

IBM SUPPLIER QUALITY REQUIREMENTS DOCUMENT (SQRD)

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This document is maintained by IBM Systems Supply Chain Engineering (SCE)

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1 Definitions

- “Authorized Third Party” shall mean a third party or their affiliates that are authorized to purchase the Products directly from Supplier for use in products that it produces or services for Buyer.
- “Agreement” shall mean the contract or SOW executed between IBM and the Supplier
- “Bill of Materials or “BOM” shall mean the parts, materials or services that make up a Product.
- “Buyer” shall mean the IBM entity that executed the Agreement or a Participation Agreement incorporating the terms of the Agreement.
- “Buyer Sourced Material” shall mean parts, materials or services that are listed on a BOM that has Buyer as the source of such materials.
- “Customer” shall mean Buyer’s end customer for the Product or products that contain the Product
- “Defective Product” unless agreed in the Agreement to the contrary, a Defective Product is any Product that fails to comply with the Specifications.
- “Document” shall mean this document and any items that are incorporated by reference into this document.
- “EICC” shall mean the Electronic Industry Citizenship Coalition, established in 2004, to promote a common code of conduct for the electronics, and information and communications technology (ICT) industry. EICC members are working to improve environmental and worker conditions in the supply chain.
- “Engineering Change” means any change to the Product
- “Key Contact Information” shall mean Supplier’s contacts for business, quality and technical Issues, their name, address, e-mail address, phone number and emergency phone number(s).
- “Material Supplier” shall mean suppliers that provide parts or produce lower level assemblies for Supplier.
- “Non-Conforming Material” shall mean any Products that, upon delivery to Buyer, an Authorized Third Party or Buyer’s Customer that fails to conform with any requirements of the Agreement.
- “Product” shall mean the same part number of associated Engineering Change(s) thereto that Supplier prepares for or provides to Buyer as may be fully described in the applicable purchase documents. Product shall also include all constituent parts of said part number.
- “Product Quality Addendum” shall mean an optional document, provided to Supplier from Buyer, that sets forth specific quality requirements for a Product including technical, and/or quality goals, and any exceptions to this “Supplier Quality Requirements Document.”
- “Supplier Quality Document” shall mean an optional document, provided by Supplier to the Buyer, that documents Supplier’s commitments and methods to meet all quality requirements of this Document and the Product Quality Addendum; Buyer Approved Waivers / Specification exceptions and the Supplier’s Quality and Reliability Commitments.
- “Specification” shall mean the document or set of documents that are mutually agreed by the parties that describe the product to be produced and all associated requirements for that Product.
- “Statement of Work” or “SOW” shall mean a separate agreement that establishes the terms of purchase for the Product and which will incorporate this Document as a specification along with other required specifications for the product.
- “Subcontractor” shall mean suppliers that perform manufacturing related services for the Supplier as part of Supplier’s production of the Product.
- “Supplier” shall mean the party to the SOW and any Supplier Affiliate that has agreed to sell the Product to Buyer, Buyer’s Affiliates, or Authorized Third Parties. All requirements of this Document shall apply to both the Supplier and any Supplier Affiliate that produces the Product or any part thereof for Buyer or Authorized Third Parties.

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- “Supplier Conduct Principles” shall mean the thirteen provisions that define the social responsibility requirements for IBM suppliers and their suppliers.
- “Supply Chain Social Responsibility” shall mean the policies and practices of companies and their suppliers that ensure compliance to law, respect of human rights, safe and healthy working conditions and environmental compliance.

Acronyms used in this agreement are described in Section 17 of this Document.

2 General

- Order of Precedence:
In the event of any inconsistency between this Document and the Agreement or SOW, the terms in the Agreement or SOW shall have priority. For any documents that are incorporated by reference into this Document, in the event of an inconsistency, this Document shall have priority. If this Document contemplates future writings between the parties to establish the specifics of a quality program for a Product or set of products, that later writing shall have precedence over this Document. If any Definitions set forth in 1 above are also defined in the Agreement or SOW, the definition(s) contained in the Agreement or SOW shall have priority.
- Exceptions:
Any agreed to exceptions to this Document will be set forth in the Product Quality Addendum, Supplier Quality Document or equivalent.
- Confidentiality:
All information requested hereunder and all access to Supplier’s or any Subcontractor or Material Supplier facilities, plans and processes shall be deemed to be non-confidential unless the parties specifically agree to execute a Confidential Disclosure Agreement (CDA) and CDA Supplement for the requested information or access.
- Waiver:
Any waiver contemplated by this document shall require Buyer’s Approval.

3 Introduction

3.1 Overview of Quality Program

This SQRD Document outlines the minimum Supplier quality and process requirements for supplying Products to IBM or Authorized Third Parties. These Products shall be manufactured to meet the mutually agreed Specification. Supplier shall have a quality program that exercises control over its manufacturing process and its Subcontractors and Material Suppliers to comply with the requirements of this SQRD Document and the Agreement.

Quality will be measured on a continuous basis and will be reported to IBM in accordance with a schedule and in a format that is mutually agreed upon. Business and process controls will be required to prevent incidences of defective Product from reaching Buyer, its Authorized Third Parties or its Customers. All quality related problems will require analysis, cause determination and corrective action as defined herein. Supplier, any applicable Supplier Affiliate and any Subcontractor or Material Supplier’s process controls must be demonstrated. Supplier shall drive continuous improvement to reduce defects over time in accordance with annual goals that will be mutually agreed upon.

3.2 Supplier Quality Policy

The Supplier shall have a quality policy and documented quality program in support of their design and manufacturing operations which meets the minimum requirements of this document.

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3.3 Supplier Organization

As part of the documented quality program, Supplier shall provide a Key Contact List. Supplier shall promptly notify Buyer of any changes to the Key Contact List.

4 Manufacturing Qualification and Process Control

Supplier's documented quality program shall include Product or process qualification plans for each Product.

4.1 Manufacturing Process Qualification

Unless a waiver is granted, all Product shipments must be produced using the approved Product, manufactured using an IBM approved supplier process, or process qualification plan (for new product introduction).

Buyer reserves the right to qualify the Supplier's process. For processes qualified by Buyer, Supplier shall not make any changes without Buyer's prior written approval, which shall not be unreasonably withheld. The Supplier shall have a defined methodology for integrating new processes and process changes into Supplier's operations. This methodology shall include as a minimum the following:

1. The number and duration of consecutive successful trials required prior to declaring the process qualified
2. The potential effect of the new process or alteration on other required manufacturing operations (including those subcontracted)
3. The expected timetable for updating quality plans, flow charts, maintenance files, operator training plans, etc.
4. Ensuring related tooling is qualified as part of the process
5. The timing of the qualification process

Prior to a Product being purchased by Buyer and as part of a Specification or other requirements document, Buyer may provide additional qualification requirements for that Product's Qualification. Upon Supplier's agreement with those additional requirements, those additional requirements must be demonstrated.

4.1.1 Manufacturing Process Qualification Approval

Products produced for Buyer, or its Authorized Third Parties must have a documented qualification plan. That plan must be mutually agreed by Buyer and Supplier prior to qualification testing. Test results shall be provided to both parties promptly and in a format mutually agreed upon.

4.2 Manufacturing Process Documentation

The manufacturing process from receipt of purchased/consigned materials to shipment of Product shall be documented and be made available to Buyer upon request. This shall include, but not be limited to the following:

1. Receipt and inspection of incoming parts and materials
2. Fabrication and/or assembly operations
3. Process work instructions
4. In-process inspections and tests
5. Final inspections and tests
6. Packaging, handling, storage, and shipment of product
7. In-line fall-out/rework
8. Failure analysis and closed loop corrective action
9. ETN (Equivalent to New) where applicable
10. Stop Ship / Stop Build Process

4.3 Manufacturing Process Measurements

Suppliers shall establish manufacturing process measurements. Measurement collection and reporting methodology shall be documented. Critical process parameters will be mutually agreed by Buyer and Supplier. For any purchases using Supplier's published specifications, the agreed upon parameters shall constitute part of the Specification even if they are not included in Supplier's Published Specification. The method used to detect, flag and contain product exhibiting defects or characteristics

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that may cause higher than normal failure rate than mutually agreed upon, shall be included in the process metric definitions. Examples of process measurement may include SPC (Statistical Process Control), in-process audits, roving inspections, etc.

4.4 Manufacturing Test Plan

The Supplier shall develop a Product test/conformance plan to measure conformance with the mutually agreed specification. Requirements for on-going Product test in accordance with the test plan will be mutually agreed by the parties.

4.5 First Piece Build and Inspection Requirements

When specifically requested and upon mutual agreement, Supplier shall document their first piece build inspection requirements for all new Products or revisions to existing Products, and the Supplier will provide their first piece built inspection report(s) to Buyer.

4.5.1 General Requirements

Elements of an acceptable process for First Piece Builds include:

- Measurement, to the agreed upon specifications
- Identification and inspection of components and materials from receipt through processing, final inspection, and shipment
- Thorough and complete final inspection of the "First Piece" with recording of the actual numerical measurements
- Retention of written "First Piece Inspection" reports, test samples or coupons, certifications, and all other inspection records

Buyer reserves the right to conduct, and / or review results of Supplier's First Article Inspection on the first quantity of Product built following an approved change. Supplier shall perform Failure Analysis and take corrective action in accordance with the Agreement for all defects found during the first piece build.

4.6 Sub-Tier Procurement Requirements

Supplier shall manage their Material Suppliers and Sub-contractors (for both Buyer & non-Buyer specified), by methods that include, but are not limited to the following:

- Managing supplier selection
- Managing qualification, and quality management.
- Performing ongoing assessments of supplier capabilities.
- Driving sub-tier supplier continuous process improvement.
- Environmental compliance (See Section 11.2.1)
- Supply Chain Social Responsibility compliance (See Section 11.2.2)

With the exception of any materials purchased from Buyer, Supplier shall require all suppliers and sub-contractors to ensure that all material, and/or services procured in meeting the Supplier's obligations meet the agreed Specifications and other contract requirements and any mutually agreed changes thereto. This may include but not be limited to Product Specifications, BOM's (Bill of Material), AVL's (Approved Vendor List), and CPL's (Component Placement List). The Supplier shall not procure any parts, components, materials or services from sources other than those sources agreed upon during the part/product qualification, unless approved in writing by Buyer. Unless specifically agreed otherwise in the approval, Buyer reserves the right to limit or rescind any alternative source approval at any time and Supplier shall promptly adjust future sourcing to the approved source and take commercially reasonable efforts to stop receipt of additional product from other sources. If Buyer agrees, Supplier may use the approved alternative source material until it exhausts any inventory or non-cancelable orders placed with the alternative source. If Buyer does not agree to continued use and such material is custom to Buyer, Buyer shall reimburse Supplier for its reasonable costs of such material and Supplier shall transfer such material to Buyer at Buyer's reasonable expense or Buyer may require Supplier to dispose of such material at Buyer's reasonable expense.

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4.6.1 Sub-Contractor and Material Supplier Selection

For all Subcontractors and Material Suppliers used in production of the Product, the Supplier shall establish a sub-tier supplier quality management program which includes all elements of this Document. Suppliers' selection process shall include, but is not limited to the following: financial performance, competitiveness, technology offerings, capabilities assessment and SCSR performance. Sub-tier survey results and sub-tier management process assessments should consider the following aspects of sub-tier supplier capabilities: engineering support, supplier selection, AVL control, qualification, supplier audits, supplier quality management system, supplier performance monitoring, quality issue management and SCSR risk management. Supplier shall take reasonable steps to prevent the use of high risk Suppliers in the production of Products for Buyer. A high risk Supplier is one that requires material waivers to any of the above criteria or that has financial performance below a level that is recommended by Buyer.

4.6.2 Subcontractor and Material Supplier Monitoring

The Supplier will provide reasonable evaluation, qualification, and on-going assessments of Subcontractor and Material Supplier capabilities to minimize risk to Buyer. The type and frequency of quality control indicators received (quality performance, root cause/corrective actions, problem tracking, etc.) will be documented. Subcontractor and Material Supplier management will be included as a critical process to review in Supplier self-audits. Subcontractor and Material Supplier management process documentation will include, as a minimum:

- Quality plan/requirements
- Audit criteria (template)
- Audit schedule and reports

4.7 Supplier Outgoing Quality Control

Supplier shall establish and maintain an outgoing quality control process. Specific requirements of that process and agreed quality levels and goals shall be established and will be mutually agreed periodically (usually annually). If Buyer and Supplier fail to reach agreement prior to the commencement of a new period, the quality levels and goals previously in effect will continue to apply until such time as mutual agreement on new levels and goals is reached.

4.8 Product Identification and Lot Traceability

The Supplier shall establish and maintain procedures and processes for the identification and lot traceability and quantities of critical items during all stages of production, as well as for delivery to Buyer, its Authorized Third Parties or its Customers. Identification must be traceable through to the finished Product by serial numbers or equivalent methods (i.e. combinations of Lot Codes, Date Codes, etc.). Both forward and backward traceability shall be available. Supplier must be able to execute traceability inquiries within a target turn-around time is 48 hours or less. Traceability If required, Buyer will provide information to Supplier on what identification items are required on the Product label.

4.9 Non-Conforming Material

The Supplier shall establish procedures for the control, identification, segregation, review, evaluation, and disposition of Nonconforming Material or Defective Products. This includes both material returned from the Authorized Third Party and field, as well as within the Supplier's process. Supplier shall allocate separate holding areas for nonconforming or defective materials, to prevent use in the manufacture of the Product and subsequent shipment or return to Buyer. This procedure will include the following items:

1. Reporting method to management and/or subcontractors
2. Failure Analysis (FA) team, procedures, turn around time, and facilities
3. Corrective Action implementation
4. Customer feedback loop/customer involvement

Definitions of Nonconforming Material or Defective Products shall be defined in the Agreement.

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4.9.1 Root Cause Analysis and Corrective Action

Supplier's responsibilities for Non-conforming Materials or Defective Products will be defined in the Agreement. Supplier shall assure containment of Nonconforming Material and Defective Products to avoid escape to Buyer and its Authorized Third Parties or its Customers. Supplier shall allocate separate holding areas for nonconforming materials, to prevent use in the manufacture of Product. Supplier shall notify Buyer in writing, and present to Buyer within a prompt but reasonable time frame, the root cause analysis and corrective action (via an 8D report or similar) in the process and quality systems to prevent recurrence. (Reference JESD671 for description of 8D reports and overall process.) At a minimum, the following items shall be addressed:

1. Defining the root cause of the defect or non-conformance
2. Providing an explanation of how the defective part(s) escaped the supplier's process
3. Providing target dates for the implementation of corrective actions
4. Providing a detailed analysis of the controls implemented to prevent reoccurrence of the defect
5. Supplier must show corrective action will be implemented across all similar processes making similar parts

Buyer may require the Supplier to perform 100% inspection of the product at the supplier's location (prior to shipment) or at Buyer's Location, and at the Supplier's expense, until a root cause analysis and corrective action report is mutually agreed upon. Buyer shall not unreasonably delay or withhold approval of such report.

5 Process / Product / Engineering Change Controls

5.1 Control of Parts

Supplier shall maintain documentation to identify all "work in process" (WIP) including the referenced Specification for each WIP item. Supplier shall have controls in place to control the possibility of down-level and/or returned parts being mixed with good stock. Unless otherwise agreed to by the parties, the FIFO (First-In, First-Out) inventory control methodology shall be used.

5.2 Document Control

All documents required for the production or testing of the Product such as software/firmware, engineering drawings, specifications, contracts, policies, procedures, manufacturing process flow chart, and work instructions (including test procedures) shall be under revision control and shall be made available to all necessary personnel in the manufacturing environment. Supplier shall have a system for the effective updating/removal of any obsolete documentation from all manufacturing areas and its storage in accordance with a reasonable records retention program.

5.3 Supplier Change Notification to IBM

Unless specifically agreed to the contrary, Supplier shall notify and obtain written approval from Buyer using the PCN (Process Change Notification) process, REA (Request for Engineering Action) process, or other mutually agreed to method, prior to any changes to the Product. These changes include:

- Manufacturing site location change*
- Tooling change/addition/removal (encompasses tooling design or method change), including changes to fixtures, gages and test equipment
- Process flow change (such as alternating a sequence of operations, adding or deleting an operation or inspection), including any chemical, mechanical or process changes which could affect the performance, reliability, safety, serviceability, appearance, dimension, tolerances*
- Design change driven (portions controlled by the supplier)
- Packaging change*
- Test/inspection change
- Test code change
- Code / Firmware Change
- Component AVL/BOM/COL change, material source change*

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- Process (assembly or repair) chemical change*
Note: Additional PCN requirements may be specified in the commodity PQA

*If a change to the product, process, or manufacturing location may result in a change in the environmental compliance reporting requirements per Section 11.2.1 of this specification, an updated Product Content Declaration form (46C3484) must be provided to Buyer. Supplier shall Notify IBM of all PCNs for Supplier products if IBM or IBM's sub-contractor has ever purchased the Supplier's product using the IBM part number (PN), even if the product was last purchased more than 2 years ago.

For all changes that do not require advance Buyer approval of the change, Supplier shall use reasonable efforts to promptly notify Buyer of such change(s).

Other requirements for written approval of changes may be set forth in the mutually agreed Specifications or Product Supplements to this document. Buyer reserves the right to reject any change that requires Buyer's approval. Buyer's remedies, if any, for any unapproved changes will be set forth in the Agreement.

5.3.1 Re-qualification:

Following Buyer's initial qualification of the Product, any changes to the Product that require Buyer's approval may require re-qualification of the Product. As a condition of such approval and where mutually agreed, Buyer may request reimbursement of Buyer's reasonable costs of such re-qualification.

5.4 Supplier Engineering Change (EC) Process Control Requirements

Supplier's Engineering Change process must be documented. EC definition shall include (but not be limited to) any chemical, mechanical or process changes to the product, proposed by IBM or supplier, which would affect the performance, reliability, safety, serviceability, appearance, dimension, tolerances, or composition of BOM or material sources.

Suppliers are required to build product to the specifications and Bill of Materials (BOMs) released in the EC document. Any deviation from that BOM requires a documented approval from IBM.

5.5 Supplier Process Control Requirements

The Supplier shall have process controls in place to prevent unintentional or accidental process changes from being made.

5.6 Engineering and Process Documentation Requirements

The engineering and process documentation must have a PDM (Product Data Management) type system of engineering change control. The PDM system shall include a BOM for all products / parts, and the Supplier will maintain access for Buyer to the latest revision of the BOM, regardless of who controls the master document and its content. All parts referenced in the BOM that are managed by Supplier will be identified and will have an engineering drawing, specification or equivalent. All parts referenced in the BOM that are managed by other companies, such as Buyer specified parts or commercially available items, will also have an engineering drawing, specification or equivalent available through the PDM System.

5.6.1 Tooling Documentation Requirements

All process and tooling documentation (including fixtures and gauges) shall be maintained and referenced to the revision level of their associated parts and assemblies in the BOM.

5.7 Product Discontinuance / End of Life (EOL)

The Supplier's ability to discontinue a product during the term of the applicable Purchase Agreement will be determined in accordance with the applicable Purchase Agreement. If there is no existing SOW or Purchase Agreement or product discontinuance requirements are not state therein, Suppliers shall conform to the requirements stated in J-STD-048.

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Additionally, Supplier shall Notify IBM if IBM or IBM's subcontractor has ever purchased the Supplier's Product using the IBM PN, even if the product was last purchased more than 2 years ago. This is an additional requirement, since IBM may not have been considered an "Affected Customer" per J-STD-048.

6 Acceptance of Final Product by IBM

6.1.1 Part to Print

All Supplier shipments to Buyer or Authorized Third Parties, shall be on a part-to-print, defect-free basis irrespective of any sampling plans by the Supplier to verify product quality prior to shipment. With the exception of any parts purchased from Buyer, Supplier shall be responsible for managing quality of their Product and any products purchased from Subcontractors and Material Suppliers.

6.1.2 Defective Products

Supplier's responsibilities for Defective Products, and Buyer's remedies for Defective Products shall be specified in the Agreement. The Supplier shall not ship any Product that is known to be non-conforming without prior written approval.

6.2 On-Site Support

Where defect levels exceed the committed quality rates, and upon Buyer's request, the Supplier shall provide on-site support to perform sorting, failure analysis, and corrective action reporting. This on-site support shall be continuous until the defect level of the Products is determined to be within the committed quality rates for a sustained period as determined by Buyer.

Where mutually agreed to by Buyer and Supplier, continuous On-Site Support will be provided by the Supplier at the Buyer's or Authorized Third Party's location(s) to perform sorting, failure analysis, and corrective action reporting. Specific requirements will be identified in the Agreement, SOW, or as otherwise mutually agreed to in writing.

7 Stop Ship / Stop Build Procedures

7.1 Quality Problem Notification to IBM

The Supplier shall notify IBM, and any impacted Authorized Third Parties of any quality, reliability or safety problems which may affect the Products in any way irrespective of the source of such identification. This notification must include any problems identified by other Supplier customers on the same or similar products and where the cause of such problems may potentially apply to Buyer's Product. This notification shall include reported problems at Supplier customer sites. If other Supplier customers' have instituted stop shipments, subject to any confidentiality obligation Supplier has with its customers, the problem notification shall include the nature of such stop shipments. IBM reserves the right to stop ships or stop build at the Supplier's manufacturing site(s) due to any issues that affect IBM production yields or customer quality.

7.2 Problem Communication

A formal process must be established to notify Buyer of problems.

7.3 Problem Resolution

Stop ships and stop builds shall be treated with maximum urgency, and will not be lifted until mutual agreement has been reached for the root cause and corrective actions are in place. As such, Supplier shall provide immediate technical support in order to find the root cause and provide containment actions. The working notes involved in resolution of problems shall be recorded in the SPL (or other mutually agreed to methodology), along with root cause explanations, corrective actions and material disposition.

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7.4 Product Disposition

Supplier shall ensure that no quality compromise will be made when suspected Defective or Non-conforming Product are being dispositioned. There shall be no shipment of suspect Products to Buyer or Authorized Third Parties without Buyer's Approval.

7.5 Supplier Quality Impact Dashboard (SQID) Process

The Supplier Quality Information Dashboard (SQID) is an internal dashboard used across the Systems Supply Chain Engineering (SCE) and STG Development executive teams to monitor key supplier quality issues and concerns. This dashboard summarizes a variety of key quality metrics: field repair actions, critical customer quality situations, installation quality defects, first-pass yield data, pre-stop ship and stop shipment data. These various metrics and quality data are analyzed and root cause analysis performed. When suppliers are found to be responsible for the quality defects they are promptly notified. Furthermore, Systems SCE, along with Procurement, collaborate closely on issue resolution with suppliers.

In addition to the creation of this dashboard, suppliers with defects that hit the SQID are color-coded overall as "Red" or "Yellow". The distinction between these two ratings is provided below. Once any product division within a supplier's company is identified as "Red" on SQID, the company is placed on a 6 month probation period where they will be blocked from new business unless the procurement sourcing councils gain VP level exception agreement from the following three functions: a) Procurement Sourcing, b) Systems SCE, and c) STG Development. A supplier will remain RED until no new impacts have occurred for 6 consecutive months from the date "unrestricted" solution with the corrective action are received by IBM. This can be new, fixed or screened parts from the supplier -- as long as there is no restriction and meets all quality requirements for shipment. This does not include a workaround by IBM. The 6 month probation period will reset in the event of another problem.

Red suppliers will move to Yellow status after the 6 month probation period. Once on Yellow, VP approval is no longer required for new business. Suppliers will remain on yellow status for 6 months under the condition that there are no new quality problems during this 6 month period.

The determination of a "Red" or "Yellow" overall SQID rating is subjective and the Buyer may change these criteria, or the SQID process, from time to time at its sole discretion. . However, below is the current internal guidance used by the Systems SCE Client Quality team.

Red

- Major Impact(s) affecting IBM and/or Clients. Impact to manufacturing or field on a larger scale
- One Major and/or Multiple problems indicating poor Supplier Quality Management System.
- Pervasive Manufacturing or Field Impact: Very large group of Manufacturing Sites and/or Clients affected
No Root Cause / Corrective Action Plan in place or existing plan not showing improvement

Yellow

- Significant Impact(s) affecting IBM and/or Clients.
- One or more Medium problems affecting IBM and/or Clients. Problem believed to be one-off or process escape.
- Isolated Manufacturing or Field Impact. Impact can be segregated at Manufacturing or affected Clients.
- Root Cause / Corrective Action plan in place. Plan may or may not be showing improvement at present time.

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8 Quality Goals, Continuous Improvement and Reporting

8.1 Quality Goals / Commitments

The ultimate goal is defect free product from a controlled process. The quality and reliability performance requirements will be documented in a Product Quality Addendum or other methods as determined by Buyer. Included, as examples, will be expected Shipped Product Quality Level (SPQL) and reliability requirements.

8.2 Continuous Improvement

The Supplier shall have a continuous improvement plan to both achieve agreed to quality goals/commitments. IBM strives for double-digit quality improvement in our products year over year. In order to support our product goals, IBM suggested best practice for suppliers is a minimum 10% improvement in quality performance year over year unless otherwise stated in the SQD/PQA. For each improvement activity, the following information must be documented:

Description of the activity

The objective of the activity

Progress checkpoint dates and the target date for completion of the activity

Projected quality levels at checkpoints and upon completion of activity

Detailed information (i.e. root cause analysis, implementation phase-in dates, effectiveness assessment methodology, etc.) supporting individual actions for continuous improvement shall be included.

8.2.1 Quality Techniques

The Supplier shall use continuous improvement techniques to establish, maintain and improve quality. These techniques will be used in all stages of product life (i.e., design, qualification, ongoing production, and end of life production). The list of techniques will vary depending upon the stage of product life and quality performance.

Some examples of techniques include but are not limited to the following. Buyer and Supplier will mutually agree upon the techniques needed for a specific application, as required.

1. Fault Tree Analysis
2. Failure Modes and Effects Analysis (FMEA)
3. Gage Repeatability and Reproducibility Studies
4. Capability Analysis
5. Affinity / Ishikawa Diagrams

8.3 Quality Reporting

8.3.1 Periodic Summary Reporting

Buyer may require regular quality reporting, usually monthly. The Product Quality Addendum shall include specific reporting requirements and intervals.

8.3.2 Quality Metric Listing

The Supplier will maintain a summary table of all key measurements, definitions, frequency of reporting, goals, and continuous improvement targets.

8.4 Quality Analytics

As IBM adopts a ‘Cognitive’ supply chain approach in their business operation and empowers future automation and data exchange in manufacturing technologies (Industrie 4.0). IBM Supply Chain Engineering (SCE) team is rolling out the following quality analytics initiatives in order to align with future supply chain requirements.

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8.4.1 VAI (Value Added Information) and VAI (Value Added Information) Plus

VAI/VAI Plus is defined as parts or products description as well as parametric information of every IBM procured commodities that shall be used for quality analytics. Upon request by Buyer, the Supplier will submit these files on weekly basis (at minimum) electronically to a location designated by IBM personnel upon Buyer request. Data file formatting requirements will be defined in the commodity PQA.

8.4.2 Predictive Alerts/Triggers

Data analytics is an integral component of IBM's Supply Chain commodities quality performance monitoring tool. The tool(s) will provide a regular monthly report of "field quality health level" of all commodities shipped from every supplier. The reports may be shared with a Supplier, to collaboratively drive a proactive quality investigation.

9 Audits

9.1 Audits and Inspection by IBM

Buyer shall have the right, subject to any agreed confidentiality obligations, to audit a Supplier's design, support, or manufacturing site that produces Product for Buyer as required. Alternatively, supplier personnel may be trained as auditor based on IBM audit methodology. The auditor may be leveraged to supplement IBM audit requirements at Buyer's discretion. Buyer can also inspect the Product at any stage during development or production. Buyer will provide reasonable notification to the Supplier of its intent to audit or to inspect product. Supplier documents relevant to the Product quality will be provided to Buyer for review upon Buyer's request.

Buyer's inspection of Product does not relieve the Supplier's responsibility to furnish Product that meets the agreed to Specifications. Buyer reserves the right to reject any Product that is found to be Non-conforming or Defective subsequent to inspection at source by Buyer.

9.2 Subcontractor Audit

This right to audit and inspect extends to Subcontractors or Material Suppliers, and shall be subject to any limitations in the agreements between the Supplier and their Subcontractors or Material Supplier.

9.3 Supplier Self Audits

The Supplier shall document and maintain a program of internal auditing to ensure continuing control and compliance to the procedures utilized to meet the requirements of this Document. Information regarding the results and corrective actions of self audits shall be made available to Buyer upon request. All audit results are to be retained by the Supplier for a minimum of 3 years.

9.3.1 Roving Audits

As an alternative to a full work-scope audit, Buyer and Supplier may selectively identify mutually agreed items for auditing by Supplier. These items may be determined by quality history, prior audit results, best practices, or other means.

10 Quality Records

Supplier shall establish and maintain procedures for identification, collection, indexing, filing, storage, maintenance, and disposition of all quality records. As examples, these records may include raw data or control charts, Cp and Cpk for critical/identified process parameters, and records of all inspection and test activity to provide objective evidence that products have passed acceptance criteria. Records shall be maintained for time periods as agreed to between the Supplier and Buyer. A listing of all quality records, with the retention period defined, must be maintained. Product Quality Addendums may contain additional requirements regarding the management of quality records.

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11 Standard Compliance Requirements

11.1 External Standard Requirements

When referenced as a requirement in the Agreement, SOW, or Specification; independent lab requirements (i.e., UL, CSA, ISO – International Organization for Standardization, etc.) shall be met and proof of any required approvals shall be maintained. Upon request, Buyer shall be provided a list of the products that require this level of control and the methods used to assure product compliance (i.e., UL, certificate of compliance, independent lab analysis, etc). Agency inspections and results shall be made available to Buyer upon request. Ongoing agency inspection results and files shall be maintained in accordance with the document, data, and quality record control guidelines.

11.1.1 ISO 9000

Supplier shall be, and shall remain ISO 9001 compliant. Compliance can be either external accreditation or self-declaration. For external accreditation, a copy of the Supplier's current registration is required. For self-declaration, Supplier shall provide Buyer with a letter of assurance from Supplier's CEO/COO or other Officer of Supplier that self-declaration was done with due diligence based upon a previously executed internal audit report, and has had executive management review and approval.

11.2 IBM Standards Requirements

When referenced as a requirement in the Agreement, SOW, or Specification; specific IBM Standards requirements shall be met. These may include, but not be limited to Safety Standards, Country of Origin (COO), Shipping, Packaging, Labeling and Environmental Standard requirements.

11.2.1 Environmental Requirements

Product shall comply with environmental requirements stated in IBM environmental specification 46G3772 and any other applicable environmental specifications. Supplier shall have a process in place to provide and communicate the necessary physical Product content / composition information to IBM. In addition, to ensure environmental compliance, the Supplier shall have a process that can verify the physical Product content / composition information of their Product and their subcontractor's Product.

- Link to IBM environmental specification 46G3772, any of it's corresponding engineering specifications and Product Content Declaration form:
<http://www-03.ibm.com/procurement/proweb.nsf/ContentDocsByTitle/United+States~Information+for+suppliers>

11.2.2 Supply Chain Social Responsibility

- Supplier shall establish and maintain policies and practices that ensure conformance to either the IBM Supplier Conduct Principles or the EICC Code of Conduct.
 - IBM Supplier Conduct Principles:
<http://www-03.ibm.com/procurement/proweb.nsf/ContentDocsByTitle/United+States~Supply+chain+social+responsibility>
 - EICC Code of Conduct:
<http://www.eicc.info/EICC%20CODE.htm>

11.2.3 Shipping to IBM and Authorized Third Parties

The Supplier shall package and ship all Product per the mutually agreed Specifications.

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12 Equipment Control

12.1 Calibration Requirements

The process for calibrating manufacturing and inspection equipment such as CNC (Computerized Numerical Control) machines, spot welders, ovens, wave solder, verniers, torque tools hardness testers, dielectric strength, DVM's (Digital Voltmeter), ICT (In-Circuit Test), FCT (Functional Card/Component Test) and vibration test equipment, etc. shall be defined and documented by the Supplier. As part of the calibration requirements, Supplier shall maintain records of the equipment calibrated, equipment labeling, calibration processes used, and the frequency of calibration.

12.2 Equipment Maintenance

Supplier shall document the process used for equipment maintenance, including preventive maintenance records, scheduling, identification, and storage and shall perform maintenance in accordance with such plans.

12.3 New Equipment Capability

A process for integrating new equipment and technology into the Supplier's operations shall be documented. Where appropriate, and when Supplier is requesting permission from Buyer to use new equipment or technology in the production of the Product, such request shall include:

- The number and duration of consecutive successful trials required prior to declaring the equipment qualified
- The potential effect of the new equipment or technology on other required manufacturing operations, including those sub-contracted
- How manufacturing operations (including subcontracted manufacturing operations) will be evaluated
- The expected timetable for updating all required quality plans, machine maintenance files, operator training plans, calibration schedules, etc.

Additional requirements for use of new equipment or technology in the production of the Product may be included in the Product Quality Addendum.

12.4 Buyer Owned Tooling

For any loaned Buyer owned tooling, the parties will execute a separate loan agreement that sets forth the responsibilities, and restrictions on use of such tools. All loaned Buyer owned capital tooling shall have assigned Buyer tool numbers. As part of any quality audits, and in addition to any rights Buyer may have under the loan agreement, Buyer may audit the Buyer owned tooling at Supplier's location.

12.5 ESD

The Supplier shall have ESD controls, materials and procedures in place that are reasonable for the Product(s) being produced against damage due to electrostatic discharge. All personnel that have direct contact with the Product or any portion thereof must be trained in ESD handling techniques and where appropriate, must wear wrist straps and clothing made specifically for avoiding a build up of electrostatic charge. Compliance to ANSI/ESD S20.20 or IEC 61340-5-1 will meet all the requirements of an effective ESD control program. While certification by third party is proof of standards compliance and recommended, it is not required.

13 Training and Workmanship

Supplier shall provide initial and periodic training to manufacturing, test, and quality assurance personnel to ensure a skilled and effective workforce.

13.1 General Requirements

General training, such as computer fundamentals, component identification, component/commodity handling techniques, and electrostatic discharge (ESD) control shall be provided to all manufacturing and test personnel. Training that is specific to the

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Product, or is required of the personnel building that Product, and any related training documents, shall be documented and shall be provided to all personnel manufacturing the Product for Buyer. Safety training specific to job requirement shall be provided. Periodic refresher training shall be provided.

13.2 Training Certification

The Supplier shall maintain certification and de-certification procedures for all production workers. Only those production workers that are certified to the proper level are to be allowed to participate in the manufacturing and test procedures. All production workers are to be re-certified periodically in accordance with the Supplier's documented training program. The Supplier shall maintain a training requirement matrix that outlines the type of training required for certification at each key position within the design and manufacturing process and the status of all workers in achieving such certification including the date of the last certification.

13.3 Workmanship

Supplier shall provide workmanship standards that are subject to Buyers Approval. All production shall utilize either the agreed to or approved standards. The Specification or the Product Quality Addendum may require additional or more stringent standards.

14 IT Toolsets

Where required as part of the Specification or Product Quality Addendum, the following toolsets are used to communicate product, process, and quality data to IBM.

1. **SQMS2** The SQMS2 (Supplier Quality Management System) enables collection of product quality information from Suppliers and the Buyer or Authorized Third Party manufacturing lines, providing two-way communication on quality performance. Suppliers can access the data to track how their components or parts are performing in Buyer's products and get feedback to help them improve quality.
2. **PCN** (Process Change Notification) is an end-to-end system that records incoming change requests from a supplier, alerts consuming brands, and returns requirements data to the supplier. This greatly reduces miscommunication, contributes to higher quality by providing control over part changes, and improves engineering change turnaround.
3. **QIN** (Quality Information Network) is a database of information used to monitor supplier performance. When either a new or existing supplier is being evaluated, the tool can provide the auditor information on previous or scheduled audits before a visit to the supplier site is planned. If the audit trip is deemed justified, it can be scheduled and the findings documented in QIN. Other engineers in any division worldwide can then access the information, saving both supplier and IBM time and money that might otherwise be expended in multiple visits and evaluations of a single supplier.
4. **SPL** (Supplier Problem Log) tracks quality issues by supplier. This management tool provides a comprehensive and structured approach to problem tracking from reporting through resolution. The tool also is a central information repository for commodity quality issues throughout the enterprise..

15 Buyer's Qualification of Products

Buyer's qualification of Products for use in Buyer's products, shall in no way relieve the Supplier of responsibility for any Products that are Defective or Non-conforming. Any Buyer test of the Product will not test all fail modes.

16 Related Documents

16.1 Product Quality Addendum (PQA)

The "Product Quality Addendum" is an optional document, provided by Buyer to the Supplier that sets forth additional Product and quality specific requirements.

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16.2 Supplier Quality Document (SQD)

The “Supplier Quality Document” is an optional document, provided by the Supplier to the Buyer that documents any or all of the following, as applicable:

- Supplier’s commitments and methods to meet all quality requirements of the SQRD Documents and the PQA.
- Buyer Approved Waivers.
- Specification exceptions.
- Supplier’s Quality and Reliability Commitments.

16.3 Referenced Documents and Standards

ISO9001	Quality Management
46G3772	Baseline Environmental Requirements For Supplier Deliverables to IBM
46C3484	Product Content Declaration for IBM Suppliers
JESD671-A	Component Quality Problem Analysis and Corrective Action Requirements
J-STD-048	Notification Standard for Product Discontinuance
ANSI/ESD S20.20 ESD	Association Standard For the Development of an Electrostatic Discharge Control Program for – Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)
IEC 61340-5-1	Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements

17 Acronyms

ANSI	American National Standards Institute (added)
AVL	Approved Vendor List
BOM	Bill of Material
CDA	Confidential Disclosure Agreement
CNC	Computerized Numerical Control
CPL	Components Placement List
COL	Change of Location
CSA	Canadian Standards Association
DVM	Digital Voltmeter
ECAT	Electronic Card Assembly and Test
EC	Engineering Change (Notice)
EEPROM	Electrically Erasable Programmable Read-Only Memory
EICC	Electronic Industry Citizenship Coalition
ESD	Electro Static Discharge
E2E	End to End
ETN	Equivalent to New
FA	Failure Analysis
FCT	Functional Card/Component Test
FIFO	First-In, First-Out Inventory Control
ICT	In-Circuit Test
ISO	International Organization for Standardization
MAC	Media Access Control (Address)

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MPQA	Master Product Quality Agreement
PCN	Process Change Notice
PDM	Product Data Management (System)
PQA	Product Quality Addendum
QIN	Quality Information Network
REA	Request for Engineering Action
SCP	Supplier Conduct Principles (IBM)
SCSR	Supply Chain Social Responsibility
SOW	Statement of Work
SPL	Supplier Problem Log
SPC	Statistical Process Control
SPQL	Shipped Product Quality Level (aka IQL)
SQD	Supplier Quality Document
SQMS2	Supplier Quality Management System 2
UL	Underwriter's Laboratories
TQA	Technology Qualification Application

18 Document Change History

EC	Date	Comments
H14017	21 JUNE 05	Initial Release
H14017A	1 JULY 07	<p>Section 2: Definitions and Acronyms</p> <p>Added "SQD" (Supplier Quality Documents) to definitions</p> <ul style="list-style-type: none"> • Clarified definitions / usage of SQD and PQA (also see Section 17 "Related Documents") • Deleted PQA Addendum (Old Section 20) <p>Moved Section 4.4 (Product Quality Addendum) from June 21, 2005 version to Section 17 "Related Documents"</p> <p>Section 5.3: Manufacturing Process Measurement:</p> <ul style="list-style-type: none"> • Removed language that implied process parameters must be specified in IBM drawings or specifications - they are typically defined in a PQA <p>Section 5.6: Sub-Tier Procurement Requirements:</p> <ul style="list-style-type: none"> • Added requirement to ensure sub-tiers achieve environmental (spec) compliance <p>Section 6.4: Supplier EC Process Control</p> <ul style="list-style-type: none"> • Added language that clarified - supplier must build to current EC level and deviations require documented approval from IBM <p>Section 8 (Shipping and Packaging) from June 21, 2005 version removed and moved to Section 12 (see below)</p> <p>Section 9.1: Quality Goals / Commitments (was Section 10 in June 21, 2005 version)</p> <ul style="list-style-type: none"> • Clarified that product goals are specified in either PQA or "other methods as determined by (IBM)" • Added Section 9.2.1 "Quality Techniques" to strengthen requirement for supplier to have continuous improvement programs and appropriate improvement techniques. "Example techniques" provided are "Six Sigma" tools, but we do not explicitly require their use.

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		<p>Section 12: Standard Compliance Requirements</p> <ul style="list-style-type: none"> • Renamed - was "Independent Lab Certifications" (Section 13) in June 21, 2005 version • Added general statement on Standards: When referenced as a requirement in the Agreement, SOW, or Specification; specific IBM Standards requirements shall be met. These may include, but not be limited to Safety Standards, Country of Origin (COO), Shipping, Packaging, Labeling and Environmental Standard requirements. • Added specific Environmental Requirement: To ensure environmental compliance, the Supplier shall have a comprehensive verifiable physical Product composition verification / compliance process for their Product and their subcontractors Product. • Section 8 (Shipping and Packaging) from June 21, 2005 version moved here, and renamed "Shipping to IBM and Authorized Third Parties" <p>Section 15: IT Toolsets (was Section 16 in June 21, 2005 version)</p> <ul style="list-style-type: none"> • Deleted reference to TQA (Technology Qualification Application) IT toolset. <p>Section 17: Related Documents</p> <ul style="list-style-type: none"> • Renamed - was "Supplier Quality Document (Section 18) in June 21, 2005 version • Clarified purpose of PQA and SQD: <ol style="list-style-type: none"> 1) PQA (Product Quality Addendum) The "Product Quality Addendum" is an optional document, provided by Buyer to the Supplier that sets forth specific quality requirements for a Product including technical, and / or quality goals for the Product and any exceptions to this SQRD Document. Note: PQA template was removed from this document to minimize confusion with our suppliers. 2) SQD (Supplier Quality Document) The "Supplier Quality Document" is an optional document, provided by the Supplier to the Buyer that documents any or all of the following, as applicable: <ul style="list-style-type: none"> • Supplier's commitments and methods to meet all quality requirements of the SQRD Documents and the PQA. • Buyer Approved Waivers / Specification exceptions. • Supplier's Quality and Reliability Commitments.
H1407B	18 December 08	<p>Section 8.2 : Continuous Improvement</p> <ul style="list-style-type: none"> • Revised paragraph on continual improvement to reflect the T&M 105 instruction Corporate Quality Initiative of 10% improvement. (IBM strives for double-digit quality improvement in our products year over year. In order to support our product goals, IBM suggested best practice for suppliers is a minimum 10% improvement in quality performance year over year unless otherwise stated in the SQD/PQA)
H1407C	15 August 11	<p>Cover Page</p> <ul style="list-style-type: none"> • Revised paragraph Changed the document owner's name, document approval's name and department's name. <p>Definitions</p> <ul style="list-style-type: none"> • Added the definition of "EICC", "Supplier Conduct Principles" and "Supply Chain Social Responsibility" <p>Section 4.6 : Sub-Tier Procurement Requirements</p> <ul style="list-style-type: none"> • Added Supplier Chain Social Responsibility Compliance to ensure Supplier and its sub-contractors shall follow the social responsibility

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		<p>compliance.</p> <p>Section 5.4 : Supplier Engineering Change (EC) Process Control</p> <p>Requirements</p> <ul style="list-style-type: none"> • Replaced the information of “Suppliers are required to build product to the specifications and Bill of Materials (BOMs) released in the EC document. Any deviation from that BOM requires a documented approval from IBM.” to “Once an EC has broken in (BIPed) at the supplier plan, that supplier location shall not build down level EC product for that P/N without a documented approval from IBM.” <p>Section 11.2.1 : Environmental Requirements</p> <ul style="list-style-type: none"> • Added language that clarified – supplier must follow the environmental compliance. • Added “Section 11.2.2 Supplier Chain Social Responsibility” and specified that “Supplier shall establish and maintain policies and practices that ensure conformance to either the IBM Supplier Conduct Principles or the EICC Code of Conduct.” <p>Section 13.1 : General Requirements</p> <ul style="list-style-type: none"> • Added to ensure “Safety training specific to job requirement shall be provided.” <p>Section 17 : Acronyms</p> <ul style="list-style-type: none"> • Added “EICC”, “E2E”, “SCP” and “SCSR”
D77341	30 April 12	<p>Section 5.3 : Supplier Change Notification to IBM</p> <ul style="list-style-type: none"> • Added “ Code / Firmware Change”
D77341A	25 Feb 13	<p>Section 7.5 : Supplier Quality Impact Dashboard (SQID) Process</p> <ul style="list-style-type: none"> • Added “Supplier Quality Impact Dashboard (SQID) Process
N83451	5 December 16	<p>Cover Page</p> <ul style="list-style-type: none"> • Changed the document owner’s name, document approval’s name, and owning organization. <p>Definitions</p> <ul style="list-style-type: none"> • Added the definition of “Agreement” • Clarified the definition of “Product” <p>Section 4.1 : Manufacturing Process Qualification</p> <ul style="list-style-type: none"> • Clarification of shipment requirements relative to the manufacturing process qualification <p>Section 4.5 : First Piece Build and Inspection Requirements</p> <ul style="list-style-type: none"> • Redefined the section so that the requirement is now “When specifically requested and upon mutual agreement” <p>Section 4.6 : Sub-Tier Procurement Requirements</p> <ul style="list-style-type: none"> • Clarification of responsibility; Supplier is required to manage both Buyer & Non-Buyer specified suppliers, pursuant to section 4.6 <p>Section 4.6.1 : Sub-Contractor and Material Supplier Selection</p> <ul style="list-style-type: none"> • Clarification of requirement <p>Section 4.8 Product Identification and Lot Traceability</p> <ul style="list-style-type: none"> • Additional traceability capability requirements <p>Section 4.9 Non-Conforming Material</p> <ul style="list-style-type: none"> • Clarification of shipment requirements relative to non-conforming material <p>Section 4.9.1 : Root Cause Analysis and Corrective Action</p> <ul style="list-style-type: none"> • Added the requirement that root cause & corrective action reports are be provided to the Buyer in an 8D format (or similar)

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		<p>Section 5.3 : Supplier Change Notification to IBM</p> <ul style="list-style-type: none"> • Added environmental reporting requirements relative to change notifications (as applicable) • Added notification requirements for products with IBM PNs • Notation added to indicate that additional requirements for approval of changes may be specified in mutually agreed Specifications or Product Supplements to this document <p>Section 5.3.1 : Re-qualification</p> <ul style="list-style-type: none"> • Redefined the section so that the requirement is now “where mutually agreed” <p>Section 5.7 : Product Discontinuance / End of Life (EOL)</p> <ul style="list-style-type: none"> • New sub-section; Notification and management requirements for product discontinuance <p>Section 6.1.2 : Defective Products</p> <ul style="list-style-type: none"> • Added the requirement that “Supplier shall not ship any Product that is known to be non-conforming without prior written approval.” <p>Section 7.3 : Problem Resolution</p> <ul style="list-style-type: none"> • Clarification of the requirement: “Stop ships and stop builds... will not be lifted until mutual agreement has been reached for the root cause..” <p>Section 8.4 : Quality Analytics</p> <ul style="list-style-type: none"> • New section; Requirements for quality data • New sub-sections 8.4.1 and 8.4.2 <p>Section 9.1 : Audits and Inspection by IBM</p> <ul style="list-style-type: none"> • Notation added that introduces the concept that Supplier personnel may be trained as an auditor on IBM audit methodology to supplement IBM audit requirements <p>Section 9.3 : Supplier Self Audits</p> <ul style="list-style-type: none"> • Added retention requirements for self-audits <p>Section 9.3.1 : Roving Audits</p> <ul style="list-style-type: none"> • New sub-section detailing roving audits <p>Section 11.2.3 : Shipping to IBM and Authorized Third Parties</p> <ul style="list-style-type: none"> • Clarification of requirement <p>Section 12.5 : ESD</p> <ul style="list-style-type: none"> • Update to the reference ESD document and clarification of requirement <p>Section 16.1 : Product Quality Addendum (PQA)</p> <ul style="list-style-type: none"> • Clarification of document definition and use <p>Section 16.2 : Supplier Quality Document (SQD)</p> <ul style="list-style-type: none"> • Clarification of document definition and use <p>Section 16.3 : Referenced Documents and Standards</p> <ul style="list-style-type: none"> • New sub-section; List of documents and standards
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