for all applicable processes. These requirements, at a minimum, shall address employee education, experience, training and demonstrated skills. The organization shall communicate this information to all affected employees.</p>	<p>6.2.2.HV.1 Qualification of Personnel – The organization shall establish personnel qualification and requalification requirements for all applicable processes. Qualification requirements shall address employee education, experience, training and demonstration of skills.</p> <p><i>6.2.2.HV.1-NOTE Examples of processes which may require personnel qualification and re-qualification include wire wrapping, soldering, welding and fiber-optic splicing.</i></p>	<p>Due to the addition of the note it is now appears that this requirement applies to “special” processes. Special processes are those where “the resulting output cannot be verified by subsequent monitoring and measurement.” Basically there is no way to inspect and test to ensure the product or service will not fail in the field, therefore you must ensure that the “process” is fool-proof and an important part of this is ensuring that operators are qualified and re-qualified. The requirement for communicating with employees regarding this training has been dropped. A thought, event though the note points to special processes, don’t you want to be assured that all of your operators are</p>

New	<p>6.3.C.1 Infrastructure – The organization shall identify critical areas of the infrastructure and provide for the security needed to protect these areas. Security restoration plans shall be developed and periodically assessed.</p>	<p>qualified?</p> <p>As we all know, times are not what they used to be. Telecommunications are vital for emergency response to disasters that affect the world and must therefore be prepared to recover immediately in the event a disaster strikes them. First, make sure you add extra security to those “critical” areas of your organization to prevent problems in the first place and then develop a plan for restoring your business if a disaster strikes. Where other standards require that you periodically assess or test, “where feasible,” you “shall” periodically assess your plans and don’t forget to retain the records proving that you did.</p>
<p>7.1.C.1 Life Cycle Model – The organization shall establish and maintain an integrated set of guidelines that covers the life cycle of its products. This framework shall contain, as appropriate, the processes, activities, and tasks involved in the concept, definition, development, production, operation, maintenance, and (if required) disposal of products, spanning the life of the products.</p>	<p>7.1.C.1 Life Cycle Model – The organization shall establish and maintain an integrated set of <i>method(s)</i> that covers the life cycle of its products. The <i>method(s)</i> shall contain, as appropriate, the processes, activities, and tasks involved in the concept, definition, development, <i>introduction</i>, production, operation, maintenance, and (if required) disposal of products, spanning the life of the products.</p>	<p>A set of “guidelines” is no longer sufficient. The organization must have defined “methods.”</p> <p>Also added is the requirement to include new product introduction and recommendations as to what to address.</p>

<p>7.1.C.2 New Product Introduction – The organization shall establish and maintain a documented procedure(s) for introducing new products for General Availability.</p> <p>7.1.C.2-NOTE 1: The new product introduction program should include provisions for such programs as: quality and reliability prediction studies, demand and capacity studies, sales and service personnel training, and new product post-introduction evaluations.</p>	<p>7.1.C.1-NOTE The new product introduction methods should include provisions for such programs as quality and reliability prediction studies, <i>pilot production</i>, demand and capacity studies, sales and service personnel training, <i>customer documentation and training</i>, and new product post-introduction evaluations.</p>	<p>Organizations should now include pilot production and customer documentation and training as part of new product introduction,</p> <p>7.1.C.2 New Product Introduction has been removed as an adder, as well as the requirement for a “documented” procedure.</p>
<p>7.1.C.3 Disaster Recovery – The organization shall establish and maintain methods for disaster recovery to ensure the organization’s ability to recreate and service the product throughout its life cycle.</p>	<p>7.1.C.2 Disaster Recovery – The organization shall establish and maintain documented plans for disaster recovery to ensure the organization’s ability to recreate and service the product throughout its life cycle.</p> <p><i>7.1.C.2-NOTE Types of recovery capabilities should include a series of action statements related to disaster recovery. Examples include: who is notified, under what circumstances are they notified, who has authority to act, and who will coordinate the steps outlined in the plan.</i></p>	<p>Organizations must now have a “documented” plan for disaster recovery and should include those items in the note.</p>
<p>7.1.C.4 End of Life Planning</p>	<p>7.1.C.3 End of Life Planning</p>	<p>With the elimination of New Product Introduction as an adder, this becomes C.3 instead of C.4</p>
<p>7.1.S.3 Support Software and Tools Management – The organization shall ensure that internally developed support software and tools used in the product life cycle are subject to the appropriate quality method(s). Tools to be considered include: design and development tools, testing tools, configuration management</p>	<p>7.1.C.4 Tools Management – The organization shall ensure that internally developed software and/or tools used in the product life cycle are subject to the appropriate quality methods.</p> <p>7.1.C.4-NOTE Examples of tools to be considered include: design and development, testing,</p>	<p>This adder has had a name change and is now applicable to all scopes (C) and not just software (S).</p> <p>Tools to be considered</p>

tools, and documentation tools.	configuration management, documentation, and diagnostic tools, including scripts and customizations, as well as software used to build and test product.	have been removed from the “requirement” and added as “examples.”
<p>7.1.S.1 Estimation – The organization shall establish and maintain a method for estimating and tracking project factors during project planning, execution, and change management.</p> <p>7.1.S.1-NOTE 1: Project factors should include product size, complexity, effort, staffing, schedules, cost, quality, reliability, and productivity.</p>	<p>7.3.I.S.2 Estimation – The organization shall establish and maintain a method for estimating and tracking project factors during project planning, execution, and change management.</p> <p>7.3.I.S.2-NOTE: Project factors should include product size, complexity, <i>requirements changes</i>, effort, staffing, schedules, cost, quality, reliability, and productivity.</p>	<p>This adder has been moved from section 7.1 to section 7.3.1.</p> <p>The wording of the requirement remains the same. The note adds “requirements changes” as a consideration.</p>
<p>7.1.S.2 Computer Resources – The organization shall establish and maintain methods for estimating and tracking critical computer resources for the target computer, the computer on which the software is intended to operate. Examples of these resources are utilization of memory, throughput, real time performance, and I/O channels.</p>	<p>7.3.I.S.3 Computer Resources – The organization shall establish and maintain methods for estimating and tracking critical computer resources for the target computer, the computer on which the software is intended to operate.</p> <p>7.3.I.S.3-NOTE Examples of these resources are utilization of memory, throughput, real time performance, and I/O channels. <i>Firmware examples include utilization of processor, memory, I/O channels, etc.</i></p>	<p>This adder has been moved from section 7.1 to section 7.3.1.</p> <p>The examples have been broken out into a “notes” section and examples for firmware have been added.</p>
New	<p>7.2.2.C.1 Closure Tracking – All actions resulting from requirements reviews shall be tracked to closure.</p>	<p>The standard now clearly requires that not only must a review of requirements be conducted, but differences MUST be resolved as well to ensure the customer gets what he wants.</p>
<p>7.2.2.C.-NOTE 1: The contract review process should include:</p> <p>a) product acceptance planning and review, b) handling problems detected after product acceptance, including customer complaints,</p>	<p>7.2.2.C.2 Contract Review – The organization shall establish and maintain a contract review process that should include</p> <p>a) product acceptance criteria and criteria review process,</p>	<p>Information that was previously a note has now become a requirement.</p>

<p>and c) responsibility of removal and/or correction of nonconformities after applicable warranty period or during product maintenance contract period.</p> <p>7.2.2.C-NOTE 2: The product acceptance should include as appropriate: a) acceptance review process, b) acceptance criteria, c) documented test procedure(s), d) test environment, e) test cases, f) test data, g) resources involved, h) method(s) for problem tracking and resolution, and i) required acceptance test reports.</p>	<p>b) method(s) for handling problems detected after product acceptance, including customer complaints, c) plan(s) for removal and/or correction of nonconformities after applicable warranty period or during product maintenance contract period, d) identification of risks and possible contingencies, e) adequate protection of proprietary information, f) definition of the organization’s responsibility with regard to outsourced work, g) activities carried out by customer, including the customer’s roles in requirements, specifications and acceptance, h) facilities, tools, and software items to be provided by the customer, and i) all referenced standards and procedures.</p>	<p>This change emphasizes the importance of the contract review process to ensure on time delivery, quality product, etc.</p>
<p>7.2.3.C.2 Problem Severity –The organization shall assign severity levels to customer-reported problems based on the impact to the customer in accordance with the definitions of critical, major and minor problem reports contained in the glossary of this handbook. The severity level shall be used in determining the timeliness of the organization’s response.</p>	<p>7.2.3.C.2 Problem Severity – <i>Except for those products specifically excluded from severity level reporting</i>, the organization shall assign severity levels to customer-reported problems based on the impact to the customer in accordance with the definitions of critical, major and minor problem reports contained in the <i>TL 9000 Measurements Handbook</i>. The severity level shall be used in determining the timeliness of the organization’s response.</p>	<p>This additional wording clarifies the fact that some product category families do not submit problem reports by severity.</p> <p>Also the definitions of critical, major and minor are now found in the Measurements Handbook rather than the Requirements Handbook.</p>
<p>7.2.3.H.1 Organization’s Recall Process – The organization shall establish and maintain a documented procedures(s) for identifying and recalling products that are unfit to remain in service.</p>	<p>7.2.3.HS.1 Organization’s Recall Process – The organization shall establish and maintain a documented procedures(s) for identifying and recalling products that are unfit to remain in service.</p>	<p>Software is now covered by this requirement.</p>
<p>New</p>	<p>7.2.3.HS.2 Design and Development Process Quality Measurements Data Reporting – On request</p>	<p>This adder requires the organization to submit a</p>

	<p><i>by the customer, communications shall include reporting and evaluation of a jointly agreed set of design and development process measurements.</i></p>	<p>set of metrics for the design and development process to the customer upon his request. The customer wants to ensure the performance level of the D&D process is adequate to meet his requirements. A set of measurements must be developed by the customer AND the organization and then submitted.</p>
<p>7.3.1.C.1 Project Plan – The organization shall establish and maintain a project plan based on the defined product life cycle model. The project plan should include:</p> <ul style="list-style-type: none"> a) project organizational structure, b) project roles and responsibilities, c) interfaces with internal and external organizations, d) means for scheduling, tracking, issue resolution, and reporting, e) budgets, staffing, and schedules associated with project activities, f) method(s), standards, documented procedures(s), and tools to be used, g) references to related plans(e.g., development, testing, configuration management, and quality), h) project-specific environment and physical resource considerations (e.g., development, user documentation, testing, operation, i) customer, user, and supplier involvement during the product life cycle (e.g., joint reviews, informal meetings, and approvals), j) management of project quality, 	<p>7.3.1.C.1 Project Plan – <i>The organization’s project planning activities shall be based on the defined product life cycle model (see 7.1.C.1).</i> The project plan should include</p> <ul style="list-style-type: none"> a) project organizational structure, b) roles, responsibilities, and <i>accountabilities</i> of the project team, c) <i>roles, responsibilities, and accountabilities of related teams or individuals, within and outside the organization, and interfaces between them and the project team</i>, d) means for scheduling, tracking, issue resolution, and management reporting, e) budgets, staffing, and schedules associated with project activities, f) identification of method(s), standards, documented procedures(s), and tools to be used (<i>If such items are clearly defined as part of the product life cycle model, a reference to that life cycle model is sufficient</i>), g) references to related plans(e.g., development, testing, configuration management, and quality), h) project-specific development or service delivery environment and physical resource considerations 	<p>A substantial addition here is the requirement to define not just roles and responsibilities but “accountabilities” of the project team and any external teams or individuals.</p> <p>The reporting requirement has been clarified to indicate that it is “management” that should be receiving these reports.</p> <p>Leeway has been added to allow organizations to reference parts of the life cycle model, rather than repeat them in the plan.</p> <p>Don’t forget “service” delivery.</p>

<p>k) risk management and contingency plans (e.g., technical, cost and schedules), l) performance, safety, security, and other critical requirements, m) project-specific training requirements, n) required certifications (e.g., product certifications or employee technical certifications), o) proprietary, usage, ownership, warranty, licensing rights, and p) post-project analysis</p>	<p>(e.g., resources to address development, user documentation, testing, operation, required development tools, secure computing environment, lab space, workstations, etc.), i) customer, user, and supplier involvement during the product life cycle (e.g., joint reviews, informal meetings, and approvals), j) management of project quality, k) risk management and contingency plans (e.g., risks of rework, poor field reliability and defects, resource and schedule variance), l) project-specific training requirements, m) required certifications (e.g., product certifications or employee technical certifications), n) proprietary, usage, ownership, warranty, licensing rights, and o) post-project analysis</p>	<p>Clarification via more descriptive examples has been added.</p>
<p>7.3.1.C.3 Test Planning – Test plans shall be documented and results recorded. Test plans should include: a) scope of testing (e.g., unit, feature, integration, system, acceptance), b) types of tests to be performed (e.g., functional, boundary, usability, performance, regression, interoperability), c) traceability to requirements, d) test environment(e.g., relevancy to customer environment, operational use), e) test coverage (degree to which a test verifies a product’s functions, sometimes expressed as a percent of functions tested), f) expected results, g) data definition and database requirements, h) set of tests, test cases (e.g., inputs, outputs, test criteria), and documented test procedure(s), i) use of external testing, j) method of reporting and resolving defects.</p>	<p>7.3.1.C.3 Test Planning – Test plans shall be documented and should include a) scope of testing (e.g., unit, feature, integration, system, acceptance, field, migration and regression), b) types of tests to be performed (e.g., functional, boundary, usability, performance, regression, interoperability, stress), c) traceability to requirements, d) test environment(e.g., relevancy to customer environment, operational use), e) test coverage (degree to which a test verifies a product’s functions, sometimes expressed as a percent of functions tested), f) expected results, g) data definition and database requirements, h) set of tests, repeatable test cases (e.g., inputs, outputs, test criteria), and documented test procedure(s), i) use of external testing, j) method(s) of reporting and resolving defects, and k) customer test requirements.</p>	<p>Field, migration and regression testing have been added to the scope and stress testing has been added to the types of tests to be performed.</p> <p>There is now a requirement to also document “subsequent action taken” based on test results.</p> <p>It is clear now that the organization must comply with the “customer’s” test requirements and not just their own internal testing requirements.</p>

<p>7.3.1.C.3-NOTE 1: Testing may be covered at several levels.</p>	<p>The results of testing and <i>subsequent action taken shall be recorded (see 4.2.4).</i></p>	
<p>7.3.1.S.2 Migration Planning – The organization shall develop and document a migration plan when a system, or software product is planned to be migrated from an old to a new environment. The plan should include:</p> <ul style="list-style-type: none"> a) requirements analysis and definition of migration, b) development of migration tools, c) conversion of product and data, d) migration execution, e) migration verification, and f) support for the old environment in the future. 	<p>7.3.1.HS.1 Migration Planning – The organization shall develop and document a migration plan when a system, <i>hardware</i> or software product is planned to be migrated from an old to a new <i>operational</i> environment. <i>If the old environment will no longer be supported, users shall be given notification of migration plans and activities which shall include a description of the new environment with its date of availability, and a description of other support options available, if any, once support for the old environment has been removed.</i></p> <p>The migration plan <i>should</i> also include</p> <ul style="list-style-type: none"> a) requirements analysis and definition of migration, b) development of migration tools, c) conversion of product and data, d) migration execution, e) migration verification, and f) support for the old environment in the future. <p>7.3.1.HS.1-NOTE 1 <i>The operational environment is made up of hardware, software or systems on which the product depends, that the customer purchases and installs separately, from either the organization or other suppliers. Examples of changes from old to new software operational environments include upgrades to the operating system, database, or communications protocol stack. Examples of changes from old to new hardware operational environments include using existing circuit packs in new racks or with new controllers, or upgrading computer hardware. Both hardware and software platform migration could affect either hardware or software components or systems so migration plans</i></p>	<p>This adder now includes hardware as well.</p> <p>Clarification has been given to ensure that the migration planning considers the “operating” environment of the customer and not the internal development environment.</p> <p>A new paragraph requires the organization to notify customers of the migration plans.</p> <p>Note 1 gives examples of hardware, software and system products.</p> <p>Note 2 requires the organization to assist the customer in storing and accessing existing data if there will be no support for the old environment.</p>

	<p><i>should cover all possibilities.</i></p> <p>7.3.1.HS.1-NOTE 2 <i>If the old environment will no longer be supported, consideration should be given to arrangements for access to data that was used by, or associated with, the old operational environment, for data protection and audit purposes, in accordance with regulatory and contract requirements.</i></p>	
New	<p>7.3.1.HS.2 Design and Development Process Quality Measurement Planning and Implementation – During the design and development planning phase, the organization shall establish and maintain a method(s) for selecting and reporting appropriate design and development process quality measures for the project. As recommended during this phase, the measurements system shall be implemented appropriately to the project.</p> <p>7.3.1.HS.2-NOTE See the document “Set Up and Operation of a Design Process Measurement System” in the TL 9000 Registration Guidance of tl9000.org for guidelines to aid in selecting and establishing appropriate design and development process measurements for the project.</p>	The organization must develop a way to determine which process quality measures they will use for each project and then implement them.
New	<p>7.3.1.S.4 Regression Test Planning – If regression testing is to be performed, test plans shall specify which tests are regression and what features are covered by these regression tests.</p>	<p>The intent here is to ensure that regression testing is done according to a formalized plan.</p> <p>8.2.4.S.1 Test Documentation adds the requirement to have a documented procedure and keep records.</p>
7.3.2.S.2 Requirements Allocation - The organization shall document the allocation of	7.3.2.C.3 Requirements Allocation - The organization shall document the allocation of the	This adder has now become a “common”

the product requirements to the product architecture.	product requirements to the product architecture. <i>7.3.2.C.3-Note Examples of requirements which should be allocated are response time for software, heat dissipation for hardware and service response time for services.</i>	adder and is no longer applicable only to software. The new note gives examples of where requirements allocation applies.
7.3.3.S.1 Software Design and Development Output – Software design and development outputs should include, but are not limited to: a) system architecture, b) system detailed design, c) source code, and d) user documentation.	7.3.3.HS.1 Design and Development Output – Design and development outputs should include, but are not limited to: a) system architecture, b) system detailed design, c) source code, and d) user documentation.	This adder has now become a hardware and software adder, but otherwise remains the same.
New	<i>7.3.5.C.1 Verification of Documentation – The organization shall verify the customer and/or user documentation prior to product delivery.</i>	OH OH. Some organization(s) must have been sending out incorrect user documentation and now something that should have been common sense is a hard requirement.
New	<i>7.3.5.HS.1 Stress Testing – The organization shall test the product under stress conditions, including, but not limited to, out-of boundary and invalid input conditions, high volume and peak load simulations, and operational errors.</i>	Some telco must have run into a problem where their hardware or software did some funky things when out-of-boundary conditions were met, therefore if you weren't doing stress testing before you must do it now.
New	<i>7.3.5.HS.2 Abnormal Conditions – The organization shall test the product under abnormal conditions, which shall include, as appropriate</i> <i>a) hardware errors,</i> <i>b) software errors,</i>	The organization is now required to do testing that may cause the software or hardware to fail, due to potential error

	<p><i>c) operations, administration, maintenance and provisioning (OAM&P) errors,</i> <i>d) overload traffic,</i> <i>e) invalid user input, and</i> <i>f) system recovery from an outage.</i></p>	<p>conditions. The purpose as in stress testing is to ensure that the hardware and/or software reacts in the appropriate manner.</p>
New	<p>7.3.5.S.1 System Testing – Each software release shall be subjected to a system test in accordance with a documented system test plan.</p>	<p>Organizations responsible for software must do a system test to ensure all components of the system work together AND there must be a documented system test plan AND you must do it for EVERY new release.</p>
<p>7.3.6.S.1 Release Management – The organization shall establish and maintain a documented procedure to control the release and delivery of software products and documentation. The documented procedure(s) should include methods to provide for the following: a) release planning information delivered to the customer sufficiently in advance of the release, b) product introduction and release schedules to the customer, c) detailed descriptions of product features delivered, and changes incorporated in new software products or releases, and d) advising the customer of current or planned changes.</p>	<p>7.3.6.S.1 Release Management – The organization shall establish and maintain <i>method(s)</i> to ensure that the release and delivery of software products and related documentation are carried out under controlled conditions. Method(s) should provide for the delivery to the customer of a) release planning information in advance of the release, b) product introduction and release schedules, c) detailed descriptions of product features delivered, including any changes incorporated in new software products or releases, and d) advisories regarding current or planned changes to <i>contractual terms (see 7.3.7.C.2)</i></p>	<p>The requirement for a documented procedure has been changed in favor of a method.</p> <p>Interestingly enough d) has been revised to include only those changes to “contractual terms.”</p>
<p>7.3.7.C.1 Change Management Process - The organization shall establish and maintain a process to ensure that all requirements and design changes, which may arise at any time during the product life cycle, are managed and tracked in a systematic and timely manner and do not adversely affect quality, reliability and</p>	<p>7.3.7.C.1 Change Management Process - The organization shall establish and maintain a <i>documented procedure(s)</i> to ensure that all requirements and design changes, which may arise at any time during the product life cycle, are managed and tracked in a systematic and timely manner <i>appropriate to the life cycle stage</i>. The organization</p>	<p>The organization is now required to have a “documented” procedure for change management.</p> <p>Clarification has been added indicating that the</p>

<p>design intent. Management of changes should include</p> <ul style="list-style-type: none"> a) impact analysis, b) planning, c) implementation, d) testing, e) documentation, f) communication, and g) review and approval. 	<p>shall ensure that changes which adversely affect <i>mutually agreed conditions</i> for quality, reliability and <i>functional</i> intent are <i>reviewed with the customer prior to approval</i>. Management of changes should include</p> <ul style="list-style-type: none"> a) impact analysis, <i>including impact on resources and schedule</i>, b) planning, c) implementation, d) testing, e) documentation, f) communication, and g) review and approval. <p>7.3.7.C.1-NOTE While a change management process is required throughout the life cycle, controls within that process may depend on the life cycle stages. For example, during design, the organization should be able to react to rapidly changing customer requirements, and take advantage of emerging technologies with an encompassing, responsive change management process. After General Availability the change management process scope should consider how the change on the operation and maintenance of the product and its installed base impacts the community of customer and stakeholders. The considerations should include quality, reliability, and functional intent.</p>	<p>managing and tracking of changes may vary depending upon the life cycle stage that the product is in currently.</p> <p>Changes that affect previously agreed upon conditions must be reviewed and approved by the customer.</p> <p>The note gives examples of different life cycle stages and how change management may be applied.</p>
<p>7.3.7.HS.1 Problem Resolution Configuration Management – The organization shall establish an interface between problem resolution and configuration management to ensure fixes to problems are incorporated in future revisions.</p>	<p>7.3.7.C.3 Problem Resolution Configuration Management – The organization shall ensure that its configuration management system tracks fixes to problems and incorporates those fixes in future revisions.</p>	<p>This adder is now a “common” requirement and not just for hardware and/or software.</p> <p>The intent remains the same while the wording has changed a bit.</p>
<p>7.4.1.C.1 Purchasing Procedure(s) – The documented purchasing procedure(s) shall</p>	<p>7.4.1.C.1 Purchasing Procedure(s) – The organization <i>shall establish and maintain</i> a</p>	<p>The biggest change here is the addition of the</p>

<p>include:</p> <ul style="list-style-type: none"> a) product requirements definition, b) risks analysis and management, c) qualification criteria, d) contract definition, e) proprietary, usage, ownership, warranty, and licensing rights are satisfied, f) future support for the product is planned, g) ongoing supply-base management and monitoring is in place, h) supplier selection criteria are defined, i) suppliers are re-evaluated based on defined criteria, and j) feedback is provided to key suppliers based on data analysis of supplier performance. <p>7.4.1.C.1-NOTE The documented procedure(s) should be applicable to off-the-shelf product. This typically includes original equipment manufacturer (OEM) products used in manufacturing and commercial off-the-shelf (COTS) products used in software systems.</p>	<p>documented purchasing procedure(s) <i>to ensure</i></p> <ul style="list-style-type: none"> a) product requirements <i>are clearly defined,</i> b) risks are <i>understood and managed,</i> c) qualification criteria <i>are established,</i> d) <i>acceptance criteria are established,</i> e) contracts are defined, f) proprietary, usage, ownership, warranty, and licensing rights are satisfied, g) future support for the product is planned, h) ongoing supply-base management and monitoring is in place, i) supplier selection criteria are defined, j) suppliers are re-evaluated based on defined criteria, and k) feedback is provided to key suppliers based on data analysis of supplier performance. <p>7.4.1.C.1-NOTE The documented procedure(s) should be applicable to off-the-shelf product. This typically includes original equipment manufacturers (OEM) products used in manufacturing and commercial off-the-shelf (COTS) products used in software systems.</p>	<p>“acceptance criteria” being established as part of the documented procedure.</p>
<p>7.5.1.C.1 Organization’s Support Program – The organization shall ensure that customers are provided support to resolve product related problems.</p>	<p>Removed and 7.5.1.C.2 Service Resources becomes 7.5.1.C.1</p>	
<p>New</p>	<p>7.5.1.C.2 Product Delivery – The organization shall establish and maintain method(s) to minimize interference with the customer’s normal site operation and service during product delivery and installation.</p>	<p>Before going to your customer to deliver your service or product, have a plan in place as to how you will minimize the impact to your customer and his operations.</p>
<p>7.5.1.HS.1 Emergency Service – The organization shall ensure that services and resources are available to support recovery from emergency failures of product in the field</p>	<p>7.5.1.HS.1 Emergency Service – The organization shall ensure that services and resources are available to support recovery from emergency failures of product in the field throughout its expected life. <i>The</i></p>	<p>As well as providing emergency services the organization must be aware of situations that</p>

<p>throughout its expected life.</p>	<p><i>organization shall identify potential situations that may have an impact on its ability to provide the emergency service and shall have response plans to address these situations. The plans shall be based on risk and periodically assessed.</i></p>	<p>could prevent it from providing those services and have response plans to address those situations.</p>
<p>7.5.1.HS.2 Installation Plan – The organization shall establish and maintain a documented installation plan(s). The installation plan(s) shall identify the resources, the information required, and list the sequence of events. The results associated with the installation sequence shall be documented.</p>	<p>7.5.1.HS.2 Installation Plan – The organization shall establish and maintain a documented installation plan(s). The installation plan(s) shall identify the resources, the information required, the sequence of events <i>and any necessary records.</i></p>	<p>The addition here is the requirement for the installation plan to include any records that need to be retained. This will be helpful to the installer.</p>
<p>7.5.1.S.1 Patching Procedures – The organization shall establish and maintain a documented procedure(s) that guide the decision to solve problems by patching. a) The documented procedure(s) shall address patch development procedures, propagation (forward and backward), and resolution. b) The documented procedures shall be consistent with customer needs or contractual requirements for maintenance support. c) The organization shall provide the customer with a statement of impact on the customer’s operation for each patch.</p>	<p>7.5.1.S.1 Patching Procedures – The organization shall establish and maintain a documented patching procedure(s) that a) guides the decision to solve problems by patching, b) addresses patch development procedures, propagation (forward and backward) and resolution, c) is consistent with customer needs or contractual requirements for maintenance support, and d) ensures that the organization provides the customer with a statement of impact on the customer’s operation for each patch.</p>	<p>There is a bit less wording but the requirement has not changed.</p>
<p>7.5.2.HV.1 – Operational Changes</p>	<p>7.5.1.HV.1 – Operational Changes</p>	<p>When the requirement was listed under 7.5.2, the implication was that it applied to special processes only, such as welding, soldering or wire wrapping. The move to 7.5.1 ensures that the organization knows this requirement is for all processes.</p>
<p>7.5.1.V.1 Software Used in Service Delivery – Organizations shall document and implement</p>	<p>7.5.1.V.1 Software Used in Service Delivery – <i>The organization shall establish and maintain a</i></p>	<p>There is now a requirement for a</p>

<p>processes for the maintenance and control of software used in service delivery to ensure continued process capability and integrity.</p>	<p><i>documented procedures(s)</i> for the maintenance and control of software used in service delivery to ensure continued process capability and integrity.</p>	<p>documented procedure.</p>
<p>7.5.3.H.2 Traceability of Design Changes – The organization shall establish and maintain a documented procedure(s) which provides traceability of design changes to identifiable manufacturing dates, lots or serial numbers.</p>	<p>7.5.3.H.2 Traceability of Design Changes – The organization shall <i>define and implement methods necessary to</i> provide traceability of design changes to identifiable manufacturing dates, lots or serial numbers.</p>	<p>The required for a documented procedure has been replaced by “methods.”</p>
<p>7.5.5.C.1 Anti-Static Protection – Anti-static protection shall be employed, where applicable, for components and products susceptible to electrostatic discharge (ESD) damage. Consider components and products such as: integrated circuits, printed wiring board assemblies, magnetic tapes and/or disks, and other media used for software or data storage</p>	<p>7.5.5.C.1 Electrostatic Discharge Sensitive (ESDS) Protection – Where applicable, anti-static protection shall be employed for components and products susceptible to electrostatic discharge (ESD) damage.</p> <p>7.5.5.C.1-NOTE 1 Types of components and products which should be protected include <i>electronic parts</i>, integrated circuits, printed wiring board assemblies, magnetic tapes and disks, and other media used for software or data storage.</p> <p>7.5.5.C.1-NOTE 2 Certification to ANSI/ESD S20.20 published by the ESD Association should be taken as an indication that the certified facilities meet TL 9000 requirements 6.2.2.C.4 and 7.5.5.C.1 concerning ESD protection. Please check the TL 9000 website (tl9000.org) for the acceptability of any later editions of the ANSI standard.</p>	<p>Note 1 includes examples that were previously found as part of the requirement. “Electronic parts” has been added as an additional example.</p> <p>Note 2 tells organizations that if they are certified to the ESD S20.20 standard then they have the appropriate ESD protection in place.</p>
<p>7.5.5.HS.1 Packaging and Labeling Audit – The organization shall include a packaging and labeling audit in the quality plan or documented procedure(s). This may include, for example, marking, labeling, kitting, documentation, customer-specific marking, and correct quantities.</p> <p>7.5.5.HS.1-NOTE This audit is normally done on products ready to ship.</p>	<p>7.5.5.HS.1 Packaging and Labeling Verification – The organization shall <i>establish and maintain methods</i> to ensure that the packaging and labeling of products and components conform to specified requirements.</p> <p>7.5.5.HS.1-NOTE Packaging and labeling verification is normally performed on products ready to ship and may include, for example, marking, labeling, kitting, documentation, addressing, customer-specific marks, and verification of quantities to be shipped.</p>	<p>A packaging and labeling audit to ensure conformance to specified requirements is no longer required. However the organization must have some “method.” You could still use an “audit” if that works for you.</p>

<p>7.5.5.H.1 Deterioration – Where the possibility of deterioration exists, materials in storage shall be controlled (e.g., date stamped/coded) and materials with expired dates shall be deemed non-conforming.</p>	<p>7.5.5.HV.1 Deterioration – Where the possibility of deterioration exists, the organization <i>shall establish and maintain methods to determine when materials that may impact product quality have deteriorated or exceeded the expiration dates, and assess any required subsequent action.</i></p>	<p>This adder is now a service requirement as well as a hardware requirement.</p> <p>Product that has passed its expiration date or has deteriorated must be dealt with appropriately, where before the product would fall under your nonconforming product procedure.</p>
<p>7.6.H.1 Equipment Identification – Monitoring and measuring devices that are either inactive or unsuitable for use shall be visibly identified and not used. All monitoring and measuring devices that do not require calibration shall be identified.</p>	<p>7.6.C.1 Equipment Identification – Monitoring and measuring devices that are either inactive or unsuitable for use shall be visibly identified and not used. All monitoring and measuring devices that do not require calibration shall be identified.</p>	<p>The scope of this adder has been expanded to “common” from hardware only.</p>
<p>8.2.1.C.1 Customer Satisfaction Data – The organization shall establish and maintain a method to collect data directly from customers concerning their satisfaction with provided products. The organization shall also collect customer data on how well the organization meets commitments and its responsiveness to customer feedback and needs. This data shall be collected and analyzed. Trends of the data shall be kept.</p>	<p>8.2.1.C.1 Customer Satisfaction Data – The organization shall establish and maintain a method to collect data directly from customers concerning their satisfaction with provided products. The organization shall also collect customer data on how well the organization meets commitments and its responsiveness to customer feedback and needs. This data shall be <i>analyzed and trended.</i></p>	<p>The intent has not changed.</p>
<p>8.2.3.C.1 Process Measurement – Process measurements shall be developed, documented, and monitored at appropriate points to ensure continued suitability and promote increased effectiveness of processes.</p>	<p>8.2.3.C.1 Process Measurement – Process measurements shall be <i>identified</i>, documented, and monitored at appropriate points to ensure continued suitability and promote increased effectiveness of processes. <i>This includes the establishment of appropriate design process measurements. Key process measurements that impact product quality should have specific performance targets or control limits established.</i></p>	<p>Once again we are reminded of the importance of “design” process measurements and their inclusion in the organization’s measurement process.</p> <p>Not only must we</p>

		measure and/or monitor key measurements, we must also have performance targets we strive to meet or control limits that we must stay within.
8.2.4.H.1 Periodic Retesting – The organization shall establish and maintain a documented procedure(s) that ensures products are periodically retested to assess the product’s ability to continue to meet design requirements.	8.2.4.H.1 Periodic Retesting – The organization shall establish and maintain a documented procedure(s) that ensures products are periodically retested to assess the product’s ability to continue to meet design requirements. <i>When determining the depth of the retest, the organization should consider the conditions in 8.2.4.H.3</i>	The addition here is the reference to 8.2.4.H.3 Frequency of Testing to ensure the organization considers these requirements.
8.2.4.HV.2 Inspection and Test Records – Inspection and test records shall include: a) product identification, b) quantity of product inspected, c) documented inspection procedure(s) followed, d) person(s) performing the test and inspection, e) date of inspection and/or test, and f) number, type, and severity of defects found.	8.2.4.HV.2 Inspection and Test Records – Inspection <i>or</i> test records shall include a) product identification, b) quantity of product, c) documented procedure(s) followed, d) person(s) performing the test <i>or</i> inspection, e) <i>calibrated equipment used (see 7.6)</i> f) date performed, and g) number, type, and severity of defects found.	Organizations must now include the calibrated equipment used as part of their inspection and test records.
8.4.H.1 Field Performance Data – The quality management system shall include the collection and analysis of field performance data which can be used to help identify the cause and frequency of equipment failure. This information shall be provided to the appropriate organizations to foster continual improvement.	8.4.HS.1 Field Performance Data – The quality management system shall include the collection and analysis of field performance data which can be used to help identify the cause and frequency of <i>product</i> failure. <i>In addition, no trouble found (NTF) data shall also be maintained.</i> This information shall be provided to the appropriate organizations to foster continual improvement.	This adder now applies to software organizations as well as hardware.